

Ch.S.D.St.Theresa's College for Women (A), Eluru

BOARD OF STUDIES DEPARTMENT OF ENGLISH

The Boards of Studies meeting was held on Monday 06.02.2023 at 2.00 p.m. in the English Department. The members who attended were:

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.P.Gopi Chand, Head of the Dept. of English, J.K.C. College, Guntur

External experts:

3. Prof.K.Sree Ramesh, Dept. of English, Adikavi Nannaya University, Rajamahendravaram.

Faculty:

4. Dr.Mrs.R.Madhavi
5. Dr.Mrs.D.Fatima Rani
6. Dr.D.Rajani Deivasahayam
7. Mrs.M.K.Padmalatha
8. Mrs.K.Beulah Swarupa
9. Ms.D.Mani Bhagya Sri
10. Mrs.G.Durga Vyshnavi

Students:

11. V.Sharon, III B.A. EPSW
12. R.Mahima Rani, III B.A. EPSW
13. D.Sukurthi, I B.A. EPSW

Resolutions:

- For the II year General English Syllabus Semester III it was resolved to include Professional Skill Unit comprising of Short presentations skills and Classroom presentations skills.
- It was resolved that Data Interpretation Unit would be added to Semester III , General English syllabus comprising of interpretation of pie charts, bar graphs, tree diagrams, Line charts, flow charts and graphs.
- It was resolved that the Department would collaborate with the following institutions such as IILM, IECE, and Edu Skills for internships which enable employability in Semester IV.
- It was resolved to offer a Certificate Course English for Competitive Exam for II year Degree Students in Semester III.

- It was resolved by the Board to offer “Training in IELTS/TOEFL to Advanced Learners in lieu of the General English course. This course will be offered through online/offline mode and would earn the learners equal credits.

CH.S.D. ST. THERESA'S COLLEGE FOR WOMEN (A), ELURU

తౌలుగు శాఖ 2022-2023

గౌరవనీయులైన ఎకడమిక్ కౌన్సిల్ సభ్యులందరూ ది.17-6-2022 తేదీ శుక్రవారం నాడు ఉదయం 10.30 నాల్గకు తౌలుగు శాఖ పాఠ్యం శాస్త్రీణాయక మండలి అంతర్జాల సమావేశంలో మేము తీసుకున్న తీర్మానములను మేము ముందుంచుటకు దయచేసి అనుమతించవలసిందిగా కోరుతున్నాను.

సభ్యులు :

1. డా॥వీ. అరుణ కుమార్, తౌలుగు అధ్యక్షులు, ప్రియదర్శిని ప్రింటర్నింగ్ డిగ్రీ కళాశాల, నాంపల్లి.
2. డా॥ కాండారవి, తౌలుగు శాఖాధ్యక్షులు, ఎస్. ఏ. ఎస్ కళాశాల నారాయణపరం.

తౌలుగు శాఖ సభ్యులు :

1. శ్రీమతి. డాక్టర్ :సి. హాచి. వీ. మహాలక్ష్మి తౌలుగు మరియు హిందీ

శాఖాధ్యక్షురాలు:

2. శ్రీమతి. బి. మరయమ్మ
3. శ్రీమతి వై. అరుణ ఝాన్సీరాణి
4. శ్రీమతి. డాక్టర్. కౌ. అరుణ
5. శ్రీమతి ఎన్. భవానీ

వోద్యార్థులు :

1. ఎమ్. భువనశ్రీ | B.A (HTP)
2. పి. తేజశ్రీ || BA (HTP)

తీర్మానములు

- మొదటి తీర్మానము : 2022-2023 వోద్యోగ సంవత్సరమునకు జనరల్ తౌలుగు ప్రియ, ద్వితీయ సంవత్సర వోద్యోగినిని మొదటి సెమిస్టర్ ప్రియ కవితవము, రెండవ సెమిస్టర్ ఆధునిక కవితవము, మూడవ సెమిస్టర్ సృజనాత్మక రచన అను అంశాలను పాఠ్యంశాలుగా అనుసరిస్తాము.
- రెండవ తీర్మానము: సోపానల్ తౌలుగు ప్రియ, ద్వితీయ సంవత్సర వోద్యోగినినిని పాత సెలబ్స్ నే అనుసరిస్తాము.
- మూడవ తీర్మానము : సోపానల్ తౌలుగు తృతీయ సంవత్సర వోద్యోగినినిని 5 వ సెమిస్టర్ ప్రియ 6 తౌలుగు భాషా సోపానము, ప్రియ 7 తౌలుగు రచనా రీతులు పాఠ్యంశాలుగా అనుసరిస్తాము.

DEPARTMENT OF HINDI

The Boards of Studies meeting was held on Saturday, 04.02.2023 at 20.00 p.m. in the Department of Hindi.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.K.Sumithra, Department of Hindi, Sir C.R.R. College (A), Eluru

External expert:

3. Dr.K.Neeraja, Associate Professor in Hindi, S.K.R.College for Women, Rajamahendravaram

Faculty:

4. Dr.Mrs.Ch.V.Mahalakshmi
5. Mrs.Sk. Rahamathunnisa

Students:

6. Lipi Ananya, III BBA
7. Ashwarya, III B Sc

Resolutions:

- Semester I Unit-III Grammar: It was resolved that instead of Change the Voice, we introduce Sandhi Vichched in I Semester, as the students are familiar with Sandhi Vichched which they studied in Intermediate level.
- Semester II Unit-III Grammar: The Board suggested to continue with Change the Voice, because Sandhi Vichched was shifted to I Semester.
- Semester III Unit-I Modern Poetry: It was resolved to keep Maanav poem written by Sumithranandan Panth in Semester III instead of Bharath Maatha as the Board suggested to keep one Patriotic Poem and one Social Awareness Poem.

DEPARTMENT OF ECONOMICS

The Boards of Studies Meet was held on Tuesday, 07.02.2023 at 2.30 p.m. in the Social Science Department.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Prof.K.Madhubabu, Dept. of Economics, Acharya Nagarjuna University, Guntur

External expert:

3. Mr.M.Rambabu, Lecturer in Economics, Government Degree College, Eluru

Faculty:

4. Dr.Mrs.P.Ratna Mary
5. Ms.N.Mounika

Students:

6. P.Mahima, I B.A.HEP EM
7. M.Keertana Joseph, II B.A.HEP EM

Resolutions:

- It was resolved to continue the existing syllabus of III to V semesters for the academic year 2023-2024.
- It was resolved to include self Help group's- DWACRA as an add on course for the II B.A H.E. P students in III semester for the year 2023-2024.

DEPARTMENT OF HISTORY

The Boards of Studies meet was held on Saturday, 04.02.2023 at 2.00 p.m. in the Department of Social Sciences.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.M.Hari Prasad, Lecturer in History, YVNR Govt. Degree College, Kaikaluru.

External experts:

3. Dr.G.Beulah Pearl Sunanda, Head of the Dept.of History, Maris Stella College (A), Vijayawada

Faculty:

4. Dr.Mrs.Esther Kalyani
5. Ms.G.M.V.Ratna Kumari
6. Mrs.P.Anusha

Students:

7. V.Sravanthi, I B.A.HEP EM
8. P.Anusha, II B.A. HEP EM

Resolutions:

1. It was resolved to include Map Pointing for 4 (four) marks in the Semester end examination for all the History courses.
2. It was resolved to include 'Ancient Civilizations' as an Add-on course in the III Semester for the year 2023-24.

DEPARTMENT OF POLITICS

Minutes of the meeting of the Boards of Studies in Politics was held on Monday, 06.02.2023 at 2.00 p.m. through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.G.David Living Stone, Dept. of Politics, Annapurna Degree College, Ganapavaram.

External experts:

3. Dr.K.S.V.Ranga Rao, Associate Professor in Politics, Sri Y.N. College, Narsapur.

Faculty:

4. Mrs.R.Chittemma
5. Ms.Y.Sailaja

Students:

6. M. Anjali, I B.A.HEP (EM)
7. K. Hema Prasantha, II B.A. HEP(EM)

Resolutions:

1. It was resolved to follow the existing syllabus of III to V semesters for the academic year 2023-24.
2. It was resolved to include “Women in Politics” as an add on Course for the II.B.A HEP & HTP students in III Semester for the year 2023-24.

DEPARTMENT OF PSYCHOLOGY

The Psychology Boards of Studies meeting was held on Monday, 06.02.2023 at 10.00 a.m. through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.D.Rajyalakshmi, Dept. of Psychology, St.Joseph's College for Women (A), Visakhapatnam.

External experts:

3. Mr.G.Rakesh, Dept. of Psychology, Govt. Degree College (A), Rajamahendravaram

Faculty:

4. Mrs.G.M.R.Josephine

Students:

5. P.Megana Sri, I B.A. EPSW
6. Sd.Mubeena, II B.A. EPSW

Resolutions:

- It was resolved to continue the existing syllabus of II to V semesters for the academic year 2023 to 2024.

DEPARTMENT OF SOCIAL WORK

The Boards of Studies meet in Social Work was held on Saturday, 04.02.2023 at 10.00 in the Department of Social Sciences.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.R.Janaki Rao, Dept. of Social Work, Adikavi Nannaya University, Rajahmahendravaram

External experts:

3. Dr.R.Srinivas, Dept. of Social Work, Acharya Nagarjuna University Campus, Ongole.

Faculty:

4. Dr.M.Esther Kalyani
5. Ms.K.Kusuma Kumari

Students:

6. M.Likitha, I B.A. EPSW
7. P.Hima Sai Teja Aswini, II B.A. EPSW

Resolutions:

The Board reviewed the syllabus and the following resolutions were made .

- It was resolved to add Gender Inequalities in Unit III and Child Nutrition in Unit V in Semester III.
- It was resolved to add the topic Case Studies in Unit III of Paper VI in Semester V.
- It was resolved to add the topics Problems of Disability and Institutional and Non-Institutional Services for Disability in Unit IV of Paper VI B in Semester V.

DEPARTMENT OF COMMERCE

The meeting of the Boards of Studies in Commerce was held on Saturday, 04.02.2023 at 2.00 p.m. in the Department of Commerce..

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.T.Vijaya Babu, Dept. of Commerce & Management, KBN College (A), Vijayawada

External experts:

3. Sri G.Srikanth, Chartered Accountant, Eluru

Faculty:

4. Dr.R.S.N.Sarma
5. Mr.S.B.V.Subrahmanyam
6. Mrs.R.Jagadeeswari
7. Mrs.R.Harika

Students:

8. T.Bavya Charitha, III B.Com. Computers
9. K.Spandana, III B.Com. General

Resolutions:

1. It was resolved to add one more Unit on each Paper according which students are required to do practical on the content related to that particular Paper. Record is to be submitted by them.
2. It was resolved to continue the Elective Paper in V Semester, Sales Force and Digital marketing for III B.Com. Computer students and Stock markets and Service Marketing for III B.Com. General students.
3. It was decided to continue Certificate Course Tally in V Semester for B.Com. General students.
4. It was resolved to send III B.Com. students in VI Semester on Tax Practice.

DEPARTMENT OF MATHEMATICS

Board of Studies meeting in Mathematics was held on Saturday, 04.02.2023 at 2.00 p.m. in the Mathematics Department.

MEMBERS:

1. Dr.Sr.Mercy P., Principal

University Nominee:

2. Dr.G.S.V.S.Sai Baba, Head of the Dept. of Mathematics, Sri Y.N.College (A), Narsapur.

External experts:

3. Dr.A.Satyanarayana, Head of the Dept. of Mathematics, Sri DNR GDC for Women, Palakollu.

Faculty:

4. Sr.M.Suseela
5. Mr.V.Gopinath
6. Mrs.P.Poojitha
7. Mrs.G.Jyothi
8. Mrs.P.Rajitha
9. Mrs.K.Harika

Students:

10. Sk.Ameena, III B.Sc M.P.Computers
11. P.Pallavi, II B.Sc. MPComputers

Resolutions:

1. The Board proposed to continue the existing syllabi of II to V semesters for the academic year 2023-24.

DEPARTMENT OF STATISTICS

The meeting of the Board of Studies in Statistics was held on Saturday, 04.02.2023 at 2.00 p.m. through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.N.Srinivasa Rao, Lecturer in Statistics, Andhra Loyola College (A), Vijayawada

External experts:

3. Dr.N.Madhavi, Head of the Dept. of Statistics, Govt. Degree College (A), Rajahmundry

Faculty:

4. Mrs.G.Kusuma
5. Mrs.R.Sravani

Students:

6. U.Lakshmi Jahnavi, II B.Sc. M.St.Comp.
7. M.Sonika , II B.Sc. M.St.Comp.

Resolutions:

The Board resolved that

- The Present syllabi of II & III B.Sc. Statistics were reviewed. After thorough discussion the board proposed to follow the same for the academic year 2023 - 24.

DEPARTMENT OF B.Sc. COMPUTER SCIENCE:

The meeting of the Boards of Studies in Computer Science was held on Thursday, 09.02.2023 at 10.00 a.m. in the Department of Computer Science.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.Suneel Kumar Duvvuru, HOD, Dept. of Computer Science, Government Degree College, Rajahmundry.

External experts:

3. Mr MVDV Prasad, Head of the Dept. of Computer Sc. Sir C.R.R.College (A), Eluru
4. Mr.D.Anil Kumar, Software Engineer, Sampath Infotech.Pvt.Ltd, Eluru

Faculty:

5. Mrs.K.L.L.Lavanya
6. Mr.Md.Sharif
7. Mr.P.Srinivas
8. Mrs.G.Radhika
9. Ms.G.Divya
10. Ms.Ch.Sai Leela Rani

Students:

11. B.Padma Sri Lakshmi, III B.Sc. M.P.Comp.
12. T.Chandana, II B.Sc. M.B.Comp.

Resolutions:**Dept of B.Sc :**

1. It was resolved to modify Unit – I in “Problem solving in C” in Semester I – Instead of General fundamentals, to add number system and typing skills. Remaining all the subjects in Semester I,II,III and IV will be retained without any changes.
2. It was resolved to modify Unit II in data Science in Semester V – It is proposed to concentrate on practical more than a theoretical approach. Remaining all the papers in V Semester will be retained without any changes.
3. It was resolved to conduct at least one guest lecture and a workshop in the next academic year.
4. It was resolved to organize value added certificate courses to Non-computer students in the next academic year.

DEPARTMENT OF B.COM. COMPUTERS:

The meeting of the Boards of Studies in Computer Science was held on Thursday, 09.02.2023 at 10.00 a.m. in the Department of Computer Science.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.Suneel Kumar Duvvuru, HOD, Dept. of Computer Science, Government Degree College, Rajahmundry.

External experts:

3. Mr MVDV Prasad, Head of the Dept. of Computer Sc. Sir C.R.R.College (A), Eluru
4. Mr.D.Anil Kumar, Software Engineer, Sampath Infotech.Pvt.Ltd, Eluru

Faculty:

5. Mrs.K.L.L.Lavanya
6. Mr.Md.Sharif
7. Mr.P.Srinivas
8. Mrs.G.Radhika

Students:

9. L.Mary Florence, I B.Com Comp.
10. T.Bhagya Charitha, III B.Com. Comp

Resolutions:

1. It was resolved to modify Unit – I of “Information Technology” in Semester I – to add typing skills and MS-Word instead of computer basics and to elaborate the syllabus of MS-EXCEL for the benefit of students.
2. It was resolved to increase the programs for practical in HTML for “E-Commerce and Web designing” in Semester II.
3. It was resolved to merge the V and VI Units of the paper sales force in V Semester.

DEPARTMENT OF PHYSICS & ELECTRONICS

The meeting of the Boards of Studies in Physics & Electronics was held on Saturday, 04.02.2023 at 2.00 p.m. in the Physics Department.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominees:

2. Dr.S.Rajyalakshmi, Dept. of Physics, Adikavi Nannaya University, Rajamahendravaram.
3. Dr.B.Balaji Bhanu, HOD, Dept. of Electronics, Andhra Loyola College(A), Vijayawada.

External experts:

4. Dr.Ch.Srinivasa Rao, Dept. of Physics, Andhra Loyola College (A), Vijayawada
5. Sri V.Ratna Sekhar, HOD, Dept. of Electronics, D.N.R. College (A), Bhimavaram.

Faculty:

6. Dr.Mrs.A.Nirmala Jyothsna
7. Dr.K.Sreelatha
8. Mrs.M.Saraswathi
9. Mrs.A.Anantha Lakshmi
10. Ms.K.Sreelekha
11. Ms.N.Madhuri Rose

Students:

1. A.Durga Bhavani, III B.Sc.M.P.C.
2. K.Likhitha, III B.Sc.M.P.C.
3. M.Renuka Devi, III B.Sc. M.E.Cs.
4. S.Nirmala Swaroopa, III B.Sc. M.E.Cs.

Resolutions:

Physics

1. It was resolved to follow the existing syllabus for II to VI Semesters as it is.

Electronics

1. It was resolved to follow the existing syllabus for II to VI Semesters as it is.

DEPARTMENT OF CHEMISTRY

The meeting of the Board of Studies in Chemistry was held on Saturday 04.02.2023 at 2.00 p.m. through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.Chenna Rao Devarapalli, Asst. Professor in Chemistry, P.R.Government College (A), Kakinada.

External experts:

3. Dr.K.Rayappa Reddy, Dept. of Chemistry, Andhra Loyola College (A), Vijayawada.
4. Mr.G.Narendra, Shree Icon Pharmaceuticals, Vijayawada. (Industrialist)

Faculty :

5. Dr.C.A.Jyothirmayee
6. Dr.Mrs.M.Rama
7. Dr.Mrs.V.Nagalakshmi
8. Dr.K.Swarna Latha
9. Dr.Mrs.N.Gayatri Devi
10. Mrs.K.J.Subhashini
11. Ms. N.Madhavi
12. Mrs.B.Sruthi Rajkamal

Student representatives :

13. P. Priyanka III B.Sc.MPC
14. P.Cherishma, III B.Sc. BZC

Resolutions:

After thorough discussions with the University nominee and Subject expert, the Board resolved the following:

It is resolved that:

1. The syllabi of I to V Semesters is apt and that both Theory and Practical syllabus will be followed for the academic year 2023-2024 with minor changes.
2. Difference between AAS and flame Photometry, Qualitative and quantitative analysis, calibration curve and standard addition method are added to the Unit- V of SEC – 7B in Semester – V.
3. It is resolved to encourage students to register for online Swayam courses.
4. To encourage Research culture, the students can be advised to download the Research articles of their choice for Project selection under the guidance of faculty members and also to have subject internships at the end of II year in collaboration with Pharma laboratories.

DEPARTMENT OF BOTANY

The Boards of Studies meeting in Botany was held on Saturday 04.02.2023 at 2.00 p.m. in the Department of Botany.

Members:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.B.Siva Kumari, HOD, Dept. of Botany, Andhra Loyola College (A), Vijayawada

External experts:

3. Mrs.U.Suseela, Lecturer in Botany, SDM Mahila Kalasala, Vijayawada

Faculty:

4. Dr.Mrs. BBRG. Vijaya Lakshmi.
5. Mrs.G.Rani

Students:

6. N.Anusha, III B.Sc. BZC
7. D.Lavanya, II B.Sc BZC

Resolutions:

1. It was decided to follow the guidelines as per the APSCHE for the I year admitted Degree students 2023-24.
2. It was resolved to follow the existing syllabus of Theory and practical for a semester III, IV, V & VI without any changes for the academic year 2023-2024, as it is updated with skill-oriented topics, provide employability & Entrepreneurship opportunities and is relevant to the needs of the society.

DEPARTMENT OF ZOOLOGY

The meeting of the Boards of Studies in Zoology was held on Saturday, 04.02.2023 at 2.00 p.m. in the Zoology Department..

MEMBERS:

1. Dr.Sr.Mercy P., Principal

University Nominee:

2. Dr.V.Sandhya, Asst. Professor, Dept. of Zoology, Government Degree College, Kaikaluru

External experts:

3. Dr K.Visweswara Rao, HOD, Dept. of Zoology, Sir C.R.R. College (A), Eluru

Faculty:

4. Dr.Mrs.R.Indira
5. Dr.S.Pratima Kumari
6. Dr.Mrs.K.S.V.K.S.Madhavi Rani
7. Mrs.N.L.Prasanna

Students:

8. L.Roshina, III B.Sc. BZC
9. B.Krupa Deepika, III B.Sc. BZC

The Board of Studies members revised the I,II and III B,Sc Zoology syllabus Semester wise, model question papers, Add-On Courses, Value added Courses, internships, project works, MOOCS, and Skill Development courses- Environmental Education and made the following resolutions.

Resolutions:

- It was resolved to continue the existing syllabus without any changes for the II & III B.Sc.
- It was resolved to introduce Sericulture as Value added Course for the final years in their VI Semester as it is relevant to impart basic knowledge and skill based and self employable.
- **Skill Development courses for Biology stream- Environmental Education: II B.Sc:** It was resolved to continue the same syllabus for Environmental Education in III Semester as Skill Development Course for the academic year 2023-2024.
- It is resolved to introduce B.Sc honors 4 year integrated course. the first year syllabus will follow as per the guidelines of APSHE.

DEPARTMENT OF HOMESCIENCE

Meeting of the Board of Studies in Home Science was held on Saturday, 04.02.2023 at 2.30 P.m. in the Home Science Department through online.

Members:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.Y.Lakshmi Prabha, St.Joseph's College for Women (A), Visakhapatnam.

External Expert:

3. Mrs.G.Sucharitha, Dept. of Garment Technology, Govt. Polytechnic College for Women, Guntur.

Faculty:

4. Dr.Mrs.M.Padmaja
5. Mrs.P.S.Bhanu Prasanna
6. Ms.T.Jhansi Lakshmi
7. Ms.B.Suneela

Students:

8. A.Harika, II B.Sc. H.Sc.
9. M.Shreaya, II B.Sc. H.Sc

Resolutions:

After thorough review of the syllabus the board felt that syllabus is satisfactory and hence suggested to continue during the forthcoming academic year. It was decided to follow the APSCHE syllabus for Semesters VII &VIII.

DEPARTMENT OF NUTRITION & DIETETICS

The meeting of the Boards of Studies in Nutrition & Dietetics was held on Saturday, 04.02.2023 at 2.00 p.m. through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.K.V.Santhi Sri, Associate Professor, Dept. of Food Science, Nutrition & Dietetics, Acharya Nagarjuna University, Gudur.

External Expert:

3. Dr.G.Anitha, Asst. Professor in Home Science, ASD Govt. Degree College for Women, Kakinada.

Faculty:

4. Dr.Mrs.P.Jyothi Kumari
5. Mrs.B.Radha
6. Mrs.G.N.V.S.Navya

Students:

7. S.Anuhya, III B.Sc. MBN
8. Farha Tabasum, III B.Sc. ZNC

Resolutions:

- It was resolved to follow syllabus given by the APSCHE as a single major for the admitted batch 2023-2024.
- For the II & III years also the existing APSCHE given syllabus will be followed.

DEPARTMENT OF MICROBIOLOGY

The meeting of the Boards of Studies in Microbiology was held on Friday, 03.02.2023 at 2.00 p.m. in the Microbiology Department through online.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.T.Sujatha, Lecturer in Microbiology, Government Degree College (A), Rajamahendravaram.

External experts:

3. Mrs.R.Sakuntala, Lecturer in Microbiology, D.N.R. College (A), Bhimavaram.

Faculty:

4. Dr.Mrs.A.Padmavathi
5. Dr.Mrs.Y.Neeraja

Students:

6. S.Jahnavi, II B.Sc., MBN
7. G.Sai Anusha,II B.Sc., MBComp.

Resolutions:

- It was resolved to follow the existing syllabus for the III and V Semesters as it is.

DEPARTMENT OF BIOCHEMISTRY

The meeting of the Boards of Studies in Biochemistry was held on Saturday 04.02.2023 at 2.00 p.m. in the Biochemistry Department.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.E.A.V.V.Rambabu M, Lectuer in Biochemistry, B.V.Raju College, Bhimavaram

Subject Expert:

3. Ms.D.Madhuri Devi, Lecturer in Biochemistry, ABN & PRR Degree College, Kovvur.

Faculty:

4. Dr.A.Padmavathi
5. Dr.Y.Neeraja
6. Ms.V.Lalitha Pavani
7. Mrs.M.Stella

Students:

8. Shaik Salma, III B.Sc. M.B.N.
9. V.Pavani, II B.Sc. M.B.C.

Resolutions:

- It was resolved to follow the existing syllabus for the III and V Semesters as it is.

DEPARTMENT OF B.SC. VISUAL COMMUNICATION

The meeting of the Boards of Studies in Visual Communication was held on Thursday, 09.02.2023 at 10.00 a.m. in the Department of Computer Science.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.Suneel Kumar Duvvuru, HOD, Dept. of Computer Science, Government Degree College, Rajahmundry.

External experts:

3. Mr MVDV Prasad, Head of the Dept. of Computer Sc. Sir C.R.R.College (A), Eluru
4. Mr.D.Anil Kumar, Software Engineer, Sampath Infotech.Pvt.Ltd, Eluru

Faculty:

5. Mrs.K.L.L.Lavanya
6. Mrs.G.Radhika
7. Ms.G.Divya
8. Ms.Ch.Sai Leela Rani

Students:

9. K.Jyothi, II B.Sc. Visual Communications.

Resolutions:

- It was resolved to add “Adobe Flash” and “Anchoring” subjects instead of “Media research methods” and “Public Relations” in Semester V.

B.VOC CLINICAL & AQUA LAB TECHNOLOGY

The meeting of the Boards of studies in B.Voc, CALT for Aqua papers was held on 17.02.2023 at 2 Pm to review the I, II and III year B.Voc Clinical and Aqua Lab technology to restructure the syllabus, if required.

MEMBERS:

1. Dr. Sr.Mercy.P, Principal

University Nominee:

2. Dr.V.Sandhya, Assistant Professor, GDC. Kaikaluru

External experts:

3. Sri K.Visweswara Rao, Sir C.R.R. Autonomous College, Eluru

Faculty:

4. Dr.Mrs.R.Indira
5. Dr.S.Pratima Kumari
6. Dr.Mrs.K.S.V.K.S.Madhavi Rani
7. Mrs.N.L.Prasanna

Students:

8. Ms. Roshita, III B.Sc. BZC
9. Ms. Krupa Deepika, II B.Sc, BZC
10. Ms. Preethi, I B.Voc, CALT

The Board of Studies members revised the I, II and III B.Voc, Clinical and Aqua Lab Technology semester wise, model question papers, Field Trips, project works, MOOCS and NSDC Exam certification and made the following resolutions.

- It was decided to revise the papers thoroughly for II and IV semesters and the members scheduled the internship in VI semester.
- The syllabus was framed in such a way that once they complete the course, they can take up a job in industries/Institution. It is a vocational course with multiple entry and exit facility with 100% employability and entrepreneurship facility.

B. Voc (Web Technology and Multimedia)

The meeting of the Boards of Studies in Web Technology & Multimedia was held on Thursday, 09.02.2023 at 10.00 a.m. in the Department of Computer Science.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Mr.Suneel Kumar Duvvuru, HOD, Dept. of Computer Science, Government Degree College, Rajahmundry.

External experts:

3. Mr MVDV Prasad, Head of the Dept. of Computer Sc. Sir C.R.R.College (A), Eluru
4. Mr.D.Anil Kumar, Software Engineer, Sampath Infotech.Pvt.Ltd, Eluru

Faculty:

5. Mrs.K.L.L.Lavanya
6. Mr.P.Srinivas
7. Mrs.G.Radhika
8. Ms.G.Divya
9. Ms.Ch.Sai Leela Rani

Students:

10. K.Arthika Sravani, II B.Voc. WTM

Resolutions:

1. It was resolved to retain all the papers in Semester-I without any changes
2. It was resolved to change the subject to “Data structures with C” instead of “Object oriented program with C++”, Remaining all subjects in semester II and III will be retained without any changes.
3. It was resolved to delete the “Mini Project” from IV semester and replace with PHP-Programming I” .
4. It was resolved to offer in V semester the following changes:

Lab Training Project instead of mini projects and After Effects Video Editing instead of Z Brush Modelling, After Effects audio editing instead of Z Brush Texturing, PHP-Programming II instead of Sales force CRM.

DEPARTMENT OF B.B.A.

The meeting of the B.B.A. Boards of Studies was held on Saturday 04.02.2023 at 2.00 p.m. in the Department of Management Studies. The following members were present for the meeting.

MEMBERS:

1. Dr.Sr.Mercy P, Principal

University Nominee:

1. Dr.R.Pardhasaradhi, HOD, Dept. of Management Studies, Sri Y.N.College (A), Narsapur

External experts:

2. Dr.G.Malathi, Associate Professor, Dept. of Business Administration, Maris Stella College (A), Vijayawada.

Faculty:

3. Dr.Mrs.Santosh Jhawar
4. Mrs.P.Vijayalakshmi
5. Mrs.G.Hephzibah Beulah
6. Mrs.Mohini R

. Students:

7. Ch.Kyathi, II B.B.A.
8. Md.Rida Juveria, I B.B.A.

Resolutions:

- It was resolved to introduce Add-on Courses carrying 2 credits.
 1. **Tally with GST in III Semester** for the admitted batch of 2022.
- It was resolved to assign 2 credits to the qualified Final year students in 100 hrs - Certificate Program in Banking, Finance & Insurance (CPBFI) in V Semester in collaboration with Bajaj Finserv.

DEPARTMENT OF AGRICULTURE & RURAL DEVELOPMENT

The Boards of Studies meeting in Agriculture & Rural Development was held on Saturday 04.02.2023 at 2.00 p.m. in the Department of Botany.

Members:

1. Dr.Sr.Mercy P, Principal

University Nominee:

2. Dr.B.Siva Kumari, HOD, Dept. of Botany, Andhra Loyola College (A), Vijayawada

External experts:

3. Mrs.U.Suseela, Lecturer in Botany, SDM Mahila Kalasala, Vijayawada
4. Dr.P.Lakshmana Swamy, Head, Dept. of Agricultural Science, Maris Stella College (A), Vijayawada

Faculty:

5. Dr.Mrs. BBRG. Vijaya Lakshmi.
6. Ms.Ch.Lakshmi Deepika
7. Mr.V.Siva Nagireddy
8. Mr.K.Ravi Kumar

Students:

9. K.Jaya Phani Sri, I B.Sc. Agriculture

Resolutions:

- After thorough review it was resolved to adopt revised Common Programme structure as per the guidelines issued by APSCHE and Indian Council of Agricultural Research for B.Sc Agriculture & Rural Development.
- It was resolved to follow the ICAR 5th Dean syllabus of Theory and Practicals for Semesters I, II, III, and IV for the academic year 2022-23 admitted batch.
- It was resolved to include Skill Development Course, Organic Manure Production and Bio-pesticides in I Semester to enhance the employability.
- It was resolved to take-up “Identification of Local Crops and marketing problems” as Community Service Project after the II Semester
- It was resolved to include Skill Development Course, Mushroom Cultivation in II Semester as an Entrepreneurial Course.

*CH.S.D.ST. THERESA'S
AUTONOMOUS COLLEGE FOR
WOMEN: ELURU*

SYLLABUS – 2022-2023

DEPARTMENT OF ENGLISH

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A), ELURU.

DEPARTMENT OF ENGLISH – PAPER TITLES

GENERAL ENGLISH SYLLABUS

SEMESTER – I	Communication and Soft Skills
SEMESTER – II	Reading & Writing Skills
SEMESTER - III	Conversational Skills

SYLLABUS FOR ADVANCED ENGLISH

SEMESTER – I	PAPER I -- INTRODUCTION TO LITERATURE
SEMESTER – II	PAPER II -- INTRODUCTION TO ENGLISH LANGUAGE AND LITERATURE
SEMESTER – III	Paper III ---BRITISH POETRY AND DRAMA
SEMESTER – IV	Paper IV A-- BRITISH PROSE AND NOVEL
SEMESTER – IV	Paper IV B— GLIMPSES OF WORLD LITERATURE
SEMESTER – V	PAPER – V- INDIAN ENGLISH LITERATURE (Prose & Poetry)
SEMESTER - V	PAPER VI -AMERICAN ENGLISH LITERATURE (Prose & drama)
SEMESTER- VI	PAPER VII- INDIAN ENGLISH LITERATURE (Drama& novel)

CLUSTERS

SEMESTER- VI	PAPER VIII A1 – AMERICAN ENGLISH LITERATURE (POETRY & NOVEL)
PAPER VIII A2	FUNCTIONAL ENGLISH
PAPER VIII A3	CREATIVE WRITING

BBA –

SEMESTER-I	Communication skills – I
SEMESTER-II	Communication Skills – II
SEMESTER-III	Professional English & Soft Skills – I
SEMESTER-IV	Professional English & Soft Skills – II

B.VOC-

I SEMESTER	COMMUNICATION SKILLS IN ENGLISH-I
II SEMESTER	Communication Skills English-II
III SEMESTER	COMMUNICATION & SOFT SKILLS-I

SKILL DEVELOPMENT COURSES for B.A

I SEMESTER	PUBLIC RELATIONS
II SEMESTER	JOURNALISTIC REPORTING
III SEMESTER	DISASTER MANAGEMENT

III B.VOC (WEB TECHNOLOGY AND MULTIMEDIA)

VI SEMESTER	PROFESSIONAL SKILLS
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DEPARTMENT OF ENGLISH- SYLLABUS -2022-2023

For U.G. for B.A , B.Com. B.Sc, H.Sc

GENERAL ENGLISH SYLLABUS--SEMESTER – I

Communication and Soft Skills

Course Objectives:

- To Introduce students to Paragraph and Essay writing
- To Introduce students to English speech sounds, stress & Syllabification
- To make students competent in different formats of formal correspondence with clarity & precision.
- To teach students basic grammar
- To introduce students to value oriented Anecdotes based on which dramatization, dialogue writing, short presentations, and reported speech can be taught.
- To introduce students to Communicative Skills through values.

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> Listening Skills	Listening Skills i. Importance of Listening ii. Types of Listening iii. Barriers to Listening iv. Effective Listening	<u>UNIT I</u> Life Skills	Anecdotes of the Great: (From J. Maurus- Anecdotes of the Great) i. Atheist ii. Bonhomie iii. Bravery iv. Brotherhood v. Charity vi. Creativity vii. Discipline viii. Encouragement ix. Example x. Family
<u>UNIT II</u> Speaking Skills	Speaking Skills a. Sounds of English: Vowels and Consonants b. Word Accent c. Intonation	<u>UNIT II</u> Speaking & Listening Skills	Speaking Skills a. Sounds of English: Vowels /Consonants /Diphthongs b. Word Accent & Intonation c. Syllables & Silent letters

<p><u>UNIT-III</u></p> <p>Grammar</p>	<p>Grammar</p> <p>a) Concord b) Modals c) Tenses (Present/Past/Future) d) Articles e) Prepositions f) Question Tags g) Sentence Transformation (Voice, Reported Speech & Degrees of Comparison) h) Error Correction</p>	<p><u>UNIT-III</u></p> <p>Grammar</p>	<p>A)Grammar</p> <p>a) Tenses (Present/Past/Future) b) Concord c) Prepositions d) Articles e) Error Correction</p>
<p><u>UNIT IV</u></p> <p>Writing</p>	<p>i. Punctuation ii. Spelling iii. Paragraph Writing</p>	<p><u>UNIT IV</u></p> <p>Writing</p>	<p>i. Punctuation ii. Spelling iii. Paragraph Writing</p>
<p><u>UNIT V</u></p> <p>Soft Skills</p>	<p>Soft Skills</p> <p>a. SWOC b. Attitude c. Emotional Intelligence d. Telephone Etiquette e. Interpersonal Skills</p>	<p><u>UNIT IV</u></p> <p>Soft Skills</p>	<p>Soft Skills</p> <p>a. SWOC b. Attitude c. Emotional Intelligence d. Telephone Etiquette e. Interpersonal Skills</p>

Pedagogy: Lecture, Group work, pair work, PPT's, Quiz, Role play, Assignments, Practical work, English Laboratory sessions.

Assignment: Preparation of Scrap Book and Writing of Autobiography .

References: Wren. P.C & Martin- "High School English Grammar Competition" 2000, Chand & Co.,M .Banerjee - Introduction to Grammar,New Delhi

"Communication and Softskills" – Text book for Degree Students compiled by Department

DEPARTMENT OF ENGLISH – GENERAL ENGLISH SYLLABUS
SEMESTER – II
Reading & Writing Skills

Course Objectives:

- To orient students towards women related-issues through Parables and life stories
- To introduce students to communication skills
- To make students competent in skills of job application, official correspondence etc
- To make students learn different forms of English texts through audio, video, PPT, role play, Quiz.
- To train students in contemporary vocabulary to promote better reading skills.

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> PROSE SKILLS	1. How to Avoid Foolish Opinions - Bertrand Russell 2. Vocabulary: Conversion of Words 3. One Word Substitutes 4. Collocations	<u>UNIT I</u> PROSE	1. How to Avoid Foolish Opinions - Bertrand Russell 2.The Doll's House - Katherine Mansfield 3.The Night Train at Deoli - Ruskin Bond
<u>UNIT II</u> PROSE POETRY NON-DETAILED TEXT SKILLS	1. The Doll's House - Katherine Mansfield 2. Ode to the West Wind - P B Shelley 3. Florence Nightingale - Abrar Mohsin 4. Skimming and Scanning	<u>UNIT II</u> POETRY	1.Ode To the West Wind- P.B.Shelley 2.Coromandel Fishers - Sarojini Naidu 3.Upagupta - Rabindranath Tagore
<u>UNIT III</u> PROSE POETRY SKILLS	1. The Night Train at Deoli - Ruskin Bond 2. Upagupta - Rabindranath Tagore 3. Reading Comprehension	<u>UNIT III</u> WOMEN'S STUDIES	1. Educated though Illiterate – Fathima Bi 2. Heroes for Today- Indrani Chakravarthi 3. Only A Girl.

<p style="text-align: center;"><u>UNIT IV</u> POETRY SKILLS</p>	<p>1. Coromandel Fishers - Sarojini Naidu 2. Expansion of Ideas 3. Notices, Agendas and Minutes</p>	<p style="text-align: center;"><u>UNIT IV</u> WRITING SKILLS</p>	<p>1. Expansion of Ideas 2. Notices, Agendas and Minutes 3. Curriculum Vitae and Resume 4. Letters</p>
<p style="text-align: center;"><u>UNIT V</u> NON-DETAILED TEXT SKILLS</p>	<p>1. An Astrologer's Day - R K Narayan 2. Curriculum Vitae and Resume 3. Letters 4. E-Correspondence</p>	<p style="text-align: center;"><u>UNIT V</u> READING SKILLS</p>	<p>1. Skimming and Scanning 2. Vocabulary: Conversion of Words 3. One Word Substitutes 4. Collocations</p>

Pedagogy:

Lecture, Comprehension, Quiz, Oral presentations, Slip Tests, Group work

Assignment: Work book, Writing of Brief Biography

References:

- *Wren. P.C & Martin- "High School English Grammar Competition" 2000, Chand & Co.M .Banerjee - Introduction to Grammar,New Delhi*

"Reading and Writing Skills" – Text book for Degree Students compiled by Department

DEPARTMENT OF ENGLISH- SYLLABUS FOR GENERAL ENGLISH

SEMESTER-III

Conversational Skills

Course Objectives:

- To introduce students to formal& informal registers through interviews and speeches.
- To introduce students to read texts and comprehend them.
- To present students women oriented issues that promote debate, discussion and encourage students to respond
- To make the students proficient in Spoken skills--Unit IV &V is dedicated to Speech skills

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT- I</u> SPEECH SKILLS	1. Tryst with Destiny Jawaharlal - Nehru 2. Greetings 3. Introductions	<u>UNIT- I</u> SPEECH SKILLS	1. Women’s Rights are Human rights- Hillary Clinton 2. Yes, We Can - Barack Obama 3. You've Got to Find What You Love - Steve Jobs
<u>UNIT-II</u> SPEECH INTERVIEW SKILLS	1. Yes, We Can - Barack Obama 2. A Leader Should Know How to Manage Failure - Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton 3. Requests	<u>UNIT-II</u> INTERVIEW SKILLS	1. JRD Tata's Interview With T.N.Ninan 2. A Leader Should Know How to Manage Failure - Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton 3. In Fighting for Girl’s Education –Interview of Malala Yousafzai with UN News.
<u>UNIT-III</u> INTERVIEW SKILLS	1. Nelson Mandela's Interview With Larry King 2. Asking and Giving Information 3. Agreeing and Disagreeing	<u>UNIT-III</u> CONVERSATIONAL SKILLS	1. Greetings & Introductions 2. Asking and Giving Information 3. Agreeing and Disagreeing 4. Giving Instructions/Directions 5.Reqests
<u>UNIT – IV</u> INTERVIEW SKILLS	1. JRD Tata's Interview With T.N.Ninan 2. Dialogue Building 3. Giving Instructions/Directions	<u>UNIT – IV</u> SPEAKING SKILLS	1. Dialogue Building 2. Debates 3. Descriptions 4. Role Play

<p><u>UNIT – V</u> SPEECH SKILLS</p>	<p>1. You've Got to Find What You Love - Steve Jobs 2. Debates 3. Descriptions 4. Role Play</p>	<p><u>UNIT – V</u> WOMEN STUDIES for SPEECH SKILLS</p>	<p>1. How I Taught my grandmother to Read 2. Books for at Least one Library. 3. Salaam Abdul Kalam 4. Hassan's Attendance Problem. 5. The Red Rice Granary 6. The Real Jewels. <i>(From Sudha Murthy's-How I Taught My Grandmother to Read)</i></p>
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Assignment: Interviews of Famous Personalities

Pedagogy: Lecture, Comprehension, Quiz, Oral presentations, Slip Tests, Group work, Use of Audio-video lessons,

References:

Wren. P.C & Martin- "High School English Grammar Competition" 2000, Chand & Co.

M.Banerjee - Introduction to Grammar, New Delhi

"Conversational Skills" – Text book for Degree Students compiled by Department

**DEPARTMENT OF ENGLISH –SYLLABUS
FOR ADVANCED ENGLISH**

I YEAR -- SEMESTER – I

PAPER I -- INTRODUCTION TO LITERATURE

Course Objectives:

- To introduce students to types of prose-Narrative, descriptive, reflective.
- To introduce students to point of View, atmosphere and style and narrative technique.
- To introduce students to literary forms.
- To introduce students to write creatively & build stories on given plot & write essays on general topics.
- To introduce students to English language & its development
- To introduce to forms of poetry & aspects of Short stories.

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> TYPES OF PROSE	Forms of Poetry 1. Golden Fruit – A. A. Milne-Descriptive Prose 2. Animal Rights – Arnold Toynbee – Humor in prose 3. On Doing Nothing –J.B. Priestly– Reflective prose(Essays and short notes)	<u>UNIT I</u> TYPES OF PROSE NO CHANGE	1. Golden Fruit – A.A.Milne-Descriptive Prose 2. Animal Rights – Arnold Toynbee – Humor in prose 3. On Doing Nothing –J.B. Priestly– Reflective prose(Essays and short notes)
<u>UNIT II</u> ELEMENTS OF FICTION	1.Point of view- Kush want Singh’s - The Interview 2. Setting and Atmosphere-Edgar Allen Poe’s “The Tell - Tale Heart. 3. Style and Narrative Technique - O. Henry “The Gift Of Magi”	<u>UNIT II</u> ELEMENTS OF FICTION NO CHANGE	1.Point of view- Kush want Singh’s - The Interview 2. Setting and Atmosphere-Edgar Allen Poe’s “The Tell - Tale Heart. 3. Style and Narrative Technique - O. Henry “The Gift Of Magi”
<u>UNIT III</u> LITERARY TERMS	Ballad, epic, Romance, Lyric, Ode, Elegy, Pastoral Elegy, Sonnet, Rhyme, Meter, Mystery/ Miracle play, Morality Play, Metaphysical conceit	<u>UNIT III</u> LITERARY TERMS NOCHANGE	Ballad, epic, Romance, Lyric, Ode, Elegy, Pastoral Elegy Sonnet, Rhyme, Meter, Mystery/ Miracle play, Morality Play, Metaphysical conceit

<p style="text-align: center;"><u>UNIT IV</u> CREATIVE WRITING</p>	<p>1. Story Writing- Hints 2. Essay Writing- General 3. Comprehension from prescribed Prose and Drama Selections</p>	<p style="text-align: center;"><u>UNIT IV</u> CREATIVE WRITING NO CHANGE</p>	<p>1. Story Writing.- Hints 2. Essay Writing- General 3. Comprehension from prescribed Prose and Drama Selections.</p>
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Assignment: Review of Poetry/ Short story
Literary forms-Scrap book

References: 1. *M.H. Abrahams- "A Glossary of Terms"*
2. *W. J. Long- History of English Literature, Oxford University press*
3. *Ages, Movements and literary forms- Dr. Satish Kumar & Dr. Anupama Toyal, Agra.*

Pedagogy: Seminars, Lecture, discussions, preparation of charts, library references, assignments, author review, short story writing, essay writing, PPT, movies.

DEPARTMENT OF ENGLISH –SYLLABUS FOR ADVANCED ENGLISH

I – YEAR -- SEMESTER – II

PAPER II -- INTRODUCTION TO ENGLISH LANGUAGE AND LITERATURE

Course Objectives:

- To introduce students to types of prose-Narrative, descriptive, reflective.
- To introduce students to point of View, atmosphere and style and narrative technique.
- To introduce students to literary forms..
- To introduce students to write creatively & build stories on given plot & write essays on general topics.
- To introduce students to English language & its development
- To introduce to forms of poetry & aspects of Drama

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>Unit - I</u> HISTORY OF ENGLISH LANGUAGE	1.Word formation 2. Semantic Changes 3. Foreign Influences – Latin, Scandinavian, French, Greek, American English	<u>UNIT I</u> HISTORY OF ENGLISH LANGUAGE NO CHANGE	1.Word formation 2. Semantic Changes 3. Foreign Influences – Latin, Scandinavian, French, Greek, 4.American English
<u>UNIT II</u> FORMS OF POETRY	1. Sonnet-scorn not the sonnet ---William Wordsworth. 2. Ode -- “Ode to Autumn” – John Keats 3.Lyric-“ My Love is Like A Red Red Rose” – Robert Burns 4. Ballad- The Ballad of Father Gilligan -- W. B. Yeats 5. Dramatic Monologue- My Last Duchess -- Robert Browning.	<u>UNIT II</u> FORMS OF POETRY NO CHANGE	1. Sonnet-scorn not the sonnet ---William Wordsworth. 2. Ode -- “Ode to Autumn” – John Keats 3.Lyric-“ My Love is Like A Red Red Rose” – Robert Burns 4. Ballad- The Ballad of Father Gilligan -W.B.Yeats 5. Dramatic Monologue- My Last Duchess -- Robert Browning.

<p align="center"><u>UNIT – III</u> FORMS OF DRAMA</p>	<p>1. Character and characterization-The Mother’s Day-- J.B.Priestly</p> <p>2.Dialogue- A Marriage Proposal -- Anton Chekov.</p>	<p align="center"><u>UNIT III</u> FORMS OF DRAMA NO CHANGE</p>	<p>1. Character and characterization-The Mother’s Day-- J.B.Priestly</p> <p>2. Dialogue- A Marriage Proposal -- Anton Chekov.</p>
<p align="center"><u>UNIT IV</u> (A) CREATIVE WRITING</p>	<p>a. Poetry Writing On Given Theme</p> <p>b. Dramatization of a given Passage.(Dialogue Writing)</p>	<p align="center"><u>UNIT IV</u> CREATIVE WRITING NO CHANGE</p>	<p>a. Poetry Writing On Given Theme</p> <p>b. Writing Skits. (Dialogue Writing)</p>
<p align="center"><u>UNIT V</u> (B) LITERARY TERMS</p>	<p>Simile, Metaphor, Personification, Alliteration, apostrophe, Hyperbole, Allegory, Allusion, Anticlimax, Irony, Blank Verse, Tragedy, Comedy, Tragi-Comedy, Character play, Masque, Comedy of Humors, Farce, Denouement</p>	<p align="center"><u>UNIT V</u> LITERARY TERMS NO CHANGE</p>	<p>Simile, Metaphor, Personification, Alliteration, apostrophe, Hyperbole, Allegory, Allusion, Anticlimax, Irony, Blank Verse, Tragedy, Comedy, Tragi-comedy, Masque, Comedy of Humors, Farce, Denouement</p>

Assignment: Poetry writing, Dramatization of passages, Literary forms- Scrap books.

References: *1. History of English Language- A. C. Bough 5th edition*

2. The English Language- C.L. Wren

3. M.H. Abrahams- “A Hand book of literary Terms”

4. Ages, Movements and literary forms-Dr. Satish Kumar, Dr. Anupama Tayal, Agra.

Pedagogy: Seminars, Group discussions, Preparation of Charts, Library references, Assignments, Author review, Poetry Writing, Dramatization of a given Passage.

DEPARTMENT OF ENGLISH –SYLLABUS FOR ADVANCED ENGLISH

II – YEAR -- SEMESTER – III

Paper III ---BRITISH POETRY AND DRAMA

Course Objectives:

- To introduce History of British poetry & types of prose writing
- To introduce students to History of British drama & different elements of drama
- To train students to write creative poems & short skits /dramatizations.
- To train students in History of British Prose and Novel.

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<p><u>UNIT I</u> HISTORY OF LITERATURE POETRY</p>	<p>1. Birth and Development of English Poetry</p> <p>2. Major Poets</p> <p>3. Major Trends and Movements</p>	<p><u>UNIT I</u> HISTORY OF LITERATURE POETRY</p>	<p>1. Birth and Development of English Poetry</p> <p>2. Major Poets : Chaucer, University wits, Spenser, Shakespeare, Milton, Donne, Dryden, Pope,Pre-Romantics,-- Blake, Grey, Goldsmith,The Romantics, The Victorian Poets, T.S. Eliot and W.B Yeats.</p> <p>3. Major Trends and Movements</p>
<p><u>UNIT II</u> POETRY SELECTIONS</p>	<p>1. One day I Wrote her name – Edmund Spenser</p> <p>2. Canonization – John Donne</p> <p>3. The School Boy – William Blake</p> <p>4. How Many Ways Do I Love Thee -Elizabeth Barrett Browning.</p> <p>5. The Rape of the Lock – (Cantos –I) - Alexander Pope.</p>	<p><u>UNIT II</u> POETRY SELECTIONS</p>	<p>1. One day I Wrote her name – Edmund Spenser</p> <p>2. Canonization – John Donne</p> <p>3. The School Boy – William Blake</p> <p>4. How Many Ways Do I Love Thee -Elizabeth Barrett Browning</p> <p>5. The Rape of the Lock – (Cantos –I) - Alexander Pope.</p>

<p style="text-align: center;"><u>UNIT III</u> HISTORY OF LITERATURE DRAMA</p>	<p>1. Birth and Development of English Drama</p> <p>2. Major Dramatists</p> <p>3. Shakespeare's Contribution to Literature.</p>	<p style="text-align: center;"><u>UNIT III</u> HISTORY OF LITERATURE DRAMA</p>	<p>1. Birth and Development of English Drama</p> <p>2. Major Dramatists: Marlowe, Shakespeare, Dryden, Goldsmith, Sheridan Congreve, T.S. Eliot, Barrie, Synge.</p> <p>3. Shakespeare's Contribution to Literature.</p>
<p style="text-align: center;"><u>UNIT IV</u> SELECTED DRAMA</p>	<p>Dr. Faustus – Christopher Marlowe</p>	<p style="text-align: center;"><u>UNIT IV</u> SELECTED DRAMA</p>	<p>Dr. Faustus – Christopher Marlowe</p>
<p style="text-align: center;"><u>UNIT V</u> CRITICAL APPRECIATION</p>	<p>1. Critical appreciation of unseen Poetry/Drama and passage</p> <p>2. Comprehension from the poetry Selections prescribed.</p>	<p style="text-align: center;"><u>UNIT V</u> PRACTICAL CRITICISM and CREATIVE WRITING</p>	<p>1. Critical appreciation of unseen Drama/ poetry passage</p> <p>2. Comprehension from the poetry Selections {prescribed.}</p>
<p style="text-align: center;"><u>UNIT VI</u> LITERARY TERMS</p>	<p>Assonance, Madrigal, Mock heroic, Prosody, Rhyme, Scheme, Dramatic Monologue, Chronicle Play, Chorus, Archetype, Archaism, Soliloquy, Symbol.</p>	<p style="text-align: center;"><u>UNIT VI</u> LITERARY TERMS</p>	<p>Assonance, Madrigal, Mock heroic, Prosody, Rhyme, Scheme, Dramatic Monologue, Chronicle Play, Chorus, Archetype, Archaism, Soliloquy, Symbol.</p>

Assignment: Author/ Poet Review

- Preparation of Charts.
- Writing Short Skits.

Pedagogy: Assignments, Lecture Methods, Preparation of charts, PPT's, Seminars, Pair work, Group dynamics, Library references, Role play, Quiz.

References:

1. *An Introduction to Literature- W. J. Long*
2. *Glossary of literary Terms- M. H. Abrahams*
3. *An Anatomy of Drama- Marjorie Boulton*
4. *An Anatomy of Poetry- Marjorie Boulton*
5. *A Background to the Study of English Literature- B. Prasad Macmillan publishers Ltd.*

DEPARTMENT OF ENGLISH –SYLLABUS FOR ADVANCED ENGLISH

II – YEAR -- SEMESTER – IV

Paper IV A-- BRITISH PROSE AND NOVEL

Course Objectives:

- To introduce History of British poetry & types of prose writing
- To introduce students to history of British drama & different elements of drama
- To train students to write creative poems & short skits /dramatizations.
- To train students in History of British Prose and Novel.

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> HISTORY OF LITERATURE PROSE	1. Birth and Development of English Prose. 2. Major Prose Writers 3. Charles Lamb as an Essayist.	<u>UNIT I</u> HISTORY OF LITERATURE PROSE	1. Birth and Development of English Prose. 2. Major Prose Writers: Bacon, Bunyan, Dryden, Swift, Addison, Steele, Ruskin, Carlyle, Boswell, Lamb, Dr.Johnson, Arnold 3. Charles Lamb as an Essayist.
<u>UNIT II</u> PROSE SELECTIONS	1. Of Youth and Age-Bacon 2. Dream Children-Charles Lamb. 3. Tales from Shakespeare a) Romeo and Juliet b) As you like it c) Macbeth	<u>UNIT II</u> PROSE SELECTION	1. Of Youth and Age-Bacon 2. Dream Children-Charles Lamb. 3. Tales from Shakespeare a) Romeo and Juliet b) As You like It c) Macbeth
<u>UNIT III</u> HISTORY OF LITERATURE NOVEL	1. Rise of the Novel English Novel 2. Major Novelists in English Literature	<u>UNIT III</u> HISTORY OF LITERATURE NOVEL	1. Rise of the English Novel 2. Major Novelists in English Literature: Defoe, Richardson, Smollett, Sterne, Jane Austen, Swift, Hardy, Henry James, Virginia Woolf. D.H Laurence.

<u>UNIT IV</u> NOVEL SELECTIONS	“Pride and Prejudice”- Jane Austen	<u>UNIT IV</u> NOVEL SELECTIONS	“Pride and Prejudice”-Jane Austen
<u>UNIT V</u> CRITICAL APPRECIATION	1. Critical appreciation of passage from prose piece. 2. Comprehension of unseen prose passage b). Writing of paragraph on current issues.	<u>UNIT V</u> PRACTICAL CRITICISM & CREATIVE WRITING	1. Critical appreciation of passage from prose piece. 2. Comprehension of unseen prose passage b). Writing of paragraph on current issues.
<u>UNIT VI</u> LITERARY TERMS	Litotes, Synecdoche, Metonymy, Zeugma, Euphemism, Bathos, Epithet, Epithalamion, Doggerel, Didactic Literature, Cliché, Farce.	<u>UNIT VI</u> LITERARY TERMS	Litotes, Synecdoche, Metonymy, Zeugma, Euphemism, Bathos, Epithet, Epithalamion, Doggerel, Didactic Literature, Cliché, Farce.

Assignment: Review of Novel/ Drama
Literary forms-Scrap book

References: 1. *M.H. Abrahams- “A Glossary of Terms”*
2. *W. J. Long- History of English Literature, Oxford University press*
3. *Ages, Movements and literary forms- Dr. Satish Kumar & Dr. Anupama Toyal, Agra.*

Pedagogy: Seminars, Lecture, discussions, preparation of charts, library references, assignments, author review, short story writing, essay writing, PPT, movies.

DEPARTMENT OF ENGLISH –SYLLABUS FOR ADVANCED ENGLISH

II – YEAR -- SEMESTER – IV

Paper IV B— Glimpses of World Literature

Unit	Module	Topic
I	Poetry	1. Anna Akhmatova: How I Taught Myself to live simple 2. A.D. Hope: The Sacred Way 3. Maya Angelou: Caged Bird
II	Fiction	Nadine Gordimer: July's People
III	Short Story	Tillie Olsen: I Stand Here Ironing Glenda Adams: Lies
IV	Literary Criticism	1. A.D.McKenzie: What is Commonwealth Literature? 2. Chinua Achebe: "An Image of Africa: Racism in Conrad's Heart of Darkness."

Assignment: Review of Poetry/ Short story/Literary Criticism Theory
Literary forms-Scrap book

References: 1. *M.H. Abrahams- "A Glossary of Terms"*
2. *W. J. Long- History of English Literature, Oxford University press*
3. *Ages, Movements and literary forms- Dr. Satish Kumar & Dr. Anupama Toyal, Agra.*

Pedagogy: Seminars, Lecture, discussions, preparation of charts, library references, assignments, author review, short story writing, essay writing, PPT, movies.

IIIrd Year Advanced English--SEMESTER –V

PAPER – V-- INDIAN ENGLISH LITERATURE (Prose & Poetry).

Course Objectives:

- To introduce students to prose writers of Indian English.
- To introduce students to poetry writers of Indian English.
- To introduce students to creative writing

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> HISTORY OF INDIAN ENGLISH PROSE & POETRY	1. Development of Indian English Prose 2. Major Writers in Indian English Prose 3. Development of Indian English Poetry. 4. Major Writers in Indian English Poetry.	<u>UNIT I</u> HISTORY OF INDIAN ENGLISH PROSE & POETRY (NO CHANGE)	1. Development of Indian English Prose 2. Major Writers in Indian English Prose: Tagore, Aurobindo, Radhakrishnan, Gandhi, Vivekananda, Nirad.C.Choudhary, Salman Rushdie. 3. Development of Indian English Poetry. 4. Major Writers in Indian English Poetry. Aurobindo. Michael.M.Dutt, Toru Dutt, Tagore, SarojiniNaidu, Ezekiel, Daruwallah ,Dom Moreas, Parthasarathy, Ramanujam, Shiv.K.Kumar
<u>UNIT II</u> PROSE SELECTIONS	1. An Ideal before Youth -Dr. Radhakrishnan 2. India’s Fiftieth anniversary- Salman Rushdie 3. Ashoka the beloved of Gods- Jawaharlal Nehru	<u>UNIT II</u> PROSE SELECTIONS (NO CHANGE)	1. An Ideal before Youth -Dr. Radhakrishnan 2. India’s Fiftieth anniversary- Salman Rushdie 3. Ashoka the beloved of Gods- Jawaharlal Nehru
<u>UNIT III</u> POETRY	1. A very Indian poem in English - Nissim Ezekiel. 2. Female of the	<u>UNIT III</u> POETRY	1. A very Indian poem in English - Nissim Ezekiel. 2. Female of the Species - Gauri

SELECTIONS	species - Gauri Deshpande. 3. The River -A. K .Ramanujan.	SELECTIONS (NO CHANGE)	Deshpande. 3. The River -A.K.Ramanujan.
<u>UNIT IV</u> SHORT STORIES	1. The Barbers’ Trade Union - Mulkraj Anand 2. Sparrows – K. Ahmad Abbas 3. Mrs. Datta Writes a letter – Chitra Banerjee Divakaruni.	<u>UNIT IV</u> SHORT STORIES (NO CHANGE)	1. The Barbers’ Trade Union - Mulkraj Anand 2. Sparrows – K. Ahmad Abbas 3. Mrs. Datta Writes a letter – Chitra Banerjee Divakaruni.
<u>UNIT V</u> CRITICAL APPRECIATION	PRACTICAL CRITICISM Appreciation of Unseen prose/Poetry selections <u>CREATIVE WRITING</u> <u>Prose essays</u> >Descriptive >Analytical >Narrative	<u>UNIT V</u> PRACTICAL CRITICISM & CREATIVE WRITING	PRACTICAL CRITICISM Appreciation of Unseen prose/Poetry selections <u>CREATIVE WRITING</u> <u>Prose essays</u> >Descriptive >Analytical >Narrative
<u>UNIT VI</u> LITERARY TERMS	Related to prose & poetry:Free verse, Problem Play, Absurd drama, Social novel, Stream of Consciousness novel, Bildungsroman, Point of view, Setting.	<u>UNIT VI</u> LITERARY TERMS (NO CHANGE)	Free verse, Problem Play, Absurd drama, Social novel, Stream of Consciousness novel, Bildungsroman, Point of view, Setting.

Assignment: Creative Writing-- Preparation of Magazine on creative writing

Pedagogy: Student Seminars, Discussions, Oral Presentations, lecture, Written Assignments, Comprehension, Reference work, Assignments.

References:

1. *“Indian Writing in English”- Srinivasa Iyengar, Sterling Publications, 1962.*
2. *“The Fair Voice: A Study of Indian Women poets in English” –Chavan P Sunanda, Sterling Publishers, 1984.*

DEPARTMENT OF ENGLISH -- SYLLABUS FOR ADVANCED ENGLISH

SEMESTER- V

PAPER VI AMERICAN ENGLISH LITERATURE

(PROSE & DRAMA)

Course Objectives:

- To introduce students to American English prose writers.
- To introduce students to American English writers of Drama

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> HISTORY OF AMERICAN PROSE	1. Origin and Development of American Prose 2. Major American Prose Writers 3. Estimation of American Prose	<u>UNIT I</u> HISTORY OF AMERICAN PROSE (NO CHANGE)	1. Origin and Development of American Prose 2. Major American Prose Writers : Thoreau, Ralph Waldo Emerson, Mark Twain, William Faulkner, John Steinbeck, Herman Melville. 3. Estimation of American Prose
<u>UNIT II</u> PROSE SELECTIONS	Walden –by H.D. Thoreau	<u>UNIT II</u> PROSE SELECTIONS (NO CHANGE)	Walden –by H.D. Thoreau
<u>UNIT III</u> HISTORY OF AMERICAN DRAMA	1.Origin & Development of American Drama 2.Major American Dramatists 3.Estimation of American Drama	<u>UNIT III</u> HISTORY OF AMERICAN DRAMA (NO CHANGE)	1.Origin & Development of American Drama 2.Major American Dramatists : Eugene O'Neill, Tennessee Williams, Arthur Williams, David Mamet,Edward

			Albee, T.S. Eliot 3. Estimation of American Drama
<u>UNIT IV</u> DRAMA PRESCRIBED TEXT	'Hairy Ape' by O'Neill	<u>UNIT IV</u> DRAMA PRESCRIBED TEXT (CHANGED)	'Hairy Ape' by O'Neill
<u>UNIT V</u> CRITICAL APPRECIATION	Unseen prose/drama selections	<u>UNIT V</u> PRACTICAL CRITICISM & CREATIVES WRITING	1. Critical Appreciation of unseen Drama/Prose Passage 2. Creative Writing on given theme.
<u>UNIT VI</u> LITERARY TERMS	Satire, Mock-epic, Heroic couplet, Epistle, Heroic Tragedy, Comedy of Manners, Genteel comedy, Sentimental Comedy, Periodical Essay, Picaresque novel, Epistolary novel	<u>UNIT VI</u> LITERARY TERMS (NO CHANGE)	Satire, Mock-epic, Heroic couplet, Epistle, Heroic Tragedy, Comedy of Manners, Genteel comedy, Sentimental Comedy, Periodical Essay, Picaresque novel, Epistolary novel

Book Review: Based on Syllabus for extensive reading

Assignment: PPT/Seminar

Pedagogy: Lecture, Extensive reading, Library reference work, Field trip to places of scenic Significance-Report Writing, Group dynamics, Paper presentations.

References:

1. *Cambridge History of English Literature-George Sampson.*
2. *A Students Handbook of America Literature- C.D. Narasimhaiah*
3. *A History of American Literature-William Peter Field Trent, John Erskine, Stuart P Sherman*

DEPARTMENT OF ENGLISH- ADVANCED ENGLISH SYLLABUS

SEMESTER- VI--PAPER VII-

INDIAN ENGLISH LITERATURE

(DRAMA& NOVEL)

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<u>UNIT I</u> HISTORY OF INDIAN ENGLISH DRAMA	1.Pre Independence Drama 2.Post Independence Drama 3.Major Dramatists in Indian English	<u>UNIT I</u> HISTORY OF INDIAN ENGLISH DRAMA (NO CHANGE)	1.Pre Independence Drama 2.Post Independence Drama 3.Major Dramatists in Indian English Aurobindo. Tagore, Girish Karnad, Vijay Tendulkar, Kalotkar, Deena Mehta, Asif Currimbhoy, Dattani
<u>UNIT II</u> DRAMA PRESCRIBED TEXT	Silence, the Court in Session -by Vijay Tendulkar	<u>UNIT II</u> DRAMA PRESCRIBED TEXT(NO CHANGE)	Silence, the Court in Session -by Vijay Tendulkar
<u>UNIT III</u> HISTORY OF INDIAN ENGLISH NOVEL	1.Pre Independence Novel 2.Post Independence Novel 3.Major Novelists	<u>UNIT III</u> HISTORY OF INDIAN ENGLISH NOVEL (NO CHANGE)	1.Pre Independence Novel 2.Post Independence Novel 3.Major Novelists RajaRao, R.K.Narayan, MulkRaj.Anand, Bhabani Bhattacharya, Nayantara Sehgal, K.Markandaya,Anitha Desai, Salman Rushdie, Vikram Seth, Kiran Desai, Anita Nair

<u>UNIT IV</u> NOVEL PRESCRIBED TEXT	Ladies' Coupe by Anita Nair	<u>UNIT IV</u> NOVEL PRESCRIBED TEXT (NO CHANGE)	Ladies' Coupe by Anita Nair
<u>UNIT V</u> CRITICAL APPRECIATION	Unseen Novel/Drama Selections	<u>UNIT V</u> PRACTICAL CRITICISM & & CREATIVE WRITING	Short Story on given topic
<u>UNIT VI</u> LITERARY TERMS	(Related to Novel & drama Irony, Objective and Subjective, paradox, persona, plot, Point of View, Realism, Naturalism, Satire, Soliloquy.	<u>UNIT VI</u> LITERARY TERMS (NO CHANGE)	Irony, Objective and Subjective, paradox, persona, plot, Point of View, Realism, Naturalism, Satire, Soliloquy

Assignment: Novel Review-I/II/III Generation Writers

References: *1. Introduction to Literature, fiction, Poetry & Drama-Sylvan Barnett*

2. Introduction to Indian Writing in English- Srinivas Iyengar

3. M.H. Abrahams- A Handbook of Literary Terms

Pedagogy: Lecture, Group Discussion, Seminar, Novel Review, Quiz, Discussion

DEPARTMENT OF ENGLISH
CLUSTER PAPERS

SEMESTER	PAPER	TITLE
Semester VI	VIII	A. American Literature
		B. Creative Writing
		C. Functional English.

Pedagogy: 1. Review of Literature, Library Reference book

3. Lecture Method
4. Group dynamics
5. Lecture
6. Seminar
7. Use of ICT
8. Movies- Audio, Video Materials.

DEPARTMENT OF ENGLISH- ADVANCED ENGLISH SYLLABUS –

CLUSTER -I

SEMESTER- VI -- PAPER VIII –

AMERICAN ENGLISH LITERATURE (POETRY & NOVEL)

UNIT	2021-22(OLD)	UNIT	2022-2023(NEW)
<p align="center"><u>UNIT I</u> HISTORY OF AMERICAN POETRY</p>	<p>1.Origin and development of American poetry</p> <p>2.Major American poets</p> <p>3.Estimation of American poetry</p>	<p align="center"><u>UNIT I</u> HISTORY OF AMERICAN POETRY (NO CHANGE)</p>	<p>1.Origin and development of American poetry</p> <p>2. Major American poets.</p> <p>Ezra Pound, Carlos Williams, E.E. Cummings, Carl Sandburg, Robinson Jeffers, Wallace Stevens, Robert Lowell, T.S. Eliot</p> <p>3.Estimation of American poetry</p>
<p align="center"><u>UNIT II</u> SELECTED POEMS</p>	<p>1.The Yachts-William Carlos Williams</p> <p>2.Hope is the thing with feathers-Emily Dickinson</p> <p>3.Stopping by woods on a snowy evening-Robert Frost</p> <p>4.Science-Robinson Jeffers</p> <p>5.Cinderella – Sylvia Path</p> <p>6.Life is fine-Langston Hughes.</p>	<p align="center"><u>UNIT II</u> SELECTED POEMS (NO CHANGE)</p>	<p>1.The Yachts-William Carlos Williams</p> <p>2.Hope is the thing with feathers-Emily Dickinson</p> <p>3.Stopping by woods on a snowy evening-Robert Frost</p> <p>4.Science-Robinson Jeffers</p> <p>5.Cinderella – Sylvia Plath</p> <p>6.Life is fine-Langston Hughes</p>

<p style="text-align: center;"><u>UNIT III</u></p> <p style="text-align: center;">HISTORY OF AMERICAN NOVEL</p>	<p>1. Origin and Development of American Novel</p> <p>2. Major American Novelists</p> <p>3. Estimation of American Novel</p>	<p style="text-align: center;"><u>UNIT III</u></p> <p style="text-align: center;">HISTORY OF AMERICAN NOVEL</p> <p style="text-align: center;">(NO CHANGE)</p>	<p>1. Origin and Development of American Novel</p> <p>2. Major American Novelists</p> <p>Mark Twain, N.Hawthorne, Faulkner, Poe, Melville, Henry Jones, Harriet Beecher Stowe, Sinclair Lewis, J.F Cooper.</p> <p>3. Estimation of American Novel</p>
<p style="text-align: center;"><u>UNIT IV</u></p> <p style="text-align: center;">NOVEL-PRESCRIBED TEST</p>	<p>Mark Twain’s “Adventures of Tom Sawyer”</p>	<p style="text-align: center;"><u>UNIT IV</u></p> <p style="text-align: center;">NOVEL-PRESCRIBED TEST</p> <p style="text-align: center;">(NO CHANGE)</p>	<p>Mark Twain’s “Adventures of Tom Sawyer”</p>
<p style="text-align: center;"><u>UNIT V</u></p> <p style="text-align: center;">CRITICAL APPRECIATION</p>	<p>Unseen Poem/ Novel passage</p>	<p style="text-align: center;"><u>UNIT V</u></p> <p style="text-align: center;">PRACTICAL CRITICISM & CREATIVE WRITING</p> <p style="text-align: center;">(NO CHANGE)</p>	<p>Unseen Poem/ Novel passage</p>
<p style="text-align: center;"><u>UNIT VI</u></p> <p style="text-align: center;">LITERARY TERMS</p>	<p>Related to Poetry & Novel:</p> <p>Biological criticism, Historical Criticism, Psychoanalytical criticism, Sociological criticism, Marxist criticism, feminist criticism, Archetypal criticism, Post colonial criticism.</p>	<p style="text-align: center;"><u>UNIT VI</u></p> <p style="text-align: center;">LITERARY TERMS</p> <p style="text-align: center;">(NO CHANGE)</p>	<p>Biological criticism, Historical Criticism, Psychoanalytical criticism, Sociological criticism, Marxist criticism, feminist criticism, Archetypal criticism, Post colonial criticism.</p>
	<p>Assignment</p>	<p style="text-align: center;">MOVIE REVIEW</p>	<p>Of English/American Classics</p>

References: *1. Contemporary American Poetry- Howard Nemerov*

2. A Students Handbook of American Literature- C.D. Narasimhaiah

Pedagogy: 1. Review of Literature, Library Reference book

3. Lecture Method

4. Group dynamics

5. Lecture

6. Seminar

7. Use of ICT

8. Movies- Audio, Video Materials.

Department of English

CLUSTER – II -- FUNCTIONAL ENGLISH

1. **Unit – I:** Reading & Comprehension – Short stories -20 Hrs

2. **Unit – II:** Vocabulary building—antonyms, Synonyms, Confusables, One word Substitutes, Spellings. 20hrs

3. **Unit – III:** Language building—Punctuations, Idioms, Re-arranging jumbled letters, Tenses, Writing paragraph with given vocabulary& pictures. 20hrs

4. **Unit – IV:** Writing for Specific purpose—Composition, letter writing, Dialogues, Interview, Narration, Flow chart, Report Writing, Diary Writing. 20hrs

5. **Unit – V:** Speech Practice—Pronunciation, Stress Pattern, Syllabification. 20hrs

Prescribed book:

“Interactions”

A Compilation by UG Department of English.

Assignments: Writing Report

Narratives

Short Stories

Department of English

CLUSTER – III --- CREATIVE WRITING

Objective: This course caters to the needs of students interested in composing Prose on Poetry in English by familiarizing them with the basic techniques of Creative writing.

UNIT I: Composition Techniques of Argumentative composition Assertive Argument, Argument by illustration, Factual Argument Logical Presentation

UNIT II: Non rational ways of writing Use of figures of speech and basic terms: Epigram, Euphemism, Irony, invective, paradox, pun, satire, adoption, plot, character etc.

UNIT III: Dialogue writing Nature of Dialogue, Purpose, Hints of Dialogue writing, Writing Dialogue (Practice)

UNIT IV: Non Fiction: Notebooks, Cuttings, Journals, Sketches, Stereotypes, Stock characters

UNIT V: Story Concept Stream of Consciousness Technique, Suspense, Suspension of Disbelief, Theme, Thrillers, Adventure and Quest Stories

EVALUATION CRITERIA:

Assignment-I -15M, Assignment-II-15M, Internal Test- 20M,

Semester End Exam/Internship/Project-50M

REFERENCES AND READING MATERIAL:

M.H Abrams : Glossary of Literary Terms

M.Frank. Writing as Thinking: A Guided Process Approach, Englewood Cliffs, Prentice Halls Reagents

Dr RS Aggarwal,Vikas Aggarwal.Objective English

K.M.Smita, Annie Pothan. English Conversational Practice. Sterling Publications. Pvt Ltd.

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

BBA – SEMESTER-I SYLLABUS

Communication skills – I

Unit I:

Introduction to communication: Meaning, Definitions, Process, Features, Objectives, Essentials of Good Communication, Barriers/ overcoming barriers.

Unit II:

Vocabulary Building: Words-Meaning, Synonyms, Antonyms, One Word Substitutes.

Unit III:

Basics of Grammar: Phrases, Idioms, Articles, Prepositions, Degrees of Comparison.

Unit IV:

Features of Written Correspondence: Types of Business Correspondence – Sales Letter, Claim Letter, Adjustment Letter, Quotation letter, Letter Placing Order.

Unit V:

Resume Writing: Types, Resume Writing for Various Jobs.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

BBA – SEMESTER-II SYLLABUS

Communication Skills – II

Unit - I

Business Communication : Memorandum, Notice, Agenda, Minutes, Social Correspondence, Telephone Skills and Electronic mail.

Unit – II

Reading skills: Comprehension of Factual Material, Reading Techniques and Guide lines for Effective Reading.

Unit – III

Spoken Skills:Phonetics – Transcription, Translation, Syllabification, Word Stress and Sentence Stress.

Unit – IV

Dyadic Communication: Everyday conversation and Dialogues on Situations.

Unit – V

Basics of Grammar: Direct and Indirect Speech, Tenses, Active& Passive voice.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P,New Delhi,2011

Kumkum Bharadwaj, *Professional Communication*, I.K.Publishing House, NewDelhi,2008

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

BBA – SEMESTER-III SYLLABUS

Professional English & Soft Skills – I

Unit I:

Body Language: Gestures, Facial Expressions, Eye Contact, Appearance, Positive Body Language.

Unit II:

Interpersonal Relationships: Concept & Features, Team Work, Analysis of Strengths & Weakness.

Unit III:

Time Management: Concept, Significance, Aspects & Relevance, Factors Causing Waste of Time.

Unit IV:

Writing Skills Paragraph Writing, Essay Writing, Common Errors, and Abbreviations.

Unit V:

Speaking Skills: Accent and Rhythm in Connected Speech, Intonation.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

BBA – SEMESTER-IV SYLLABUS

Professional English & Soft Skills – II

Unit – I

Soft Skills: Motivation, Goal Setting, Positive Attitude, Stress Management.

Unit – II

Spoken Skills: Extempore Speech Making, Short Speeches/ Presentations, Interview Skills and Group Discussions.

Unit – III

Written Skills: Report Writing, E-mail and Advertising.

Unit – IV

Information Transfer: Pie Diagrams, Bar Diagrams, Flow Charts, Interpretation of Pictures, Interpretation of Tables.

Unit – V

Vocabulary Building: Words often mis-spelt, Punctuation, Words often Confused.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

I.B.VOC-I SEMESTER SYLLABUS

COMMUNICATION SKILLS IN ENGLISH-I

UNIT-I

COMMUNICATION

Meaning and Definition-Process-Features-Importance-Essentials of Good communication-Communication Barriers-Overcoming Barriers

UNIT-II

REMEDIAL GRAMMAR

Direct and Indirect Speeches-Degrees of Comparison-Active and Passive Voice-Common Errors Including Spelling-Articles

UNIT-III

READING SKILLS

Reading Comprehension, Barriers of Reading Comprehension, Various Methods of Reading-Comprehension Exercises, Homonyms, Idiomatic Expressions.

UNIT-IV

WRITING SKILLS

Features of Written Communication-Letter Writing-Job Application Letter and Resume

UNIT-V

SPEAKING SKILLS

Essentials of Spoken English-Speeches on Various Occasions-Asking for Directions-Conversations-Telephonic Conversation

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU

Communication Skills English-II

I B. Voc-II Semester syllabus

UNIT-I

COMMUNICATION: [Speaking Skills]

Face-to-Face Conversation – Making polite requests –Expressing Sympathy –Agreeing & Disagreeing –Making Complaints –Asking for and giving permissions

UNIT-II

REMEDIAL GRAMMAR : (Tenses)

Tenses –Simple Present –Present Progressive –Present Progressive –Present Perfect –Present Perfect Progressive –Simple Past-(3) –Simple Future

UNIT-III

READING SKILLS:

Necessary Elements of Good Reading, Reading Techniques, Synonyms, Antonyms, One Word Substitutes.

UNIT-IV

WRITING SKILLS:

Paragraph writing – Essay Writing

UNIT-V

LISTENING SKILLS:

Hearing Vs Listening – Importance of Listening – Barriers to Listening – Developing Listening Skills

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

II B.VOC-III SEMESTER SYLLABUS

COMMUNICATION & SOFT SKILLS-I

UNIT-I

PRESENTATION SKILLS

Punctuation-Vocabulary-Conversation-Role Play-Speeches

UNIT-II

BODY LANGUAGE

Meaning-Nature and Scope-Factors Influencing Body Language-Components of Body Language-Types of Gestures

UNIT-III

TEAM-DYNAMICS

Introduction-Definition of Team-Ground Rules for Team-Types of Team-Tips for Effective Teamwork Skills-Importance of Communication in Team Building

UNIT-IV

GROUP DISCUSSION

Introduction-How to Address-Communication Skills-Do's and Don'ts in Group Discussion-Capability-Co-Ordinate and Lead-Exchange of Thoughts

UNIT-V

INTERVIEW SKILLS

Introduction-Different Types of Interviews-Before Interview-During Interview-Do's and Don'ts of Interview

DEPARTMENT OF ENGLISH

SYLLABUS 2022-2023 -- Add –On – Course – Semester VI- 40 hours.

English for Competitive Exams --Course Outcomes

	Course Objective Statement
CO1.	Understand Grammar
CO2.	Learn how to spot errors in sentences
CO3.	Analyse and infer reading comprehension passages, paragraph writing
CO4	Effectively understand and frame sentences, vocabulary formation, sentence completion Exercises
CO5	To think and write different types of Essays.

- Comprehension.
- Common Errors (Parts of Speech).
- Synonyms
- Antonyms.
- Misspelled Words
- Difference of Meaning of Similar Words
- One Word Substitutes.
- Idioms and Phrases.
- Fill in the Blanks
- Rearrangement (Jumbled Words)
- Spotting Errors
- Sentence Completion.
- Paragraph writing
- Filling up Blanks with Prepositions.

REFERENCES

1. *R. P. Bhatnagar & Ragul Bhargava- English for Competitive Exams, Macmillan 2011*
2. *English for competitive exams—Department.*

DEPARTMENT OF ENGLISH

English For IELTS - Certificate Course

Duration: 40 Contact Classes

40 Hours Lab Practicals

Time Frame: 3 Months

Course Outcomes:

1. To introduce students to a wide range of vocabulary & usage.
2. To Orient students to listen and comprehend different register of English.
3. To introduce students to learn writing tasks- Paragraph & essays.
4. To orient students to understand & undertake information transfer activities.
5. To orient students towards speech training focusing on accent, Pronunciation & intonation.
6. To finally prepare students to take up IELTS examination.

Unit –I: Listening Skills: Listening exercises, Listening for accent, listening for information, listening to summarize. (10Hours)

Unit –II: Reading Skills: Skimming, Scanning, Reading for information, leading to comprehend, Practice in reading comprehension passages. (10Hours)

Unit – III: Writing Skills: Interpreting & analyzing pie charts, graphs, bar diagrams & transferring information, writing short essays on topical issues. (10Hours)

Unit- IV: Spoken Skills: Introduction to proper accent & intonation, making short presentations, day to day activities, phatic communication, speaking with cue cards, Short speech making. (10Hours)

Laboratory Practice: Using a) Cambridge Series, b) Cambridge ESOL Practice Tests IELTS Study Material

DEPARTMENT OF ENGLISH

SKILL DEVELOPMENT COURSES

PUBLIC RELATIONS

Total 30 hrs (02 h/wk, 02 Cr & Max 50 Marks)

Unit I

06 Hrs

Public Relations-Meaning, Definition, Nature and Scope, Historical Background, Technological and Media Revolution and Role in Business, Government, Politics, NGOs and Industry

Unit II

10 Hrs

Concepts of Public Relations-Press, Publicity, Lobbying, Propaganda, Advertising, Sales Promotion and Corporate Marketing Services, Tools of Public Relations Press Conferences, Meets, Press Releases, Announcements, Webcasts

Unit III

10 Hrs

Public Relations and Mass Media, Present and future of Public Relations in India, Ethics of Public Relations and Social Responsibility, Public Relations and Writing Printed Literature, Newsletters, Opinion papers and Blogs

Co-curricular Activities Suggested: (04 Hrs)

1. Invited lecture by local field expert/ eminent personality on Public Relations
2. Visit to Press
3. Opinion Survey, Media Survey and Feedback
4. Case Studies
5. Organizing mock press conferences, exhibitions
6. Assignments, Group discussion, Quiz etc.

DEPARTMENT OF ENGLISH
SKILL DEVELOPMENT COURSES
JOURNALISTIC REPORTING

Syllabus:

Unit-I: 06 Hrs

- I. Introduction to Journalism
- II. Nature, Growth and Development in post independence era
- III. Print Media, Mass Media and Electronic Media,
- IV. Press as a Fourth Estate
- V. Role of Press in Democracy.

Unit-II: 10 Hrs

- I. Concept of News
- II. News Values
- III. Sources of News
- IV. News gathering ways: Press Conferences, Press Releases, Events, Meets
- V. Interviewing-Types of Interviews and Interviewing Techniques
- VI. Methods of News Writing: Leads, News Stories and Body Development.

Unit- III: 10 Hrs

- I. Reporting
- II. Kinds of Reporting
- III. Objectives, Interpretative, Investigative, Legal, Developmental, Political, Sports, Crime, Economic, Commercial, Disaster, Technical and Scientific Reporting
- IV. Writing Special features: Photo features, Human interest features, Profiles, Column Writing, Writing for Radio and Television
- V. Values and Ethics of Journalism.

Co-curricular Activities Suggested: (04 Hrs)

1. Collection and study of various English and Telugu Newspapers
2. Invited lecture/basic training by local experts
3. Visit to local Press office
4. Informally attending Press Conferences and Meets and taking notes
5. Assignments, Group discussion, Quiz etc.

DEPARTMENT OF ENGLISH

SKILL DEVELOPMENT

DISASTER MANAGEMENT

Total 30hrs (2hrs/week) 2 Credits Total 50 Marks

UNIT-I: 06 hrs

- I. Introduction of Disaster
- II. Different types of disasters-
 - a. Natural- (flood, cyclone, earthquake, fire and pandemic)
 - b. Accidental- (Fire, Blasting, Chemical leakage, Rail, Aviation, Road boat tragedies and nuclear pollution)
- III. Disaster Management Act 2005

UNIT-II: 09hrs

- I. Causes and immediate effects of Disasters
 - a. Preparedness of disasters
 - b. Precautions
 - c. Dissemination of information
- II. Nature and concepts
 - a. Role of National Disaster Management
 - b. Authority and Role of Government and non-governmental organizations in protecting human live stock and natural resources
- III. Use of technology
- IV. Role of Citizens and Youth in the prevention.

UNIT-III - 09 hrs

- I. Post disaster effects
- II. Short term
 - a. Procedures for Rehabilitation and Recovery
 - b. Role of volunteers and Safety Precautions
- III. Long term
- IV. Remedial and preventive measures
- V. Collection, filing and storage of information
- VI. Case studies

III B.VOC (WEB TECHNOLOGY AND MULTIMEDIA)

VI SEMESTER - PROFESSIONAL SKILLS

SYLLABUS 2022-2023

Unit 1

Career Planning

Introduction, Benefits of Career Planning, Guidelines for choosing a career, Tips for successful career planning, Developing career goals, Final thoughts on career planning.

The Art of Writing E-mail

Introduction. The mail magic. Use of appropriate salutations, Use of smileys, Shorten the file attachment.

Unit 11

Body Language

Introduction, Body talk. Forms of Body language, parts of body language, origin, uses, body language in building inter personal relations, body language in building industrial relation, 1 pes of body language, gender differences, shaking hands.

Unit 111

Group Discussion

Introduction, Meaning of GD, Why Group Discussion. Characters tested in GD, Tips on GD, Types of GD. Skills required in GD, Consequences of GD. Behavior in GD. Traits tested in GD, Movement and gestures to be avoided in a GD, Topics for GD.

Team Building and Team Work

Introduction, Meaning, Aspects of Team building, Skills needed for teamwork, role of a team leader, Difficulties faced in inter- group collaborations.

Unit –IV

Interview Skills

Introduction, Types of Interviews, Reasons for rejecting a candidate, Attending Job Fair, Post Interview Etiquette, Telephonic Interview, Dress Code, How to present well in Interview, Interview Quotations, Preparation of CV/Resume

Unit V

Time Management

Introduction, The 80:20 Rule, Sense of Time Management, Features of Time, Grouping of Activities, Time wasters and Time savers, Time circle planner

Stress Management

Effects of Stress, Kinds of Stress, Sources of stress, Behavior identified with stress, Spotting Stress in you, Stress Management tips.

English Department – Program Outcomes

Vision:

To equip women learners with tools of communication skills for excellence in careers and higher education.

Mission:

- To foster a spirit of enthusiasm in learning communication English for different contexts and purposes.
- To enable students to be able to develop confidence in using the English language to speak with clarity, write effectively, record and reflect on issues pertaining to the contemporary world.
- To enable reviews of literary pieces & inculcate the reading habit.

General English SEMESTER I AND II- Learning Outcomes

Program Outcomes:

To Equip students with communication skills and enable them to speak ,read and write English in differing contexts

Program Specific Outcomes:

The Expected learning outcomes of the general English the students are expected course is that to demonstrate the following:

- To develop comprehension of simple prose, poetry texts.
- To be able to summarize the content of stories, anecdotes, prose & poetry pieces.
- To be to analyse real life situations related to texts prescribed and be able to communicate in oral written format with clarity.
- To gain a thorough knowledge of English speech sounds and be able to articulate them.
- To be able to gain competence in the conversations, style, language in different forms of correspondence formal and informal.
- To introduce students to dialogue writing, preparation of role- plays and basic grammar.

Program outcome:

- To orient students towards value based education through parables and real life stories.

- To promote job skills through inculcating mastery in job application skills.
- To familiarize students to use multimedia in the English language lab in learning communicative English skills.
- To faster perfection in language through grammatical structures.

SEMESTER III

Program outcome:

To develop students about communication and presentation skills.

Program specific outcome:

- To foster communication skills in students in formal and informal registers
- To enhance reading skills in students to introduce reading of text and comprehension
- To introduce students to women related issues and promote short oral and written presentations and debates
- To enable students to fill forms with accuracy
- To introduced students to communicate online (CSS lab)
- To enable expansion of vocabulary instruments through idiomatic expression

I YEAR ADVANCED ENGLISH: SEMESTER-I

INTRODUCTION TO LITERATURE

Program outcomes:

Some of the course learning outcomes that students of this courses are required to demonstrate.

Program specific outcomes:

- To understand difference between genres of writing prose and short stories.
- To be introduced types of prose writing, narrative, descriptive and reflective.
- To understand about plot, character, and dialogue, short stories and attempt to create plots and stories.
- To make a review of short stories and poetry.
- To be able to write short poems on their own.

SEMESTER-II

Program outcome:

To develop students regarding poetry and drama.

Program specific outcomes:

- To introduce students to different forms of poetry.
- To orient students about character, dialogue and plot in plays.
- Orientation on English language and its gradual development.

II YEAR ADVANCED ENGLISH

SEMESTER-III

Program outcome:

- To introduce students to the backgrounds of history and British poetry & types of prose writing.

Program specific outcomes:

- To learn about the history of British drama and different elements of drama.
- To train students in creative writing, poetry and short skits dramatization.
- To train students in history of British prose and novel.

SEMESTER-IV

Program outcome:

To introduce students to the History of British Poetry and types of prose writing.

Program specific outcomes:

- To orient students to history of British drama & different elements of drama.
- To enable students to write creative poems and short skits dramatization.
- To train students in history of British prose and novel.

III YEAR ADVANCED ENGLISH: SEMESTER-V

PAPER-V: INDIAN ENGLISH LITERATURE

Program outcome:

To introduce students about Indian English literature.

Program specific outcomes:

- To orient students about the prose writers of Indian English literature.
- To enable students to develop creative writing in different prose style.
- To introduce students to genres of Indian English writing such as poetry and prose.

PAPER-VI: AMERICAN ENGLISH LITERATURE

Program outcome:

To introduce students to the American English literature.

Program specific outcomes:

- To orient students about the American English prose writers.
- To introduce students to American English writers of drama.
- To enable students about creative writing.

PAPER- VII: INDIAN ENGLISH LITERATURE (DRAMA&NOVEL)

Program outcome:

To introduce students to Indian English literature relating to Indian English drama and novel.

Program specific outcome:

- To orient students about the poets of American English literature.
- To introduce students to the novelists of American English literature.
- To enable them about creative writing of unseen poem/novel/passage.

BBA – SEMESTER- I COMMUNICATION SKILLS – I

Program outcome:

To orient students about communication skills for the orientation.

Program specific outcome:

- To enable students about vocabulary building
- To introduce basics of grammar to students.
- To orient students with features of business correspondence.
- To enable students to write resumes for interviews.

BBA – SEMESTER-I- COMMUNICATION SKILLS – II

Program outcome:

To orient students about communication skills for job orientation.

Program specific outcome:

- To enable students about business communication skills.
- To orient students about reading skills and spoken skills.
- To introduce LSRW skills to students for better communication skills.
- To understand dyadic communication.

II BBA – PROFESSIONAL ENGLISH & SOFT SKILLS – I

Program outcome:

To introduce students to professional English and soft skills.

Program specific outcome:

- To orient students about body language.
- To develop interpersonal relationships, team work among students.
- To teach students about time management.
- To enable students about basic writing skills and speaking skills.
- To orient students to business correspondence and resume writing.

II BBA – PROFESSIONAL ENGLISH AND SOFT SKILLS - II

Program outcome:

To introduce students to professional English and soft skills in order to orient them towards

Program specific outcomes:

- To orient students about soft skills.
- To enable students about writing skills and speaking skills and phonetics.
- To teach students about information transfer and building vocabulary.

I BVOC – COMMUNICATION SKILLS IN ENGLISH – I

Program outcome:

To introduce students about communication skills in English – I

Program specific outcomes:

- To enable students about communication.
- To orient students about remedial grammar.
- To introduce students about reading skills, speaking skills and writing skills.

I BVOC – COMMUNICATION SKILLS IN ENGLISH – II

Program outcome:

To introduce students about communication skills in English – II.

Program specific outcomes:

- To enable students about communication
- To orient students about remedial grammar.
- To introduce students about reading skills, speaking and writing skills.

II BVOC – COMMUNICATION SKILLS – I

Program outcome:

To introduce students about communication skills and soft skills.

Program specific outcomes:

- To enable students about presentation skills.
- To introduce students about body language.
- To orient students about team dynamics.
- To introduce students about group discussion and interview skills.

Ch.S.D.St.Theresa's College for Women (A), Eluru
I B.A /B.Com / B. Sc/ H Sc/ BBA Semester –I Syllabus
General Hindi Paper –I
Admitted Batch 2022–23
(Prose, Short Stories, Grammar and Letter Writing)

Credits :03

Teaching Hrs/week: 04

UNIT 1

गद्य संदेश (Prose)(सं. डा .वी. एल. नरसिंहम शिवकोटि)

1. साहित्य की महत्ता
2. मित्रता
- 3.पुथ्वीराज की आँखें

UNIT 2

कथा लोक (Short Stories)(सं. डा. घनश्याम)

- 1.मुक्तिधन
- 2.गूदडसाई
- 3.उसने कहा था

UNIT 3

व्याकरण (Grammar)(सरल हिन्दी व्याकरण.. दक्षिण भारत हिन्दी प्रचार सभा..मद्रास)

लिंग, वचन, काल, संधि विच्छेद ।

UNIT 4

कार्यालयीन शब्दावली : अंग्रेजी से हिंदी और हिंदी से अंग्रेजी

(Changing Administrative Terminology Hindi to English and English to Hindi)

UNIT 5

पत्र लेखन : वैयक्तिक पत्र(छुट्टी पत्र, पिता, मित्र के नाम पत्र, पुस्तक विक्रेता के नाम पत्र

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Ch.S.D.St.Theresa's College for Women (A), Eluru
I B.A/ B.Com/ B. Sc/ H Sc/ BBA II Semester Syllabus
General Hindi Paper –I Admitted Batch 2022–23
(Prose, Short Stories, Grammar and Letter Writing)

Credits :03

Teaching Hrs/week: 04

Unit 1

गद्य संदेश (Prose) (सं. डा.वी.एलण्णरसिंहम शिवकोटि)

1. बिंदा
2. भारत एक है
3. एच.आई.वी/एड्स

Unit 2

कथा लोक (Short Stories) (सं. डा. घनश्याम)

1. भूख हडताल
2. परमात्मा का कुत्ता
3. और वह पढ गई...

Unit 3

व्याकरण (Grammar) (सरल हिन्दी व्याकरण.. दक्षिण भारत हिन्दी प्रचार सभा..मद्रास)

वाक्यों की शुद्धि ,वाच्य ।

Unit 4

कार्यालयीन हिंदी : पदनाम ... हिंदी से अंग्रेजी और अंग्रेजी से हिंदी

(Changing Administrative Terminology Hindi to English and English to Hindi)

Unit 5

पत्र लेखन : (Letter Writing)

नौकरी केलिए आवेदन पत्र

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Ch.S.D.St.Theresa's College for Women (A), Eluru
II B.A. /B.Com / B. Sc/ H Sc/ BBA --III Semester –Syllabus
General Hindi Paper –III Admitted Batch 2022–23
(Old and Modern Poetry, History of Hindi Literature, Essays,
(Translation and Functional Hindi)

Credits :03

Teaching Hrs/week. 04

Unit 1

1. काव्यदीप (Ancient and Modern Poetry) (सं.बी.राधाकृष्णमूर्ति)

साखी...1..10 दोहे

सूरदास...बाल वर्णन

मातृभूमि...मैथिलीशरण गुप्त

तोडती पत्थर...सूर्यकांत त्रिपाठी निराला

मानव ..सुमित्रानंदन पंत

Unit 2

2. हिंदी साहित्य का इतिहास (History of Hindi Literature) (डा. बाबू गुलाबराय)

हिंदी साहित्य का काल विभाजन और नामकरण (डा. रामचन्द्र शुक्ल)

भक्तिकाल की विशेषताएँ

कृष्ण भक्तिशाखा ...सूरदास

ज्ञानाश्रयी शाखा ... कबीर

Unit 3

3. निबंध (General Essays)

1.समाचार पत्र

2.बेकारी समस्या

3.पर्यावरण और प्रदूषण

4. साहित्य और समाज

Unit 4

4. अनुवाद (Translation) अंग्रेजी से हिंदी (Five Simple Sentences)

Unit 5

5. प्रयोजनमूलक हिंदी (Functional Hindi)

राष्ट्रभाषा, राजभाषा, संपर्क भाषा

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Course Outcomes:

After successful completion of this course, the student will be able to;

- Solve linear differential equations
- Convert non exact homogeneous equations to exact differential equations by using integrating factors
- Know the methods of finding solutions of differential equations of the first order but not of the first Degree.
 - Solve higher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients.
- Understand the concept and apply appropriate methods for solving differential equations.

UNIT-I(12Hrs)

Differential equations of first order and first degree:

Linear differential equations, Differential equations reducible to linear form.(**Only problems**)
(2.5, 2.6)

Exact differential equations, integrating factors, Change of Variables.(**Only problems**)
(2.7 to 2.9)

Chapter: 2.5 to 2.9

UNIT-II (12 Hrs)

Differential Equations of first order but not of the first degree:

Equations solvable for p; Equations solvable for y; Equations solvable for x;

Equations that do not contain x (or y); Equations homogeneous in x and y;

Equations of the first degree in x and y-Clairaut's Equation(3.1 & 3.2)

Orthogonal Trajectories(4.20)

Chapter: 3.1 &3.2;4.20

UNIT-III (12 Hrs)

Higher order linear differential equations-I:

Solution of Homogeneous linear Differential equations of order n with constant coefficients, Solutions of the non homogeneous linear differential equations with constant coefficients by means of polynomial operators

(when $Q(x) = be^{ax}$;when $Q(x) = b \sin ax$ or $b \cos ax$) (5.2, 5.3.3,5.3.4&5.3.6)

Chapter: 5.2, 5.3(5.3.3, 5.3.4 & 5.3.6)

UNIT-IV(12 Hrs)

Higher order linear differential equations-II

Solutions of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators (5.3.1, 5.3.2, 5.3.5 & 5.3.7)

(when $Q(x) = bx^k$ and $P(D) = D - a_0$, $a_0 \neq 0$; when $Q(x) = bx^k$ and

$P(D) = a_n D^n + a_{n-1} D^{n-1} + \dots + a_1 D$; when $Q(x) = e^{ax} V$ where V is a function of x ; when $Q(x) = xV$ where V is any function of x)

Chapter: 5.3.1, 5.3.2, 5.3.5 & 5.3.7

UNIT-V(12 Hrs)

Higher order linear differential equations-III

Method of variation of parameters; Linear differential Equations with non-constant coefficients; (5.5 and 5.6)

The Cauchy-Euler Equation, Legendre's linear equations, miscellaneous differential equations. (5.7 to 5.9)

Chapter: 5.5 to 5.9

Student Activities

Class room activities: Power point presentations, Assignments.

Library activities: Visit to library and preparation of notes for Assignment problems.

Activities in the seminar, workshops and conferences: Participation/Presentation in seminar/workshop/conference.

Co-Curricular Activities(15 Hours)

Quiz Competitions, Seminars, Group Discussion

Prescribed book:

Differential equations and their applications (Second Edition) by Zafar Ahsan, PHI Private Limited, New Delhi.

Reference Books :-

1. A TEXT BOOK OF MATHEMATICS I B, Sc Semester-I by Dr. A. Anjaneyulu
2. A text book of mathematics for BA/BSc Vol 1 by N. Krishna Murthy & others, published by S. Chand & Company, New Delhi.
3. Ordinary and Partial Differential Equations by Dr. M.D. Raisinghania, published by S. Chand & Company, New Delhi.
4. Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha- Universities Press.
5. Differential Equations - Srinivas Vangala & Madhu Rajesh, published by Spectrum University.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

CH.SD. ST. THERESA'S COLLEGE FOR WOMEN(A), ELURU

I B.Sc Degree course *Syllabus*
MATHEMATICS, II SEMESTER; PAPER-II
ANALYTICALSOLID GEOMETRY75HRS

Course Outcomes:

After successful completion of this course, the student will be able to;

1. get the knowledge of planes.
2. basic idea of lines, sphere and cones.
3. understand the properties of planes, lines, spheres and cones.
4. express the problems geometrically and then to get the solution.

UNIT-I(12Hrs)

PLANE

Determination of a plane under given conditions, Intercept form of the equation of the plane.Plane through three points.System of planes. Two sides of a plane. (Ch: 2.4 to 2.6)

Length of the perpendicular from a point to a plane.Bisector of angles between two planes.Joint equation of two planes.Orthogonal projection on a plane. (Ch. 2.7 to 2.9)

Chapter: 2.4 to 2.9

UNIT – II(12Hrs)

RIGHT LINE

Representation of Line.Equation of the Line through a given point drawn in a given direction.Equation of a Line through two points. Two forms of the equation of a line, Transformation from unsymmetrical to the symmetrical form.Angle between a Line and a plane. Condition for a Line to lie in a plane. (Ch: 3.1, 3.2& 3.3)

Coplanar Lines(both symmetrical form, both unsymmetrical form, one is symmetric and another one is un symmetric form), condition for the Co planarity of Lines. Number of arbitrary constants in the equations of a straight line. The shortest distance between two lines(both symmetrical form, both unsymmetrical form, one is symmetric and another one is un symmetric form), Length of the perpendicular from a point to a line . (Ch: 3.4.3.5,3.6& 3.7)

Chapter: 3.1 to 3.7

UNIT – III(12Hrs)

THE SPHERE

Definition, Equation of a Sphere.General equation of a sphere.The Sphere through four given points.Plane section of a sphere.Intersection of two spheres. Sphere with a given diameter.

Equations of a circle. Sphere through a given circle.(Ch:6.1,6.2, 6.3 & 6.4)

Intersection of a sphere and a line.Power of a point.Equation of a tangent plane.Plane of contact.The polar plane.Pole of a plane, some results concerning poles and polars. (Ch: 6.5 & 6.6)

Chapter: 6.1 to 6.

UNIT– IV(12Hrs)

THE SPHERE

Angle of intersection of two spheres.Condition for the orthogonally of two spheres.Radical plane.Radical line.Radical Centre.Simplified form of the equation of two given Spheres. (Ch: 6.7to 6.9)

CONES

Definitions of a cone; vertex; guiding curve; generators; Equation of the cone with a given vertex and guiding curve; equations of cones with vertex at origin are homogenous; Condition that the general equation of the second degree should represent a cone.(Ch: 7.1&7.2)

Chapter:6.4 to 6.9 and 7.1 to 7.2

UNIT –V(12Hrs)

CONES

Mutually perpendicular generators of a Cone, The tangent lines and tangent plane at a point, Condition for tangency, Reciprocal Cones, The right circular cone. (Ch:7.3,7.4&7.6)

Chapter:7.3, 7.4 &7.6

Student Activities

Class room activities: Power point presentatios, Assignments.

Library activities: Visit to library and preparation of notes for Assignment problems.

Activities in the seminar, workshops and conferences:Participation/Presentation in seminar/workshop/conference.

Co-Curricular Activities(15 Hours)

Quiz Competitions, Seminars,Group Discussion

Prescribed text book:

Analytical solid geometry - Shanthi Narayan and P.K. Mittal. Published by S.Chand&Company Ltd, New Delhi (2008)

Reference Books :

1. A TEXT BOOK OF MATHEMATICS I B,Sc Semester-II by Dr.A.Anjaneyulu
2. A text book of Mathematics for BA/B.ScVol 1, by V Krishna Murthy & Others, Published by S. Chand & Company, New Delhi.
3. A text Book of Analytical Geometry of Three Dimensions, by P.K. Jain and Khaleel Ahmed, published by Wiley Eastern Ltd., 1999.
4. Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill Publishers Company Ltd., New Delhi.
5. Solid Geometry by B.RamaBhupal Reddy, published by Spectrum University

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

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Unit-III

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Unit-IV

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Unit-V

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NOTE:

In part I Examiner may divide 8 marks for their convenience. (i.e 8+0 or 2+6 or 3+5 or 4+4)

Course Outcomes:

After successful completion of this course, the student will be able to;

- Acquire the basic knowledge and structure of groups, subgroups and cyclic groups.
- Get the significance of the notation of a normal subgroups.
- Get the behavior of permutations and operations on them.
- Study the homomorphisms and isomorphisms with applications.
 - Understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems.
- Understand the applications of ring theory in various fields.

UNIT – 1: (12Hrs)

Groups :-

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group. Composition tables with examples. **(Chapter :2.1 to 2.15)**

UNIT – 2: (12Hrs)

Subgroups, Co-sets and Lagrange's Theorem :-

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition – examples-criterion for a complex to be a subgroups. Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups. **(Chapter: 3)**

Cosets Definition – properties of Cosets–Index of subgroups of a finite groups–Lagrange's Theorem. **(Chapter: 4.1 to 4.4)**

UNIT –3: (12Hrs)

Normal Subgroups :-

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group – simple group – quotient group – criteria for the existence of a quotient group. **(Chapter: 5)**

Homomorphism :

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications. (Chapter: 6)

UNIT – 4: (12Hrs)

Permutations

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley’s theorem. (Chapter: 7)

Cyclic Groups :-

Definition of cyclic group – elementary properties – classification of cyclic groups.(Chapter: 8.1 to 8.4)

UNIT – 5: (12Hrs)

Rings

Definition of Ring and basic properties ,Boolean Rings, Divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring, The characteristic of an Integral Domain, The Characteristic of a field, Sub Rings, Ideals, Principal ideal, Quotient Rings.

CHAPTER: 9 and 10(10.1 to10.4)

Student Activities

Class room activities: Power point presentatioes, Assignments.

Library activities: Visit to library and preparation of notes for Assignment problems.

Activities in the seminar, workshops and conferences:Participation/Presentation in seminar/workshop/conference.

Co-Curricular Activities(15 Hours)

Quiz Competitions, Seminars,Group Discussion

Prescribed book:

A Text Book of B.Sc., Mathematics Volume-II – S.CHAND. (14th Revised edition) For Units-I,II,III,& IV.

A Text Book of B.Sc., Mathematics Volume-II – S.CHAND. (14th Revised edition) For unit V.

Reference Books :-

1. A TEXT BOOK OF MATHEMATICS II B,Sc Semester-III by Dr.A.Anjaneyulu
2. Modern Algebra by A.R.Vasishtha,KrishnaPrakashan Media (P) Ltd.
3. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
4. Rings and Linear Algebra by Pundir&Pundir, published by PragathiPrakashan.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

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Unit-III

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Unit-IV

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Unit-V

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NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Course Outcomes:

After successful completion of this course, the student will be able to

- Get clear idea about the real numbers and real valued functions.
- Obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.
- Test the continuity and differentiability and Riemann integration of a function.
- Know the geometrical interpretation of mean value theorems.

Unit-I (12 Hrs)

Real numbers & Sequences

The algebraic and order properties of \mathbb{R} – Absolute value and real line, completeness property of \mathbb{R} -Applications of supreme property-intervals.

(No Question is to be set from this portion)

Sequences and their limits-Range and Bounded of sequences-Limit of a sequence and convergent sequence-Theorems on limits-Properly divergent sequences-Monotone sequences. (14.1 to 14.11)

Limit point of a sequence-Peak of a sequence and monotone subsequences-Cauchy sequences-Cauchy's general principle of convergence-Cauchy's first theorem on limits-Cauchy's second theorem-Cesaro's theorem. (14.12 to 14.16)

CHAPTER: 14.1 to 14.16

Unit-II (12 Hrs)

Series

Introduction to series-Convergence of series-Cauchy's general principle of convergence for series Series of non-negative terms.1.P-Series test.2.Cauchy's n^{th} root test or Root test.) (15.1 to 15.7)

3.D'Alembert's test or Ratio test Raabe's test (Only problems on Raabe's test) Alternating series- 4.Leibnitz test. Absolute convergence and Conditional convergence (15.8 ,15.12 and15.13)

Additional Input:GeometricSeries,Problems on Limit Comparision test.

CHAPTER: 15.1 to 15.8 &15.12, 15.13

Unit-III (12 Hrs)

Continuous Functions

Real valued functions-Boundedness of a function-Limit of function-Algebra of limits-Limits of some standard functions-infinite limits-Limits at infinity(**No question is to be set from this portion**)

Continuous functions-Continuity of a function at point- Continuity in an interval-Sequence criterion or Heine's theorem-Discontinuity-Continuity of some standard functions-Algebra of continuous functions. (16.9 to 16.14)

Properties of continuous functions on a closed interval, uniform continuity (16.15 and 16.16)

CHAPTER: 16.9 to 16.16

Unit-IV (12 Hrs)

Differentiation

Derivability of a function at a point-Derivability on an interval-Derivability and continuity of a function- Algebra of derivatives, Increasing and decreasing functions, Darboux's theorem (17.1 to 17.7)

Mean value theorems: Role's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem. (17.10).

CHAPTER: 17.1 to 17.7&17.10

Unit-V (12 Hrs)

Riemann Integration

Riemann integral, Riemann integrable functions-Darboux's theorem-Necessary and sufficient condition for integrability (18.1 to 18.8)

Properties of integrable functions, Fundamental theorem of integral calculus-Integral as the limit of a sum- Mean value theorems- (18.9 to 18.15)

CHAPTER: 18.1 to 18.14

Student Activities

Class room activities: Power point presentations, Assignments.

Library activities: Visit to library and preparation of notes for Assignment problems.

Activities in the seminar, workshops and conferences: Participation/Presentation in seminar/workshop/conference.

Co-Curricular Activities(15 Hours)

Quiz Competitions, Seminars, Group Discussion

WEB LINKS

https://drive.google.com/file/d/1BPWJAS6NqSxmYt2VMSHpEEM4z52_pbW/view?usp=sharing

<https://drive.google.com/file/d/1oFNosFs8JWqB2pKGqpYtgauRI3BGtJBB/view?usp=sharing>

PRESCRIBED Book

A Text Book of B.Sc., Mathematics Volume-II – S.CHAND. (14th Revised edition)

Reference Books :

1. A TEXT BOOK OF MATHEMATICS I B,Sc Semester-II by Dr.A.Anjaneyulu
2. Principles of Real Analysis by S.C.Malik, New Age International Publishers
3. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D.
Published by S. Chand & Company Pvt. Ltd., New Delhi

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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Unit-II

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4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

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(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Course Outcomes:

After successful completion of this course, the student will be able to;

- Understand the concepts of vector spaces, subspaces, bases, dimension and their properties.
- Understand the concepts of linear transformations and their properties
- Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods
- Learn the properties of inner product spaces and determine orthogonality in inner product spaces.

Unit-I (12 Hrs)

Vector Space

Vector Space, General properties of vector spaces, vector Sub spaces, Algebra of subspaces ,Linear combination of vectors, linear span, Linear sum of two subspaces, linear independence and dependence of vectors.

Chapter:1

Unit-II (12 Hrs)

Basis and dimension

Basis of vector space, Finite dimensional vector spaces, Basis extension , Co Ordinates , Dimension of vector space, Dimension of sub space, Quotient set, Dimension of quotient space.

Chapter: 2

Unit-III (12 Hrs)

Linear Transformations

Linear Transformation, Linear operators, Range and null space of linear transformation, Rank and nullity of linear transformations, linear transformations as vectors, product of linear transformations.

Chapter: 3

Unit-IV(12 Hrs)

Matrix

Matrices, Elementary Properties of Matrices, Inverse Matrices, Rank of Matrix, Linear Equations, Characteristic equations, Characteristic Values & Vectors of square matrix, Cayley – Hamilton Theorem.

Chapter: 5&6

Unit-V(12 Hrs)

Inner product space

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Chapter: 7&8

Student Activities

Class room activities: Power point presentations, Assignments.

Library activities: Visit to library and preparation of notes for Assignment problems.

Activities in the seminar, workshops and conferences: Participation/Presentation in seminar/workshop/conference.

Co-Curricular Activities(15 Hours)

Quiz Competitions, Seminars, Group Discussion

Prescribed text book:

A Textbook of B.Sc. Mathematics 3rd Year - Linear Algebra by S Chand Publications

(V. VENKATESWARA RAO, B.V.S.S. SARMA,, N. KRISHNAMURTHY) (2020)

Reference Books :

1. A TEXT BOOK OF B.Sc MATHEMATICS III B,Sc Semester-V by Dr.A.Anjaneyulu
2. Linear Algebra by J.N.Sharma&A.R.Vasishtha,KrishnaPrakashan Media (P) Ltd.
3. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition),New Delhi.
4. Linear Algebra by Stephen H. Friedberg et. al. published by Prentice Hall of India Pvt. Ltd. 4 th Edition, 2007.
- 5.Matrices by Shanti Narayana, published by S.Chand Publications.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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Unit-II

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Unit-III

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Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

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Unit-IV

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Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Understand the subject of various numerical methods that are used to obtain approximate solutions
2. Understand various finite difference concepts and interpolation methods.
3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
4. Find numerical solutions of ordinary differential equations by using various numerical methods.
5. Analyze and evaluate the accuracy of numerical methods.

Unit-I (12 Hrs)

The calculus of finite differences

Introduction, Differences, Difference formulae, Fundamental theorem of the differential calculus, The operator E, Properties of two operators E and δ One or more missing terms, Factorial notation, Methods of representing any given polynomial in factorial notation.

(Chapter: 1.01-1.11)

Interpolation with equal intervals

Introduction, Different interpolation methods. Use of calculus of finite differences;
(Chapter: 2.01-2.02)

Unit-II (12 Hrs)

Interpolation with un equal intervals

Introduction, Divided differences, Properties of divided differences, Newton's formula for unequal intervals (Newton's divided difference interpolation formula), Lagrange's interpolation formula, Lagrange's inverse interpolation formula

(chapter: 3.01-3.04 & 7.00)

Central difference interpolation formulae

Introduction, Gauss forward interpolation formula, Gauss backward interpolation formula, Stirling's formula, Bessel's formula.

(Chapter: 4.01-4.04)

Unit-III (12 Hrs)

Numerical Differentiation:

Introduction, Derivatives using Newton-Gregory forward formula, Newton-Gregory backward formula.

Derivatives using Central difference formula (Stirling's formula & Bessel's formula)

Derivatives with Newton's divided difference formula, Maxima and minimum values of a tabulated function.

Chapter: 5

Unit-IV (12 Hrs)

Numerical integration:

Introduction, A general quadrature formula for equidistant ordinates, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Weddle's rule, The Euler's Maclaurin's summation formula.

Chapter: (6.01 to 6.06 & 6.08)

Unit-V (12 Hrs)

Numerical solution of ordinary differential equations of first order:

Introduction, Picard's method of Successive approximations, Euler's Method, Modified Euler's Method. Taylor's series Method, Runge- Kutta method: R-K method of second order, R-K method of third order, R-K method of fourth order.

Chapter: (11.00 to 11.05 & 11.08)

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Prescribed text book:

Calculus of finite differences and Numerical Analysis by Gupta- Malik.

Reference Books

1. S.S.Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt. Ltd., New Delhi-110001, 2006.
2. P.Kandasamy, K.Thilagavathy, Calculus of Finite Differences and Numerical Analysis. S. Chand & Company, Pvt. Ltd., Ram Nagar, New Delhi-110055.
3. R.Gupta, Numerical Analysis, Laxmi Publications (P) Ltd., New Delhi.
4. H.C Saxena, Finite Differences and Numerical Analysis, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
5. S.Ranganatham, Dr.M.V.S.S.N.Prasad, Dr.V.RameshBabu, Numerical Analysis, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
6. Web resources suggested by the teacher and college librarian including reading material.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

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Unit-III

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Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

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Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

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Unit-IV

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Unit-V

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NOTE:

In part I Examiner may divide 8 marks for their convenience. (i.e 8+0 or 2+6 or 3+5 or 4+4)

CH.SD. ST. THERESA'S COLLEGE FOR WOMEN (A), ELURU

III B.Sc Degree course *Syllabus*

MATHEMATICS, V SEMESTER; PAPER-VII(A)

Mathematical Special Functions

75HRS

(Skill Enhancement Course-ELECTIVE)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations.
2. Find power series solutions of ordinary differential equations.
3. solve Hermite equation and write the Hermite Polynomial of order (degree) n , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.
4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.
5. Solve Bessel equation and write the Bessel equation of first kind of order n , also find the generating function for Bessel function understand the orthogonal properties of Bessel function.

Unit-I (12 Hrs)

Beta and Gamma functions,

Euler's Integrals-Beta and Gamma Functions, Elementary properties of Gamma Functions, Transformation of Gamma Functions, Another form of Beta Function, Relation between Beta and Gamma Functions, Other Transformations.

CHAPTER: 2.9 to 2.15

Chebyshev polynomials

Chebyshev's Differential Equations, Chebyshev polynomials, Relation for $T_n(x)$ and $U_n(x)$, Generating function, Orthogonal properties of Chebyshev polynomials, Recurrence formulae for $T_n(x)$ and $U_n(x)$.

CHAPTER: 8.1 to 8.8

Unit-II (12 Hrs)

HERMITE POLYNOMIALS

Hermite Differential Equations, Solution of Hermite Equation, Hermite's Polynomials, Generating function, Other forms for Hermite Polynomial, To find first few Hermite Polynomials, Orthogonal properties of Hermite Polynomials, Recurrence formulae for Hermite Polynomials.

CHAPTER: 6.1 to 6.8

Unit-III (12 Hrs)

LEGENDRE'S EQUATION

Definition, Solution of Legendre's Equation, Definition of $P_n(x)$ and $Q_n(x)$,

General solution of Legendre's Equation, To show that $P_n(x)$ is the coefficient of h^n in the expansion of $(1-2xh+h^2)^{-1/2}$, Orthogonal properties of Legendre's Equation, Recurrence formula, Rodrigues formula, Associated Legendre's equation, Associated Legendre's function, Properties of the associated Legendre's function, Orthogonal properties of associated Legendre's functions, Recurrence formulae for associated Legendre's functions.

CHAPTER: 2.1 to 2.5 AND 2.7, 2.8 & 2.12

Unit-IV (12 Hrs)

BESSEL'S EQUATION

Definition, Solution of Bessel's General Differential Equations, General solution of Bessel's Equation, Integration of Bessel's equation in series for $n=0$, Definition of $J_n(x)$, Recurrence formulae for $J_n(x)$, Generating function for $J_n(x)$.

CHAPTER: 5.1 to 5.7

Unit-V (12 Hrs)

Power series and Power series solutions of ordinary differential equations

Introduction, A Review of Power series, Series Solutions of First Order Equations, Second order Linear Equations, Ordinary Points, Regular Singular Points.

CHAPTER: 5 (26, 27, 28, 29, 30)

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Prescribed text books:

1. For UNITS-I,II,III&IV -J.N.Sharma and Dr.R.K.Gupta, Special functions, Krishna Prakashan Media(P) Ltd; Meerut.
2. For UNIT-V-George F.Simmons, Differential Equations with Applications and Historical Notes, Second Edition, Tata McGRAW-Hill Edition, 1994

Reference Books

1. Dr.M.D.Raisinghania, Ordinary and Partial Differential Equations, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
 2. Shanti Narayan and Dr.P.K.Mittal, Integral Calculus, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
 3. Shepley L. Ross, Differential equations, Second Edition, John Willy & sons, New York, 1974.
 4. Special Functions- E.D-RamValle(2006)
 5. Special Functions by N.Saran(2002).
 6. Web resources suggested by the teacher and college librarian including reading material
- Note: No Question will be given on finding the general solution of Equations from Units II, III & IV

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Learn multiple integrals as a natural extension of definite integral to a function of two variables in the case of double integral / three variables in the case of triple integral.
2. Learn applications in terms of finding surface area by double integral and volume by triple integral.
3. Determine the gradient, divergence and curl of a vector and vector identities.
4. Evaluate line, surface and volume integrals.
5. understand relation between surface and volume integrals (Gauss divergence theorem), relation between line integral and volume integral (Green's theorem), relation between line and surface integral (Stokes theorem)

Unit – 1: Multiple integrals-I (15h) 1. Introduction, Double integrals, Evaluation of double integrals, Properties of double integrals. 2. Region of integration, double integration in Polar Co-ordinates, 3. Change of variables in double integrals, change of order of integration.

Unit – 2: Multiple integrals-II (15h) 1. Triple integral, region of integration, change of variables. 2. Plane areas by double integrals, surface area by double integral. 3. Volume as a double integral, volume as a triple integral.

Unit – 3: Vector differentiation (15h) 1. Vector differentiation, ordinary derivatives of vectors. 2. Differentiability, Gradient, Divergence, Curl operators, 3. Formulae involving the separators.

Unit – 4: Vector integration (15h) 1. Line Integrals with examples. 2. Surface Integral with examples. 3. Volume integral with examples.

Unit – 5: Vector integration applications (15h) 1. Gauss theorem and applications of Gauss theorem. 2. Green's theorem in plane and applications of Green's theorem. 3. Stokes's theorem and applications of Stokes theorem.

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Reference Books: 1. Dr.MAnitha, Linear Algebra and Vector Calculus for Engineer, Spectrum University Press, SR Nagar, Hyderabad-500038, INDIA. 2. Dr.M.Babu Prasad, Dr.K.KrishnaRao, D.Srinivasulu, Y.AdiNarayana, Engineering Mathematics-II, Spectrum University Press, SR Nagar, Hyderabad-500038, INDIA. 3. V.Venkateswararao, N. Krishnamurthy, B.V.S.S.Sarma and S.AnjaneyaSastry, A text Book of B.Sc., Mathematics Volume-III, S. Chand & Company, Pvt. Ltd., Ram Nagar, New Delhi-110055. 4. R.Gupta, Vector Calculus, Laxmi Publications. 5. P.C.Matthews, Vector Calculus, Springer Verlag publications. 6. Web resources suggested by the teacher and college librarian including reading material

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

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Unit-IV

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Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Evaluate Laplace transforms of certain functions, find Laplace transforms of derivatives and of integrals.
2. Determine properties of Laplace transform which may be solved by application of special functions namely Dirac delta function, error function, Bessel function and periodic function.
3. Understand properties of inverse Laplace transforms, find inverse Laplace transforms of derivatives and of integrals.
4. Solve ordinary differential equations with constant/ variable coefficients by using Laplace transform method.
5. Comprehend the properties of Fourier transforms and solve problems related to finite Fourier transforms.

Unit – 1:Laplace transforms- I (15h)

1. Definition of Laplace transform, linearity property-piecewise continuous function. 2. Existence of Laplace transform, functions of exponential order and of class A. 3. First shifting theorem, second shifting theorem and change of scale property.

Unit – 2:Laplace transforms- II (15h)

1. Laplace Transform of the derivatives, initial value theorem and final value theorem. Laplace transforms of integrals. 2. Laplace transform of $t^n \cdot f(t)$, division by t , evolution of integrals by Laplace transforms. 3. Laplace transform of some special functions-namely Dirac delta function, error function, Bessel function and Laplace transform of periodic function.

Unit – 3:Inverse Laplace transforms (15h)

1. Definition of Inverse Laplace transform, linear property, first shifting theorem, second shifting theorem, change of scale property, use of partial fractions. 2. Inverse Laplace transforms of derivatives, inverse, Laplace transforms of integrals, multiplication by powers of 'p', division by 'p'. 3. Convolution, convolution theorem proof and applications.

Unit – 4:Applications of Laplace transforms (15h)

1. Solutions of differential equations with constants coefficients, solutions of differential equations with variable coefficients. 2. Applications of Laplace transforms to integral equations-Abel's integral equation. 3. Converting the differential equations into integral equations, converting the integral equations into differential equations.

Unit – 5:Fourier transforms (15h)

1. Integral transforms, Fourier integral theorem (without proof), Fourier sine and cosine integrals. 2. Properties of Fourier transforms, change of scale property, shifting property, modulation theorem. Convolution. 3. Convolution theorem for Fourier transform, Parseval's Identify, finite Fourier transforms.

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Reference Books:

1. Dr. S.Sreenadh, S.Ranganatham, Dr.M.V.S.S.N.Prasad, Dr. V.RameshBabu, Fourier series and Integral Transforms, S. Chand & Company, Pvt. Ltd., Ram Nagar, New Delhi-110055.
2. A.R. Vasistha, Dr. R.K. Gupta, Laplace Transforms, Krishna Prakashan Media Pvt. Ltd. Meerut.
3. M.D.Raisinghania, H.C. Saxsena , H.K. Dass, Integral Transforms, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
4. Dr. J.K. Goyal, K.P. Gupta, Laplace and Fourier Transforms, PragathiPrakashan, Meerut.
5. ShanthiNarayana , P.K. Mittal, A Course of Mathematical Analysis, S. Chand & Company Pvt.Ltd. Ram Nagar, New Delhi-110055.
6. Web resources suggested by the teacher and college librarian including reading material

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

CH.SD. ST. THERESA'S COLLEGE FOR WOMEN (A), ELURU

III B.Sc Degree course *Syllabus*

MATHEMATICS, V SEMESTER; PAPER-VI(C)

Partial differential equations & Fourier series 75Hrs

(Skill Enhancement Course-ELECTIVE)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Classify partial differential equations, formation of partial differential equations and solve Cauchy's problem for first order equations.
2. Solve Lagrange's equations by various methods, find integral Surface passing through a given curve and Surfaces orthogonal to a given system of Surfaces.
3. Find solutions of nonlinear partial differential equations of order one by using Char pit's method.
4. Find solutions of nonlinear partial differential equations of order one by using Jacobi's method.
5. Understand Fourier series expansion of a function $f(x)$ and Parseval's theorem.

Unit – 1: Introduction of partial differential equations (15h)

1. Partial Differential Equations, classification of first order partial differential equations, Rule I, derivation of a partial differential equations by the elimination of arbitrary constants
2. Rule II, derivation of a partial differential equation by the elimination of arbitrary function ϕ from the equations $\phi(u, v) = 0$ where u and v are functions of x, y and z .
3. Cauchy's problem for first order equations

Unit – 2: Linear partial differential equations of order one (15h)

1. Lagrange's equations, Lagrange's method of solving $Pp + Qq = R$, where P, Q and R are functions of x, y and z , type 1 based on Rule I for solving $dx p = dy Q = dz R$, type 2 based on Rule II for solving $dx p = dy Q = dz R$.
2. Type 3 based on Rule III for solving $dx p = dy Q = dz R$, type 4 based on Rule IV for Solving $dx p = dy Q = dz R$.
3. Integral Surface passing through a given curve, the Cauchy problem, Surfaces orthogonal to a given system of Surfaces.

Unit – 3: Non-linear partial differential equations of order one-I (15h)

1. Complete integral, particular integral, singular integral and general integral, geometrical interpretation of integrals of $f(x, y, z, p, q) = 0$, method of getting singular integral from the PDE of first order, compatible system of first order equations.
2. Char pit's method, Standard form I, only p and q present.
3. Standard form II, Clairaut equations.

Unit – 4: Non-linear partial differential equations of order one-II (15h)

1. Standard Form III, only p, q and z present.
2. Standard Form IV, equation of the form $f_1(x, p) = f_2(y, q)$.
3. Jacobi's method, Jacobi's method for solving partial differential equations with three or more independent variables, Jacobi's method for solving a non-linear first order partial differential equations in two independent variables.

Unit – 5:Fourier series (15h)

1. Introduction, Euler's formulae for Fourier series expansion of a function $f(x)$, Dirichlet's conditions for Fourier series, convergence of Fourier series.
2. Functions having arbitrary periods. Change of interval, Half range series.
3. Parseval's theorem, illustrative examples based on Parseval's theorem, some particular series.

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Reference Books:

1. Dr.M.D.Raisinghania, Ordinary and Partial Differential Equations, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
2. Dr. S.Sreenadh, S.Ranganatham, Dr.M.V.S.S.N.Prasad, Dr. V.RameshBabu, Fourier Series and Integral Transforms, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi-110055.
3. Prof T.Amaranath, An Elementary Course in Partial Differential Equations Second Edition, Narosa Publishing House, New Delhi.
4. Fritz John, Partial Differential Equations, Narosa Publishing House, New Delhi, 1979.
5. I.N.Sneddon, Elements of Partial Differential Equations by McGraw Hill, International Edition, Mathematics series.
6. Web resources suggested by the teacher and college librarian including reading material.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

CH.SD. ST. THERESA'S COLLEGE FOR WOMEN (A), ELURU

III B.Sc Degree course *Syllabus*

MATHEMATICS, V SEMESTER; PAPER-VII(C)

Number theory

75HRS

(Skill Enhancement Course-ELECTIVE)

Learning Outcomes:

Students after successful completion of the course will be able to

1. Find quotients and remainders from integer division, study divisibility properties of integers and the distribution of primes.
2. Understand Dirichlet multiplication which helps to clarify interrelationship between various arithmetical functions.
3. Comprehend the behaviour of some arithmetical functions for large n .
4. Understand the concepts of congruencies, residue classes and complete residue systems.
5. Comprehend the concept of quadratic residues mod p and quadratic non residues mod p .

Unit – 1: Divisibility (15h)

1. Introduction, Divisibility, Greatest Common Divisor.
2. Prime numbers, The fundamental theorem of arithmetic, The series of reciprocals of the primes.
3. The Euclidean algorithm, The greatest common divisor of more than two numbers.

Unit – 2: Arithmetical Functions and Dirichlet Multiplication (15h)

1. Introduction, The Mobius function $\mu(n)$, The Euler totient function $\phi(n)$, A relation connecting ϕ and μ , A product formula for $\phi(n)$.
2. The Dirichlet product of arithmetical functions, Dirichlet inverses and Mobius inversion formula, The Mangoldt function $\Lambda(n)$.
3. Multiplicative functions, Multiplicative functions and Dirichlet multiplication, The inverse of a completely multiplicative function, Liouville's function $\lambda(n)$, The divisor functions $\sigma_\alpha(n)$.

Unit – 3: Averages of Arithmetical Functions (15h)

1. Introduction, The big oh notation. Asymptotic equality of functions, Euler's summation formula, some elementary asymptotic formulas.
2. The average order of $d(n)$, The average order of the divisor functions $\sigma_\alpha(n)$, The average order of $\phi(n)$.
3. The average order of $\mu(n)$ and $\Lambda(n)$, The partial sum of a Dirichlet product, Applications of $\mu(n)$ and $\Lambda(n)$.

Unit – 4: Congruences (15h)

1. Definition and basic properties of congruences, Residue classes and complete residue systems.

2. Linear congruences, reduced residue systems and the Euler-Fermat theorem. Polynomial congruences modulo p . Lagrange's theorem.

3. Applications of Lagrange's theorem, Simultaneous linear congruences. The Chinese remainder theorem. Applications of the Chinese remainder theorem.

Unit – 5: Quadratic Residues and the Quadratic Reciprocity Law (15h)

1. Quadratic Residues, Legendre's symbol and its properties, Evaluation of $(-1/p)$ and $(2/p)$, Gauss lemma,

2. The Quadratic reciprocity law, Applications of the reciprocity law, The Jacobi Symbol.

3. Gauss sums and the quadratic reciprocity law, the reciprocity law for quadratic Gauss sums. Another proof of the quadratic reciprocity law.

Co-Curricular Activities (15 Hours)

Assignments, Quiz Competitions, Seminars, Group Discussions/Debates, Field work/Project work, collection of data.

Visits to research organizations, Statistical Cells, Universities, ISI etc.

Invited lectures and presentations on related topics by experts in the specified area.

Reference Books:

1. Tom M. Apostol, Introduction to Analytic Number theory, Springer International Student Edition.

2. David, M. Burton, Elementary Number Theory, 2nd Edition UBS Publishers.

3. Hardy & Wright, Number Theory, Oxford Univ, Press.

4. Dence, J. B & Dence T.P, Elements of the Theory of Numbers, Academic Press. 5. Niven, Zuckerman & Montgomery, Introduction to the Theory of Numbers.

6. Web resources suggested by the teacher and college librarian including reading material.

Pattern of theory Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Part-I (5x8=40)

It consist of 10 long answer type questions (2 questions set from each unit)

The student has to answer 5 questions, choosing one question from each unit. Each question carries 8 marks.

Unit-I

1. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

2. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-II

3. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

4. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-III

5. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

6. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-IV

7. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

8. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Unit-V

9. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

(OR)

10. $\left. \begin{array}{l} a) \\ b) \end{array} \right]$

Part-II (10x1=10 Marks)

It consists of 10 very short answer questions (2 from each unit) and the students write all 10 questions. Each question carries 1 mark.

Unit-I

1.

2.

Unit-II

3.

4.

Unit-III

5.

6.

Unit-IV

7.

8.

Unit-V

9.

10.

NOTE:

In part I Examiner may divide 8 marks for their convenience . (i.e 8+0 or 2+6 or 3+5 or 4+4)

Evaluation Pattern for Theory (100 Marks)

Internal Assessment:	50Marks
Semester End:	50Marks
Total of Two Internals (Each internal 15 Marks):	30Marks
Seminar/Assignment/Quiz/Problem Solving	:15 Marks
Attendance	:05Marks

Evaluation Pattern for Practicals (50Marks)

Internal Assessment:	25Marks
Semester End:	25Marks
Paper setters are confined to record submitted by the student.	

Pattern of Practical Question Paper(Internal)

Section-A (5x5=25)

It consist of 8 questions (1 Question from each Practical)

The student has to answer 5 questions choosing from 8 Questions. Each question carries 5 marks.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

PRACTICAL LIST

It Contains 8 (or 9) Practicals.

Each Unit contains at most 2 Practicals.

Each practical contains 5(or 6) Problems.

Marks Division for Practicals (50Marks)

Record - 10 Marks

Viva Voce - 10 Marks

Written Exam - 30 Marks (5 x 6)

Pattern of Practical Question Paper

Duration of the examination : 3 hours Max. Marks : 50

Section-A (5x6=30)

It consist of 8 questions (1 Question from each Practical)

The student has to answer 5 questions choosing from 8 Questions. Each question carries 6 marks.

1.

2.

3.

4.

5.

6.

7.

8.

CH.SD. ST. THERESA'S COLLEGE FOR WOMEN(A), ELURU

UG-LIFE SKILL course *Syllabus*

ANALYTICAL SKILLS(AS)

30HRS 2HR/WK CREDITS-2

SEM END EXAM(2HRS)

50 MARKS

Course Objective:

Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes:

After successful completion of this course, the student will be able to;

- Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
- Acquire competency in the use of verbal reasoning.
- Apply the skills and competencies acquired in the related areas
- Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

UNIT – 1: (10 Hrs)

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD(HCF). Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – 2: (10 Hrs)

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance-speed. Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT – 3: (07 Hrs)

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, line Graphs. Venn diagrams.

Recommended Co-Curricular Activities (03 Hrs)

Surprise tests / Viva-Voice / Problem solving/Group discussion.

Text Book:

Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.Chand Publications.

Reference Books:

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar, New Delhi-110055.
2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
3. Quantitative Aptitude for Competitive Examination by AbhijitGuha, Tata McGraw Hill Publications.

DEPARTMENT OF STATISTICS

The meeting of the Board of Studies in Statistics was held on Saturday, 23.02.2021 at 10.00 a.m. in Zoom cloud meeting .

MEMBERS:

1. Dr.Sr.Marietta D'Mello., Principal

University Nominee:

2. Mrs. Dr.N.Madhavi, Govt. Degree College, Rajahmundry.

Subject Experts:

- 3.Mr.K.Ashok ,Hod of Statistics , P.R. Govt. College, Kakinada
4. Dr.Mrs.D.Madhupalathi,HOD of Economics.
5. Mrs.S.Naga Durga , Hod of Mathematics & Statistics

Faculty:

1. Mrs.G.Kusuma , Lect.in Statistics
2. Ms. R.Sravani, Lect.in Statistics

Resolutions:

The Existence syllabi of 1st to 6th semesters were review after through discussion the board decided to follow existence syllabi and whenever we received the syllabi from Apche we will consider and follow.

**Ch.S.D.St.Theresa's Autonomous College for women, Eluru.
CBCS B.A/B.Sc. Statistics course structure W.E.F (2020-21)**

Year	Semester	Paper	Subject	Hours	Credits	I.A	S.E	Total
I	I	I	Descriptive statistics & Probability	6	5	50	50	100
	II	II	Mathematical Expectations & Probability Distributions	6	5	50	50	100
II	III	III	Statistical Methods and theory of Estimation	6	5	50	50	100
	IV	IV	Testing of Hypothesis	6	5	50	50	100
III	V	V	Sampling & ANOVA	6	5	50	50	100
		VI	Operations research	6	5	50	50	100
	VI	VII	A) Applied Statistics using R-Programming (OR) B) Demography & vital Statistics	6	5	50	50	100
		VIII	A1: Quality & Reliability	6	5	50	50	100
			A2: Designs of Experiments A3: Project work / Self study /MOOCS (OR) B1: Forecasting methods B2: Actuarial Statistics B3: Project work / Self study/ MOOCS					

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I BSC I SEMESTER STATISTICS SYLLABUS (W.E.F. 2020-21)
Paper- I: DESCRIPTIVE STATISTICS & PROBABILITY

UNIT-I

Concept of primary and secondary data. Methods of collection & editing of primary data. Designing a questionnaire and schedule. Measures of central tendency - Mean, Median, Mode, Geometric mean and Harmonic mean.

UNIT-II

Measures of dispersion: range, quartile deviation mean deviation and standard deviation. Central and non-central moments and their interrelationship. Sheppard's corrections from moments. Skewness based on quartiles and moments and kurtosis based on moments.

UNIT-III

Basic concepts of probability –random experiments, trial, outcome, sample space, mutually exclusive and exhaustive events and, equally likely and favorable outcomes. Mathematical, statistical and axiomatic definitions of probability. Conditional probability and independence of events.

UNIT-IV

Addition and multiplication theorems of probability for 2 events and for n events, Boole's inequality and Baye's theorems.

UNIT-V

Definition of random variable, discrete and continuous random variables, functions of random variable, probability mass function and probability density function, Distribution function and its properties.

Bivariate random variable - meaning, joint, marginal conditional distributions. Independence of random variables.

Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao, Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Paper- II: MATHEMATICAL EXPECTATIONS & PROBABILITY DISTRIBUTIONS

UNIT-I

Mathematical Expectations: Mathematical expectation(ME) of a random variable and function of a random variable. moments and covariance using mathematical expectation with examples. Addition and multiplication theorems of expectation. Definition of moment generating function (M.G.F), Cummulant generating function (C.G.F), probability generating function (P.G.F) and C.F statements of their properties. Chebychev's and Cauchy – Schwartz's inequalities.

UNIT-II

Discrete distributions: Binomial and Poisson distributions, their definitions, 1st to 4 central moments, M.G.F, C.G.F, P.G.F, C.F, Mean and Variance, Reproductive property wherever exists. Poisson approximation to Binomial.

UNIT-III

Negative Binomial, Geometric and Hyper Geometric distributions – definitions, Mean and Variance, M.G.F, C.G.F, P.G.F, C.F, Reproductive property wherever exists. Binomial approximation to Hyper Geometric, Poisson approximation to Negative binomial distribution.

UNIT-IV

Continuous distributions: Rectangular, Exponential, Gamma, Beta distributions of two kinds. Other Properties such as mean, variance, M.G.F, C.G.F, C.F, reproductive property wherever exists.

UNIT- V

Normal Distributions : Definition, Importance, properties, M.G.F, reproductive property, Interrelation between Normal and Binomial, Normal and Poisson distribution. Cuchy distribution.

Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao, Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Paper- III : Statistical Methods and theory of Estimation

UNIT-I

Correlation & Regression: Population correlation coefficient and its properties. Bivariate data scattered diagram. Sample correlation coefficient. Computation of correlation coefficient for grouped data. Correlation ratio. Spearman's rank correlation coefficient and its properties, simple linear regression. Correlation verses regression. Properties of regression coefficients. Fitting of quadratic and power curves. Concepts of partial and multiple correlation coefficients (only for three variables).

UNIT-II

Curve Fitting: Principle of least squares, fitting of Straight line, second degree parabola, and Exponential, Power curves by using principle of least squares.

UNIT-III

Theory of Attributes: Analysis of categorical data. Independence and Association and partial association of attributes. Consistency of data, conditions for consistency of two and three attributes cases. Various measures of association- Yule's coefficient of association, coefficient of colligation for two way data and relation between them.

UNIT-IV

Exact Sampling Distribution: Concepts of population, parameter, random sample. Statistic, sampling distribution and standard error. Standard error of sample mean(s) and sample proportion(s). Exact sampling distributions – statement and properties of χ^2 , t and F distributions and their interrelationships. Independence of sample mean and variance in random sampling from normal distribution.

UNIT-V

Theory of Estimation: Point estimation of a parameter, concept of bias and mean square error of an estimate. Criteria of good estimator – consistency, unbiasedness, efficiency and sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions. Estimation by method of moments, Maximum likelihood (ML), statements of asymptotic properties of MLE. Concept of interval estimation. Confidence intervals of the parameters of normal population by pivot method.

Text Book:

1. Dr. T.C.Ravi Chandra kumar, Dr. R. Sudhakar Reddi, Sri A. Mohan Rao, Sri, S. Srinivasa Rao, Statistics Paper II - Statistical Methods and Inference, Academy.

Books for Reference:

1. V.K.Kapoor and S.C.Gupta, Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi.
2. Goon AM, Gupta MK, Das Gupta B, Outlines of Statistics, Vol-II, the World Press Pvt.Ltd., Kolakota.
3. Sanjay Arora and Bansi Lal, New Mathematical Statistics Satya Prakashan, New Delhi.
4. Parimal Mukhopadhyay, Mathematical Statistics, New Central Book agency.
5. Levin, Stephan, Krehbiel, Berenson, Statistics for Managers using Microsoft Excel, 4 th edition, Pearson Publication

Paper-IV: Testing of Hypothesis

UNIT-I

Testing of Hypothesis: Concepts of Statistical Hypothesis. Null and alternative hypothesis. Critical region, two types of errors, level of significance and power of a test. One and two tailed tests, test function (non-randomized and randomized). Neymann -Pearson's fundamental lemma for Randomized tests. Example in case of Binomial, Poisson, Exponential and Normal distributions and their powers. Use of central limit theorem in testing.

UNIT-II

Large Sample Theory: Large sample tests and confidence intervals for Mean(s), Proportion(s), Standard deviation(s) and Correlation coefficient(s).

UNIT-III

Small Sample Theory: Tests of significance based on t for single mean, equality of two means, and difference of two means (paired t-test), single correlation coefficient and two correlation coefficients. F-test for testing variances.

UNIT-IV

Test of significance based on χ^2 test, χ^2 test for goodness of fit (in case binomial and poisson) and test for independence of attributes. Definition of order statistics and statement of their distributions.

UNIT-V

Non Parametric Tests: Non-parametric test advantages and disadvantages, Comparison with parametric tests. Measurement scale-nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). two independent sample tests: Median test, Wilcoxon-Mann-Whitney U test, Wald Wolfowitz's runs test.

Text Book:

1. Dr. T.C.Ravi Chandra kumar, Dr. R. Sudhakar Reddi, Sri A. Mohan Rao, Sri, S. Srinivasa Rao, Statistics Paper II - Statistical Methods and Inference, Academy.

Books for Reference:

1. V.K.Kapoor and S.C.Gupta, Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi.
2. Goon AM, Gupta MK, Das Gupta B, Outlines of Statistics, Vol-II, the World Press Pvt.Ltd., Kolakota.
3. Sanjay Arora and Bansilal, New Mathematical Statistics Satya Prakashan, New Delhi.
4. Parimal Mukhopadhyay, Mathematical Statistics, New Central Book agency.
5. Levin, Stephan, Krehbiel, Berenson, Statistics for Managers using Microsoft Excel, 4th edition, Pearson Publication

Paper-V: Sampling & ANOVA

UNIT-I

Basic concepts of sampling: Concepts of population, sample, sampling unit, parameter, statistic, sampling errors, sampling distribution, sample mean and standard error, principle steps in sample surveys need for sampling, census versus, sampling and non-sampling error. Sources and treatment of non sampling errors. Advantages and limitations of sampling.

UNIT-II

Types of sampling: subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total and proportion, their variances and the estimates of variances in the following methods.
SRSWR and SRSWOR.

UNIT-III

Stratified random sampling with proportional and optimum allocation.

Systematic sampling when N, nk .

Comparison of relative efficiencies advantages and disadvantages of above methods of sampling.

UNIT-IV

Analysis of Variance: ANOVA – one way and two way classifications with one observation per cell-concept of Gauss Mark Off linear model, statement of Cochran's theorem. Concept of fixed effect model and random effect model. Expectations of various sums of squares. Mathematical analysis, importance and applications.

UNIT-V

Analysis of Covariance (ANCOVA): Analysis of covariance for a one-way classification with one concomitant variable in C.R.D. Layout and for two-way classification with one concomitant variable in R.B.D.

Text Books:

- 1.Telugu Academy BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference Books:

- 1.Fundamentals of applied statistics : VK Kapoor and SC Gupta.
- 2.Indian Official statistics - MR Saluja.
- 3.Anuvarthita Sankyaka Sastram - Telugu Academy.

Paper-VI: OPERATIONS RESEARCH

UNIT-I

Linear Programming: Meaning and scope of OR. Convex sets and their properties. Definition of general LPP, formulation of LPP, solution of LPP by graphical method, fundamental theorem of LPP, simplex algorithm. Concept of artificial variables. BIG-M/Penalty method and two phase simplex method. Concept of degeneracy and resolving it.

UNIT-II

Duality: Concept of duality, duality as LPP. Dual primal relationship. Statement of fundamental theorem of duality, Dual simplex method.

UNIT-III

Transportation Problems: Definition of transportation problem, TPP as a special case of LPP, feasible solutions by North-West and Matrix minimum methods and VAM. Optimal solution through MODI tableau and stepping stone method for balanced and unbalanced transportation problem. Degeneracy in TP and resolving its.

UNIT-IV

Transshipment problem, formulation and description of Assignment problem and its variations. Assignment problem as special case of TP and LPP, unbalanced assignment problem, optimal solution using Hungarian method.

UNIT-V

Traveling salesman problem, Problem of Sequencing Optimal sequence of N jobs on two and three machines without passing to find processing times of jobs, total elapsed time and idle times of machines.

Text Books:

- 1.Kanti swaroop, P.K.Guptha and Man Mohan: Operation Research. Sultan Chand.
2. BA/BSc III Year paper - IV Statistics - quality, reliability and operations Research-
Telugu Academy by Dr T.C.Ravichandra Kumar, Dr R.V.S.Prasad, Dr D.Giri,
Dr G.S.Devasena.
- 3.Operation Reach – S.D.Sharma.

List of reference books

- 1..S.K Sinha: Reliability and life testing. Wiley Eastern.
- 2.Operations researchHh - Models and methods by Chandrasekar Salimath, Bhupendar Parashar.
- 3.Operation Research – Taha

CH.S.D.ST.THERESA'S UTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS (W.E.F 2020-21)
PAPER- VII(A): APPLIED STATISTICS USING R -PROGRAMMING

UNIT-I

Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares, moving average methods.

UNIT-II

Growth curves and their fitting. Modified exponential. Gompertz and logistic curves. Determination of seasonal indices by ratio to moving average, ratio to trend and link relative's methods.

UNIT-III

Index Numbers: Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyer's, Paasche's and Fisher's index numbers. Criterion of a good index numbers, problems involved in the construction of index numbers. Fisher's index as ideal index number. Fixed and chain base index numbers. Cost of living index numbers and whole sale price index numbers. Base shifting, slicing and deflation of index numbers.

UNIT-IV

Descriptive Statistics in R

Introducing to R, Application of Data Science, R Data Structures, Help functions in R. Lists, Creating Lists, General List Operations, Assessing List Components and Values, Applying Functions to Lists, Recursive Lists, Creating Data Frames, Matrix, Like Operations in Frames, Merging Data Frames, Applying Functions to Data Frames, summary of the data.

UNIT-V

Data Visualization & Analysis with R

Experimental Design, Data Attributes, Data Cleaning, Data Characterization and Analysis. Data Modeling and Mining Techniques, Model Evolution, Visualization, Linear regression, Correlation.

Text Books:

1. Telugu Academy BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference Books:

1. Fundamentals of applied statistics : VK Kapoor and SC Gupta.
2. Indian Official statistics - MR Saluja.
3. Anuvarthita Sankhyaka Sastram - Telugu Academy.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS (W.E.F 2020-21)
PAPER- VII (B): DEMOGRAPHY & VITAL STATISTICS

UNIT I

Population Theories: Coverage and content errors in demographic data, use of balancing equations and Chandrasekharan-Deming formula to check completeness of registration data. Adjustment of age data, use of Myer and UN indices, Population composition, dependency ratio.

UNIT II

Introduction and sources of collecting data on vital statistics, errors in census and registration data. Measurement of population, rate and ratio of vital events. Measurements of Mortality: Crude Death Rate (CDR), Specific Death Rate (SDR), Infant Mortality, Rate (IMR) and Standardized Death Rates.

UNIT III

Stationary and Stable population, Central Mortality Rates and Force of Mortality. Life(Mortality) Tables: Assumption, description, construction of Life Tables and Uses of Life Tables.

UNIT IV

Abridged Life Tables; Concept and construction of abridged life tables by Reed-Merrell method, Greville's method and King's Method. Measurements of Fertility: Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR) and Total Fertility Rate (TFR).

UNIT-V

Measurement of Population Growth: Crude rates of natural increase, Pearl's Vital Index, Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR).

SUGGESTED READING:

1. Mukhopadhyay P. (1999): Applied Statistics, Books and Allied (P) Ltd.
2. Gun, A.M., Gupta, M.K. and Dasgupta, B. (2008): Fundamentals of Statistics, Vol. II, 9th Edition, World Press.
3. Biswas, S. (1988): Stochastic Processes in Demography & Application, Wiley Eastern Ltd.
4. Croxton, Fredrick E., Cowden, Dudley J. and Klein, S. (1973): Applied General Statistics, 3rd Edition. Prentice Hall of India Pvt. Ltd.
5. Keyfitz N., Beckman John A.: Demogrphy through Problems S-Verlag New york.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS – CLUSTERS (W.E.F 2020-21)
PAPER- VIII (A1) : Quality & Reliability

UNIT-I

Importance of SQC in industry. Statistical basis of She-wart control charts. Construction of control charts for variables (mean, range and standard deviation)

Interpretation of control charts. Natural tolerance limits and specification limits.

UNIT-II

Construction of control charts for attributes (p, np and c charts with fixed and varying sample sizes). Interpretation of control charts, Process capability index. Concept of six sigma and its importance.

UNIT-III

Acceptance Sampling Plans: Producers risk and consumer's risk. Concept of AQL and LTPD. Single and double sampling plans for attributes and derivation of their OC and ASN functions. Design of single and double sampling plans for attributes using Binomial.

UNIT-IV

Reliability: Introduction, Hazard function, Exponential distribution as life model, its memory-less property. Concepts of censoring and truncation.

UNIT-V

Reliability function and its estimation. System reliability-series, parallel and k out of N systems and their reliabilities.

Text Books:

1. BA/BSc III year paper - IV Statistics - applied statistics - Telugu academy by Prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.
2. Fundamentals of applied statistics : VK Kapoor and SC Gupta
3. S.K Sinha: Reliability and life testing. Wiley Eastern.

Reference Books :

- 1.. R.C.Gupta: Statistical Quality Control.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS – CLUSTERS (W.E.F 2020-21)
PAPER- VIII (A2): Designs of Experiments

Unit-I

Design of experiments: Principles of experimentation, analysis of completely randomized design (C.R.D), Randomized Block Design (R.B.D), and Latin Square Design (L.S.D), including one missing observation, expectation of various sums of squares. Comparison of efficiencies of above designs.

Unit-II

Missing plot technique: Analysis of Randomized Block Design (R.B.D) with one and two missing observations and Latin Square Design (L.S.D) with one missing observation.

Unit-III

Balanced Incomplete Block design (BIBD) and Partially Incomplete block design (PBIBD).

Unit-IV

Factorial Design: Estimation of main effects, interactions and analysis of 2^2 , 2^3 & 2^4 .

Unit-V

2^5 & 2^n , 3^2 , 3^3 factorial experiments and confounding.

Books for Reference:

1. S.C. Gupta and V.K.Kapoor, *Fundamentals of Applied Statistics*, Sultan Chand and sons.
2. Das, M.N. and N.C. Giri, *Design and Analysis of Experiments*, 2nd edition, New Age International (P) Limited Publishers, 1986.
3. Montgomery, D.C: *Design of Analysis of Experiments*, John Wiley.
4. Murthy, M.N., *Sampling theory and methods*, Tata McGraw Hill, New Delhi, 1967.
5. Des Raj, *Sampling Theory*, Tata McGraw Hill, New Delhi, 1976.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS – CLUSTERS (W.E.F 2020-21)
PAPER- VIII (B1): Forecasting Methods

Unit-I

Smoothing Methods: Averaging methods, exponential smoothing methods, a comparison of methods, general aspects of smoothing methods

Unit-II

Decomposition methods: Trend fitting, the ratio-to moving averages classical Decomposition method, different types of moving averages.

Unit-III

Models for time series data:

Auto-covariance and auto correlation functions, stationary processes, white noise processes, moving average (MA) processes, auto regressive (AR) processes, Auto regressive and moving average (ARMA) processes, Auto regressive integrated and moving average (ARIMA) processes.

Unit-IV

Box-Jenkins Models: Identification, Estimation and diagnostic checking for the Models Simulation and Monto Carlo methods

Unit-V

Application of Time-series analysis: Determining randomness of data, Examining stationery of a time series, removing non-stationarity in a time series, recognizing seasonality in a time series.

List of Reference Books:

1. Box, G.E.P, and Jenkins, G.M(1976) Time Series Analysis-Forecasting and control, Holden-dav, San Francisco
2. Anderson, T.W (1971). The statistical Analysis of time series, Wiley,N.V
Montgomery, D.C. and Johnson, L.A.(1977). Forecasting and Time series Analysis, MC Grawhill.
3. Kendall, Sir Maurice and Ord, J.K.(1990). Time series Arnold (Third Edition), Edward
4. Forecasting methods by Makridakis
5. V.K.Kapoor and S.C.Gupta: Fundamentals of Applied Statistics. Sultan Chand
6. Parimal Mukhopadhyay: Applied Statistics. New Central Book agency

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
III BSC VI SEMESTER STATISTICS SYLLABUS – CLUSTERS (W.E.F 2020-21)
PAPER- VIII (B2): Actuarial Statistics

UNIT I

Introductory Statistics and Insurance Applications: Discrete, continuous and mixed probability distributions. Insurance applications, sum of random variables. Utility theory: Utility functions, expected utility criterion, types of utility function, insurance and utility theory.

UNIT II

Principles of Premium Calculation: Properties of premium principles, examples of premium principles. Individual risk models: models for individual claims, the sum of independent claims, approximations and their applications.

UNIT III

Survival Distribution and Life Tables: Uncertainty of age at death, survival function, time-until-death for a person, curate future lifetime, force of mortality, life tables with examples, deterministic survivorship group, life table characteristics, assumptions for fractional age, some analytical laws of mortality.

UNIT IV

Life Insurance: Models for insurance payable at the moment of death, insurance payable at the end of the year of death and their relationships. Life annuities: continuous life annuities, discrete life annuities, life annuities with periodic payments. Premiums: continuous and discrete premiums.

SUGGESTED READING:

1. Dickson, C. M. D. (2005): Insurance Risk And Ruin (International Series On Actuarial Science), Cambridge University Press.
2. Bowers, N. L., Gerber, H. U., Hickman, J. C., Jones, D. A. And Nesbitt, C. J. (1997): Actuarial Mathematics, Society Of Actuaries, Itasca, Illinois, U.S.A.

B.Sc PHYSICS
Syllabus : 2022-2023

Semester - I
Physics -I

Mechanics, Waves&Oscillations

➤ **UNIT-I:**

1. Mechanics of Particle (5hrs)

Review of Newton's Laws of Motion, Motion of variable mass system, Motion of a rocket, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering-Derivation.

2. Mechanics of Rigid bodies (7hrs)

Rigid body, rotational kinematic relations, Equation of motion for a rotating body,

Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Gyroscope, Precession of atom and nucleus in magnetic field, Precession of the equinoxes

➤ **Unit-II:**

3. Motion in a Central Force Field (12hrs)

Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under central force, Kepler's laws of planetary motion - Proofs, Motion of satellites, Basic idea of Global Positioning System (GPS), weightlessness, Physiological effects of astronauts

➤ **UNIT-III:**

4. Relativistic Mechanics (12hrs)

Introduction to relativity, Frames of reference, Galilean transformations, absolute frames, Michelson-Morley experiment, negative result, Postulates of Special theory of

relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation

➤ **Unit-IV:**

5. Undamped, Damped and Forced Oscillations: (07hrs)

- Simple harmonic oscillator and solution of the differential equation, Damped harmonic oscillator, Forced harmonic oscillator – Their differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor.

6. Coupled Oscillations: (For Assignment)(05hrs)

Coupled oscillators -

Introduction, Two coupled oscillators, Normal coordinates and Normal modes - N-coupled oscillators and wave equation

➤ **Unit-V:**

7. Vibrating Strings: (07hrs)

Transverse wave propagation along a stretched string, General solution of wave equation and its significance, Modes of vibration of stretched string clamped at ends, Overtones and Harmonics, Melde's strings.

8. Ultrasonics: (05hrs)

Ultrasonics, General Properties of ultrasonic waves, Production of ultrasonics by piezoelectric and magnetostriction methods, Detection of ultrasonics, Applications of ultrasonic waves, SONAR

REFERENCE BOOKS:

- B.Sc. Physics, Vol. 1, Telugu Academy, Hyderabad
- Fundamentals of Physics Vol. I - Resnick, Halliday, Krane, Wiley India 2007
- College Physics - I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
- University Physics - F.W. Sears, M.W. Zemansky & H.D. Young, Narosa Publications, Delhi
- Mechanics, S.G. Venkatachalapathy, Margham Publication, 2003.

- Waves and Oscillations. N. Subramanyam and Brijlal, Vikas Publications.
- Unified Physics - Waves and Oscillations, Jai Prakash Nath & Co. Ltd.
- Waves & Oscillations. S. Badami, V. Balasubramanian & K. R. Reddy, Orient Longman.

Practical – I (any SIX of the following)

1. Volume resonator experiment
2. Determination of 'g' by compound bar pendulum
3. Simple pendulum - normal distribution of errors - estimation of time period and the error of the mean by statistical analysis
4. Determination of the force constant of a spring by static and dynamic method
5. Coupled oscillators
6. Rigidity modulus of material of a wire - Dynamic method (Torsional pendulum)
7. Young's modulus of the material a bar (scale) by non-uniform bending
8. Viscosity of liquid by the flow method (Poiseuille's method)

Semester - II

Physics–II

WAVE OPTICS

➤ UNIT-I

• Interference of light: (12hrs)

Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Phase change on reflection - Stokes' treatment, Lloyd's single mirror, Interference in thin films: Plane parallel and wedge-shaped films, colours in thin films, Newton's rings in reflected light - Theory and experiment, Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.

➤ UNIT-II

• Diffraction of light: (12hrs)

Introduction, Types of diffraction: Fresnel and Fraunhofer diffractions, Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, Plane diffraction grating, Determination of wavelength of light using diffraction grating, Resolving power of grating, Fresnel's half period zones, Explanation of rectilinear propagation of light, Zone plate, comparison of zone plate with convex lens.

➤ UNIT-III

• Polarisation of light: (12hrs)

Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light - Production and detection, Optical activity, Laurent's half shade polarimeter: determination of specific rotation, Basic principle of LCDs

➤ UNIT-IV

• Aberrations (Assignment) and Fibre Optics: (12hrs)

Monochromatic aberrations, Spherical aberration, Methods of minimizing spherical aberration, Coma, Astigmatism and Curvature of field, Distortion; Chromatic aberration - the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by a distance.

Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber optic communication.

➤ **UNIT-V**

• **Lasers and Holography:** **(12hrs)**

Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers; Holography: Basic principle of holography, Applications of holography

➤ **REFERENCE BOOKS:**

- BSc Physics, Vol.2, Telugu Academy, Hyderabad
- A Text Book of Optics - N Subramanyam, L Brijlal, S. Chand & Co.
- Optics - Murugesan, S. Chand & Co.
- Unified Physics Vol. II Optics, Jai Prakash Nath & Co. Ltd., Meerut
- Optics, F.A. Jenkins and H.G. White, McGraw-Hill
- Optics, Ajoy Ghatak, Tata McGraw-Hill.
- Introduction of Lasers - Avadhanulu, S. Chand & Co.
- Principles of Optics - B.K. Mathur, Gopala Printing Press, 1995

Practical - II(any SIX of the following)

1. Determination of radius of curvature of a given convex lens-Newton's rings.
2. Resolving power of grating.
3. Dispersive power of a prism.
4. Determination of wavelength of light using diffraction grating-minimum deviation method.
5. Determination of wavelength of light using diffraction grating-normal incidence method.
6. Determination of thickness of a thin wire by wedge method
7. Determination of refractive index of liquid-Boy's method.
8. Resolving power of a telescope.

Semester - III

Physics–III

Heat and Thermodynamics

➤ UNIT-I

- **Kinetic Theory of gases:**

(12 hrs)

Kinetic Theory of gases-Introduction, Experimental verification of Maxwell's law of distribution of molecular velocities, Mean free path, Degrees of freedom, Principle of equipartition of energy (Qualitative ideas only), Transport phenomena in ideal gases: viscosity, Thermal conductivity and diffusion of gases.

Assignment: (Analytical treatment) Maxwell's law of distribution of molecular velocities

➤ UNIT-II

- **Thermodynamics:**
(12hrs)

Introduction-

Isothermal and Adiabatic processes, Reversible and irreversible processes, Carnot's engine and its efficiency, Carnot's theorem, Thermodynamic scale of temperature and its identity with perfect gas scale, Second law of thermodynamics: Kelvin's and Clausius statements, Principle of refrigeration, Entropy, Physical significance, Change in entropy in reversible and irreversible processes; Entropy and disorder- Entropy of Universe; Temperature-Entropy (T-S) diagram and its uses ; change of entropy when ice changes into steam.

➤ **UNIT-III:**

• **Thermodynamic Potentials and Maxwell's equations:** (1

Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy and their significance, Derivation of Maxwell's thermodynamic relations from the thermodynamic potentials, Application to (i) Clausius-Clapeyron's equation (ii) Value of $C_P - C_V$ (iii) Value of C_P/C_V (iv) Joule-Kelvin coefficient for ideal and Vander Waals' gases

➤ **UNIT-IV:**

• **Low temperature Physics:**

(12 hrs) Methods for producing very low temperatures, Joule Kelvin effect, Proust's plug experiment, Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling, Liquefaction of air by Linde's method, Production of low temperatures by adiabatic demagnetization (qualitative), Practical applications of substances at low temperatures.

➤ **UNIT-V:**

• **Quantum theory of radiation:** (1

Derivation, Deduction of Wein's law and Rayleigh-Jean's law from Planck's law, Solar constant and its determination using Angstrom pyroheliometer, Estimation of surface temperature of Sun.

REFERENCE BOOKS:

- BSc Physics, Vol.2, Telugu Academy, Hyderabad
- Thermodynamics, R.C. Srivastava, S.K. Saha & Abhay K. Jain, Eastern Economy Edition.
- Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath & Co. Ltd., Meerut
- Fundamentals of Physics. Halliday/Resnick/Walker. C. Wiley India Edition 20

- Heat and Thermodynamics -N Brij Lal, P Subrahmanyam, S.Chand & Co., 2012
- Heat and Thermodynamics-MS Yadav, Anmol Publications Pvt.Ltd, 2000
- University Physics, H D Young, M W Zemansky, F W Sears, Narosa Publishers, New Delhi

Practical - III(any SIX of the following)

1. Specific heat of a liquid–Joule’s calorimeter–Barton’s radiation correction
2. Thermal conductivity of a bad conductor-Lee’s method
3. Thermal conductivity of rubber.
4. Thermo emf-thermocouple-Potentiometer
5. Study of variation of resistance with temperature-Thermistor.
6. Specific heat of a liquid by applying Newton’s law of cooling correction.
7. Measurement of Stefan’s constant-emissive method

Semester - IV

Physics-IV

Electricity, Magnetism and Electronics

➤ UNIT-I

1. Electrostatics: (6hrs)

Gauss's law-Statement and its proof, Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Deduction of Coulomb's law from Gauss law, Electrical potential – Equipotential surfaces, Potential due to (i) dipole (ii) uniformly charged sphere (iii) Hollow sphere.

2. Dielectrics:

Dielectrics-Polar and Non-polar dielectrics- Effect of electric field on dielectrics, Dielectric strength, Capacitance of a parallel plate condenser with dielectric slab between the plates, Electric displacement D , electric polarization P , Relation between D , E and P , Dielectric constant and electric susceptibility.

➤ UNIT-II

1. Magnetostatics:

Biot-Savart's law and its applications: (i) circular loop and (ii) solenoid, Divergence and curl of magnetic field, Ampere's Circuital Law and its application to Solenoid, Hall effect, determination of Hall coefficient and applications.

2. Electromagnetic Induction: (Assignment)

Faraday's laws of electromagnetic induction, Lenz's law, Self induction and Mutual induction, Self inductance of a long solenoid, Mutual inductance of two coils, Energy stored in magnetic field, Eddy currents and Electromagnetic damping

➤ UNIT-III

1. Alternating currents: (6 hrs)

Alternating current - Relation between current and voltage in LR and CR circuits, Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q-factor, Power in ac circuits, Power factor.

2. Electromagnetic waves-Maxwell's equations: (6 hrs)

➤ UNIT-IV

1. Basic Electronic devices: (12hrs)

PN junction diode, Zener diode and Light Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator- Transistors and its operation, CB, CE and CC configurations, Input and output characteristics of a transistor in CE mode, Relation between alpha, beta and gamma; Hybrid parameters, Determination of hybrid parameters from transistor characteristics; Transistor as an amplifier.

➤ **UNIT-V:**

1. Digital Electronics:

(12hrs)

Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, DeMorgan's laws- Statements and Proofs, Basic logic gates, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.

➤ **REFERENCE BOOKS**

- BSc Physics, Vol.3, Telugu Akademy, Hyderabad.
- Electricity and Magnetism, D.N. Vasudeva. S. Chand & Co.
- Electricity and Magnetism, B.D. Duggal and C.L. Chhabra. Shobanlal & Co.
- Electricity, Magnetism with Electronics, K.K. Tewari, R. Chand & Co.,
- Electricity and Magnetism, R. Murugesan, S. Chand & Co.
- Principles of Electronics, V.K. Mehta, S. Chand & Co.,
- Digital Principles and Applications, A.P. Malvino and D.P. Leach, McGrawHill Edition.

Practical – IV(any SIX of the following)

1. LCRcircuitseries/parallelresonance,Qfactor.
2. Determinationofac-frequency–Sonometer.
3. VerificationofKirchoff’slawsandMaximumPowerTransfertheorem.
4. TransistorCECharacteristics-Determinationofhybridparameters
5. LogicGates- OR,AND,NOTandNAND gates.VerificationofTruthTables.
6. VerificationofDeMorgan’sTheorems.
7. ConstructionofHalfadderandFulladders-Verificationoftruthtables
8. Fieldalongtheaxisofacircularcoilcarryingcurrent

Semester - IV

Physics -V

MODERN PHYSICS

➤ UNIT-I:

Atomic and Molecular Physics: **(12hrs)**

Vector atom model and Stern-

Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Spectral terms and spectral notations, Selection rules, Intensity rules, Fine structure of Sodium D-lines, Zeeman

effect, Experimental arrangement to study Zeeman effect; Raman effect, Characteristics of Raman effect,

Experimental arrangement to study Raman effect, Quantum theory of Raman effect, Applications of Raman effect.

➤ UNIT-II:

Matter waves & Uncertainty Principle:

(12 hrs)

Matter waves, de Broglie's hypothesis, Wave length of matter waves, Properties of

matter waves, Davisson and Germer's experiment, Phase and group velocities, Heisenberg's uncertainty principle for position and momentum & energy and time,

Illustration of uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit) and photons (Gamma ray microscope), Bohr's principle of complementarity.

➤ UNIT-III: Quantum (Wave) Mechanics: (12hrs)

Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations - Derivations, Physical interpretation of wave function, Eigen functions, Eigenvalues, Application of Schrodinger wave equation to (i)

one dimensional potential box of infinite height (Infinite Potential Well) and
(ii) one dimensional harmonic oscillator

➤ **UNIT-IV:**

Nuclear Physics:
(12hrs)

Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; Nuclear forces: Characteristics of nuclear forces- Yukawa's meson theory; Nuclear Models: Liquid drop model, The Shell model, Magic numbers; Nuclear Radiation detectors: G.M. Counter, Cloud chamber, Solid State detector; Elementary Particles: Elementary Particle and their classification

➤ **UNIT-V:**

1. Nanomaterials: (7hrs)

Nanomaterials – Introduction, Electron confinement, Size effect, Surface to volume ratio, Classification of nano materials – (0D, 1D, 2D); Quantum dots, Nano wires, Fullerene, CNT, Graphene (Mention of structures and properties), Distinct properties of nanomaterials (Mention - mechanical, optical, electrical, and magnetic properties); Mention of application of nanomaterials: (Fuel cells, Phosphors for HDTV, Next Generation Computer chips, elimination of pollutants, sensors)

2. Superconductivity: (Assignment) (5hrs)

Introduction to Superconductivity, Experimental results - critical temperature, critical magnetic field, Meissner effect, Isotope effect, Type I and Type II superconductors, BCS theory (elementary ideas only), Applications of superconductors

REFERENCE BOOKS

- BSc Physics, Vol.4, Telugu Akademy, Hyderabad
- Atomic Physics by J.B. Rajam; S.Chand & Co.,

- Modern Physics by R. Murugesan and Kiruthiga Siva Prasath. S. Chand & Co.
- Concepts of Modern Physics by Arthur Beiser. Tata McGraw-Hill Edition.
- Nuclear Physics, D.C.Tayal, Himalaya Publishing House.
- S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publ.Co.)

Practical – V(any SIX of the following)

1. e/m of an electron by Thomson method.
2. Determination of Planck's Constant (photocell).
3. Determination of the Planck's constant using LEDs of at least 4 different colours.
4. Energy gap of a semiconductor using junction diode.
5. Energy gap of a semiconductor using thermistor
6. Analysis of powder X-ray diffraction pattern to determine properties of crystals.
7. Energy gap of a semiconductor using thermistor

Semester – V

Course 6C: APPLICATIONS OF ELECTRICITY & ELECTRONICS

Unit-I INTRODUCTION TO PASSIVE ELEMENTS (10 hrs.)

Passive and Active elements - Examples, **Resistor**-

Types of Resistors, Color coding -

Applications of a Resistor as a heating element in heaters and as a fuse element.

Capacitor- Types of Capacitors, Color coding, Energy stored in a capacitor, Applications of Capacitor in power supplies, motors (Fans) etc.,

Inductor- Types of Inductors, EMF induced in an Inductor, Applications of Inductor, Application of choke in a fan and in a radio tuning circuit, Series resonance circuit as a Radio tuning circuit.

Unit-II Photo Electric Devices (10 hrs)

Structure and operation characteristics, spectral response and applications of LDR, Photovoltaic Cell, Photo Transistor

Unit-III Alternating Currents (10 hrs)

A.C Power source -

Generator, Construction and its working principle, Transformers -

Construction and its working principle, Types of Transformers - Step-down and Step-up Transformers, Relation between primary turns and secondary turns of the transformer with m , Use of a Transformer in a regulated Power supplies, Single phase motor - working principle, Applications of motors (like water pump, fan etc.).

Unit-IV Power Supplies (Skill Based) (10 hrs.)

Working of a DC regulated power supply, Construction of a 5 volts

regulated power supply, Design of a step-down (ex: 220-12V) and step-up (ex: 120-240V) transformers-Simple Design of FM Radio circuit using LCR series resonance (tuning) circuit, Checking the output voltage of a battery eliminator using a MultiMate.(Trouble shooting), Design of a simple 5 volts DC charger, Power supply for computers(SMPS)

Unit-V-Applications of Electromagnetic Induction (10hrs.)

DC motor–

Construction and operating principle, Calculation of power, voltage and current in a DC motor, Design of a simple Motor (for example Fan) with suitable turns of coil-DC generator-Construction, operating principle and EMF equation, Construction of a simple DC generator, Difference between DC and AC generators

I. References:

1. Grob's Basic Electronics by Mitchel Schultz, TMH or McGraw Hill
2. Electronic and Electrical Servicing by Ian Robertson Sinclair, John Dunton, Elsevier Publications
3. Troubleshooting Electronic Equipment by R.S. Khandapur, TMH
4. Web sources suggested by the teacher concerned and the college librarian including reading material.

Course 7C: ELECTRONIC INSTRUMENTATION
UNIT-I INTRODUCTION TO INSTRUMENTS (10hrs)

Types of electronic Instruments-

Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Basic ideas on Function generator

UNIT-II OSCILLOSCOPE (10hrs)

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (DC and AC), frequency, phase difference, Different types of oscilloscopes and their uses, Digital storage Oscilloscope

UNIT-III TRANSDUCERS & Bridges (10hrs)

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Fibre optic sensors.

Bridges: Introduction, Block diagram and Working of LCR bridge- Specifications.

UNIT-IV DISPLAY INSTRUMENTS (10hrs)

Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Principle and working of 2x16 display, Applications of LCD modules.

UNIT-V BIOMEDICAL INSTRUMENTS (10hrs)

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse oxymeter (x) Glucometer, Basic ideas of CT scan and MRI scan

III Reference Books:

1. Electronic Instrumentation by H.S. Kalsi, TMH Publishers
2. Electronic Instrument Handbook by Clyde F. Coombs, McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning
4. Biomedical Instrumentation and Measurements by Leslie Cromwell, Prentice Hall India.
 5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
 6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D. Halfrick, A.B., PHI Learning, New Delhi

Electronics

Syllabus during 2022-2023

Semester –I

Paper -I

Circuit Theory and Electronic Devices

UNIT I: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS:

Definition of current and voltage. The sine wave, general format of sine wave for voltage or current, phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C. Phase relation of R, L and C. Circuit analysis-loop current method, Nodal Voltage method.

UNIT II: (12hrs)

NETWORKS THEOREMS (D.C):

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems

UNIT III: (12hrs)

RC, RL AND RLC CIRCUITS:

Frequency response of RC and RL circuits, their action as low pass and high pass filters. Passive differentiating and integrating circuits. Series resonance and parallel resonance circuits, Q – Factor.

UNIT IV: (12hrs)

BJT, FET and UJT:

BJT: Construction, working, and characteristics of CE Configurations.

FET: Construction, working and characteristics of JFET.

MOSFET construction and working, Characteristics. Advantages of FET overBJT.

UNIT V: (12hrs)

POWER SUPPLIES & PHOTO ELECTRIC DEVICES

Rectifiers: Half wave, full wave and Bridge Rectifiers-Efficiency-ripple factor.

Filters- L-section & π -section filters (qualitativeonly). Three terminal fixed voltage

I.C. regulators (78XX&79XX). Light Emitting Diode and Photo diode.

Electronics lab-1(Circuit theory and Electronic devices) (ANY SIX)

1. Thevenin's Theorem-verification
2. Norton's Theorem-verification
3. Maximum Power Transfer Theorem-verification
4. LCR series resonance circuit.
5. LCR parallel resonance circuit
6. BJT input and output characteristics
7. FET Output and transfer characteristics
8. UJT VI characteristics
9. IC regulated power supply(IC-7805)

Semester –II
Paper -II
Digital Electronics

UNIT I : (12hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal- conversions Codes: BCD, Gray and Excess-3 codes Complements (1's and 2's), Addition - Subtraction using complement methods.

UNIT II: (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital IC logic gates, NAND & NOR as universal gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 2,3 variables).

UNIT III: (12hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders: Half & full adder. Subtractor: Half and full subtractors, Parallel binary adder, Multiplexers (4:1) and Demultiplexers (1:4), Encoder (8-line-to-3- line) and Decoder (3-line-to-8-line).

IC-LOGIC FAMILIES:TTL logic (NAND Gate), CMOS Logic (NORGate) operations with truth tables. Differences between CMOS and TTL logic families.

UNIT IV: (12hrs)

SEQUENTIAL DIGITAL CIRCUITS: Flip Flops: S-R FF, Clocked RS FF,D FF, Edge triggering J-K FF, Master-Slave JK FFs, Conversion of JK FF into D and T FFs. **Registers:** - SerialInSerialOut and ParallelIn and Parallel Out. **Counters:** Asynchronous Ripple counter (Mod-16), Mod-10. Synchronous counter- 4-bit parallel binary counter.

UNIT V: (12hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), Qualitative- PROM, EPROM, EEPROM, EAROM.

DIGITAL ELECTROINCS LAB (ANY SIX)

List of the Experiments:

1. Verification of IC-logic gates
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verification of Half adder and Full adder circuits using gates
5. Verification of Half subtractor and Full subtractor using gates.
6. Verification of truth tables- Multiplexer and Demultiplexer.
7. Verification of truth tables- Encoder and decoder.
8. Verification of truth tables- RS , JK, T-F/F using NAND gates
9. 4-bit binary parallel adder and subtractor using IC7483

Semester –III

Paper -III

Analog Circuits and Communication Electronics

UNIT I: (12hrs)

OPERATIONAL AMPLIFIERS: Definition of OP-amp, Characteristics of Op-Amp, Block diagram of op-amp, concept of virtual ground, op-amp parameters, inverting, non-inverting summing amplifiers analysis. Subtractor, voltage follower, integrator, differentiator, Logarithmic amplifier.

UNIT II: (12hrs)

OP-AMP CIRCUITS: voltage regulator, comparator, Schmitt trigger. Sine wave generator, Square wave generator, Active filters (Basics)-low pass, high pass filters, IC-555 –functional block diagram and mention its applications.

UNIT III: (12Hrs) AMPLITUDE MODULATION: Need for modulation, Expression for amplitude modulation-frequency spectrum, bandwidth of AM, power relations in the AM wave. Generation of AM- Transistor modulator. Detection of AM signals: Necessity for detection – Diode detector.

UNIT IV: (12hrs) FREQUENCY MODULATION: Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, Percent modulation. Mathematical representation of FM wave, frequency spectrum and bandwidth of FM waves, Generation of FM signals – Reactance modulator. Detection of FM waves – Ratio detector.

UNIT V: RADIO BROADCASTING AND RECEPTION: Spectrum of electromagnetic waves, Radio broadcasting and reception, AM Transmitter, AM receiver- block diagram approach, Super heterodyne receiver. FM receiver- Block diagram.

Analog Circuits and Communication Electronics Lab(ANY SIX)

1. Op-Amp as inverting and non-inverting
2. OpAmp Voltage follower.
3. Op-Amp as integrator and differentiator
4. Op-Amp as adder
5. Op-Amp as voltage to current converter
6. Op-Amp as square wave generator
7. Amplitude modulation and demodulation.
8. AM Transmitter and Receiver.
9. FM Transmitter and Receiver.

Semester –IV

Paper- IV

Microprocessor Systems

Unit-I:

8085 μ PARCHITECTURE: Introduction to Microprocessor, Intel 8085 μ PArchitecture, register organization, Pin configuration of 8085. Instruction Set, Addressing modes, Timing diagrams, interrupts of 8085.

UNIT II: (12Hrs)

Assembly Language Programming using 8085, Programmes for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array. Ascending and descending order of given array of numbers.

UNIT III: (12 Hrs)

8086 Microprocessor: Architecture, Pin description. Basic 8086 Configurations – Minimum mode and Maximum Mode, Instruction format, addressing modes. Interrupt Priority Management

UNIT IV: (12Hrs)

I/O Interfaces: Serial Communication, Parallel Communication, Keyboard and display, DMA controller (8257)

UNIT V: (12Hrs)

ARM PROCESSOR: Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Instruction set.

MICROPROCESSORS SYSTEMS LAB: Programs using Intel 8085 /8086.(ANY SIX)

1. Addition and Subtraction (8 bit and 16-bit)
2. Multiplication and Division (8-bit)
3. Largest number in an array.
4. Smallest number in an array.
5. Ascending Order
6. Descending Order
7. Program To Convert Two BCD Numbers into Hex
8. Program To Convert Hex Number Into BCD Number.
9. Program To Find The Square Root Of A Given Number.
10. Interfacing Experiments Using 8086 Microprocessor(Demo):
 1. Traffic Light Controller
 2. 7-Segment Display

Semester –IV

Paper- V

Microcontroller and Interfacing

UNIT I: (10Hrs)

Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit, Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

UNIT II: (10Hrs)

Microcontroller Architecture: Overview and block diagram of 8051, Architecture of 8051, Pin diagram of 8051. program counter and memory organization, Data types and directives, PSW register, Register banks and stack, Interrupts and timers.

UNIT III: (10Hrs)

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Timer/Counter Programming,

UNIT IV: (15Hrs)

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, largest, smallest.

UNIT V: (15Hrs)

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar).

Microcontroller systems(Lab)(any six)

1. Addition And Subtraction Of Two 8-Bit Numbers.
2. Multiplication And Division Of Two 8-Bit Numbers.
3. Largest number /smallest in an array.
4. Exchange Of Higher And Lower Nibbles In Accumulator.
5. Addition Of Two 8-Bit Numbers (Keil Software).
6. Addition Of Two 16-Bit Numbers (Keil Software)
7. Subtraction Of Two 8-Bit Numbers (Keil Software).
8. Subtraction Of Two 16-Bit Numbers (Keil Software).
9. Multiplication Of Two 8-Bit Numbers (Keil Software).

Semester – V

Course 6: Industrial Electronics

UNIT I: (20 hours)

Rectifiers and filters: Rectifiers– Half wave, full-wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter- Shunt capacitor filter- L section and section filters.

Voltage Regulators: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).

UNIT II: (10 hours)

Power Supplies: Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

UNIT III:

(10 hours)

Voltage Multipliers: Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

UNIT IV:

(10 hours)

Controlled rectifiers: SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

UNIT V:

(10 hours)

Heat effects: Resistance, inductance and dielectric heating. Principle of operations and its applications. Dielectric Properties: Introduction, effect of a dielectric on the behavior of a capacitor, dielectric losses, significance of the loss tangent.

Practical – VI (Any six of the following)

1. D.C Power supply and filters.
2. Transistor series regulator
3. Transistor as a shunt regulator
4. SCR VI characteristics.
5. Voltage regulator using IC-7805 and IC-7905.
6. Voltage doubler using diodes
7. Voltage Tripler using diodes

8. SCR Series inverter
9. SCR parallel inverter.

Semester – V

Course 7: ELECTRONIC INSTRUMENTATION

UNIT-I INTRODUCTION TO INSTRUMENTS (10 hrs)

Types of electronic Instruments- Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, $3\frac{1}{2}$ display and $4\frac{1}{2}$ display Digital multimeters, Basic ideas on Function generator

UNIT-II OSCILLOSCOPE (10 hrs)

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (DC and DC), frequency, phase difference, Different types of oscilloscopes and their uses, Digital storage Oscilloscope

UNIT-III TRANSDUCERS (10 hrs)

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fibre optic sensors

UNIT-IV DISPLAY INSTRUMENTS (10 hrs)

Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Principle and working of 2×16 display and 4×16 LCD modules, Applications of LCD modules.

UNIT-V BIOMEDICAL INSTRUMENTS

(10 hrs)

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse oxymeter (x) Glucometer, Basic ideas of CT scan and MRI scan

Practical – VII (Any six of the following)

1. Familiarisation of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii) diode test and (iii) transistor test
2. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
5. Measurement of body temperature using a digital thermometer and list out the error and corrections.
6. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
7. Observe and understand the operation of a Digital Pulse oxymeter and measure the pulse rate of different people and understand the working of the meter.
8. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
9. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.

Ch SD St Theresa's college for women(A), ELURU
Department of Chemistry
Affiliated to Adikavi Nannaya University



Course structure and syllabus
2022-2023

Ch SD St Theresa's college for women(A), ELURU

**Boards of studies meeting
Department of Chemistry**

Date : 16.06.2022

Time : 11 pm

Venue : Zoom platform

Members :

Dr Sr Mercy, Principal of the college

University Nominee:

Dr B. Jagan Mohan Reddy, Department of Chemistry, AKNU, RJD

Subject experts:

Dr K. A. Emmanuel, Associate Professor in Chemistry, Dept of Chemistry, YVNR Govt Degree college, KAIKALURU.

Industrialist :

Mr. J.Satya Narayana Raju, Industrialist, Satrampadu, ELURU

Alumni members:

1. P. Vani III MPC 181168
2. B. Sowjanya II MPC 191105

Faculty – Internal Members:

1. Dr CA Jyothirmayee
2. Dr M Rama
3. Dr V Naga Lakshmi
4. Dr N. Gayathri Devi
5. Dr K Swarna Latha
6. Mr G. Srinivasa Rao
7. Mrs. KJ Subhashini
8. Ms. N.Madhavi
9. Mrs K. Vara Lakshmi

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A), ELURU

DEPARTMENT OF CHEMISTRY

PAPER TITLES

Year	Semester	Paper	Title	
I	I	I	Inorganic and Physical Chemistry	
			Practical – I Analysis of SALT MIXTURE	
	II	II	Organic and General Chemistry	
			Practical – II Volumetric Analysis	
II	III	III	Organic Chemistry and Spectroscopy	
			Practical – III Organic preparations and IR Spectral Analysis	
	IV	IV	Inorganic, Organic and Physical Chemistry	
			Practical – IV Organic Qualitative analysis	
		V	V	Inorganic and Physical Chemistry
				Practical – V Conductometric and Potentiometric Titrimetry
III	V	VI B VII B	Analytical Methods in Chemistry-1 Analytical Methods in Chemistry-2	

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
I BSC -I SEMESTER - CHEMISTRY SYLLABUS 2022-2023
PAPER - I

TITLE: INORGANIC & PHYSICAL CHEMISTRY 60hrs (4hr/w)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Understand the basic concepts of p-block elements
- 2) Explain the difference between solid, liquid and gases in terms of intermolecular interactions.
- 3) Apply the concepts of gas equations, pH and electrolytes while studying other chemistry courses.

INORGANIC CHEMISTRY 24 h

UNIT-I

Chemistry of p-block elements 8h

Group 13: Preparation & structure of Diborane, Borazine

Group 14: Preparation, classification and uses of silicones

Group 15: Preparation & structures of Phosphonitrilic halides $\{(PNCl_2)_n\}$ where $n=3, 4$

Group 16: Oxides and Oxoacids of Sulphur (structures only)

Group 17: Pseudo halogens, Structures of Interhalogen compounds.

UNIT-II

Chemistry of d-block elements: 6h

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states.

Chemistry of f-block elements: 6h

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

Theories of bonding In metals: 4h

Valence bond theory and Free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, Band theory- formation of bands, explanation of conductors, semiconductors and insulators.

PHYSICAL CHEMISTRY 36h

UNIT-III

Solid state 10h

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law.

Powder method. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-IV

Gaseous state 6h

Van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and Vander Waal's constants. Law of corresponding states. Joule- Thomson effect. Inversion temperature.

Liquid state 4h

Liquid crystals, mesomorphic state. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices.

UNIT-V

Solutions, Ionic equilibrium & dilute solutions

Solutions 6h

Azeotropes-HCl-H₂O system and ethanol-water system. Partially miscible liquids-phenol-water system. Critical solution temperature (CST), Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

Ionic equilibrium 3h

Ionic product, common ion effect, solubility and solubility product. Calculations based on solubility product.

Dilute solutions 7h

Colligative properties- RLVP, Osmotic pressure, Elevation in boiling point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile solute using osmotic pressure, Elevation in boiling point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Work sheets and Quizzes Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking; skills and personality Semester- end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books

- 1) Principles of physical chemistry by Prutton and Marron
- 2) Solid State Chemistry and its applications by Anthony R. West
- 3) Text book of physical chemistry by K L Kapoor
- 4) Text book of physical chemistry by S Glasstone
- 5) Advanced physical chemistry by Bahland Tuli
- 6) Inorganic Chemistry by J.E. Huheey
- 7) Basic Inorganic Chemistry by Cotton and Wilkinson

- 8) A textbook of qualitative inorganic analysis by A.I. Vogel
- 9) Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry Ed., Oxford University Press
10th Ed (2014).
- 10) Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- 11) Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- 12) Barrow, G. M. Physical Chemistry

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU

I Bsc- I Semester -Chemistry Syllabus 2022-2023

Laboratory course-I 30hrs (2 h /w)

Practical-I Analysis of MIXTURE

(At the end of Semester-I)

Qualitative inorganic analysis

(Minimum of Six mixtures should be analysed)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Understand the basic concepts of qualitative analysis of inorganic mixture
- 2) Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- 3) Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis

Analysis of Salt Mixture

Analysis of mixture salt containing two anions and two cations (From two different groups) from the following:

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate, Phosphate.

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Potassium and Ammonium.

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU

I BSc -II Semester- Chemistry Syllabus 2022-2023

PAPER - II

TITLE: ORGANIC & GENERAL CHEMISTRY 60hrs (4hr/W)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.
- 2) Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
- 3) Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
- 4) Correlate and describe the stereochemical properties of organic compounds and reactions.

ORGANIC CHEMISTRY 36h

UNIT-I

Recapitulation of Basics of Organic Chemistry

Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)

12h

General methods of preparation of alkanes- Wurtz and Wurtz Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical substitutions; Halogenation, concept of relative reactivity v/s selectivity. Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane). General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram, Conformations of monosubstituted cyclohexane.

UNIT-II

Carbon-Carbon pi Bonds (Alkenes and Alkynes)

12h

General methods of preparation, physical and chemical properties. Mechanism of E_1 , E_2 , E_{1cB} reactions, Saytzeff and Hoffmann eliminations, Electrophilic Additions, mechanism (Markownikoff / Antimarkownikoff addition with suitable examples, *syn* and *anti*-addition; addition of H_2 , X_2 , HX . Oxymercuration, demercuration, hydroboration-oxidation, ozonolysis, hydroxylation, Diels Alder reaction, 1,2- and 1,4-addition reactions in conjugated dienes. Reactions of alkynes; acidity, electrophilic and nucleophilic additions, hydration to form carbonyl compounds, Alkylation of terminal alkynes.

UNIT-III

Benzene and its reactivity 12h

Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation) Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel-Craft's alkylation and acylation. Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups

with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)

GENERAL CHEMISTRY 24 h

UNIT-IV

Surface chemistry and chemical bonding

Surface chemistry 6h

Colloids- Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number.

Adsorption-Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption.

Chemical Bonding 6h

Valence bond theory, hybridization, VB theory as applied to ClF_3 , $\text{Ni}(\text{CO})_4$, Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2 , O_2 , CO and NO).

HSAB 2h

Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

UNIT-V

Stereochemistry of carbon compounds 10h

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. Chiral molecules- definition and criteria (Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. D,L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Worksheets and Quizzes. Presentations, Projects and Assignments and Group Discussions :Enhances critical thinking skills and personality

Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books Theory:

- 1) Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 2) Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

- 3) Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 4) Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994. Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.
- 5) Practical:
- 6) Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- 7) Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
- 8) Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)

Additional Resources:

- 1) Solomons, T. W. G.; Fryhle, C. B. & Snyder, S. A. Organic Chemistry, 12th Edition, Wiley. Bruice, P. Y. Organic Chemistry, Eighth Edition, Pearson.
- 2) Clayden, J.; Greeves, N. & Warren, S. Organic Chemistry, Oxford.
- 3) Nasipuri, D. Stereochemistry of Organic Compounds: Principles and Applications, Third Edition, New Age International.
- 4) Gunstone, F. D. Guidebook to Stereochemistry, Prentice Hall Press, 1975.

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU

II SEMESTER

LABORATORY COURSE-II

30hrs (2 h /w)

Practical-II Volumetric Analysis

(At the end of Semester-II)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- 2) Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria
- 3) Learn and identify the concepts of a standard solutions, primary And secondary standards
- 4) Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Volumetric analysis

- 1) Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
- 2) Determination of Fe (II) using KMnO_4 with oxalic acid as primary standard.
- 3) Determination of Cu (II) using $\text{Na}_2\text{S}_2\text{O}_3$ with $\text{K}_2\text{Cr}_2\text{O}_7$ as primary standard.
- 4) Estimation of water of crystallization in Mohr's salt by titrating with KMnO_4

**CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
II BSC -III SEMESTER -CHEMISTRY SYLLABUS 2022-2023**

PAPER III

TITLE:ORGANIC CHEMISTRY & SPECTROSCOPY 60hrs (4h/w)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Understand preparation, properties and reactions of haloalkanes, haloarenes and oxygen containing functional groups.
- 2) Use the synthetic chemistry learnt in this course to do functional group transformations.
- 3) To propose plausible mechanisms for any relevant reaction

ORGANIC CHEMISTRY 34h

UNIT – I

Chemistry of Halogenated Hydrocarbons:

6h

Alkyl halides: Methods of preparation and properties, nucleophilic substitution reactions— SN_1 , SN_2 and SN_i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination, Williamson's synthesis. Aryl halides: Preparation (including preparation from diazonium salts) and properties, nucleophilic aromatic substitution; SN_{Ar} , Benzyne mechanism. Relative reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

Alcohols & Phenols; 6h

Alcohols: preparation, properties and relative reactivity of 1° , 2° , 3° alcohols, Bouvaelt Blanc Reduction; Oxidation of diols by periodic acid and lead tetra acetate, Pinacol-Pinacolone rearrangement;

Phenols: Preparation and properties; Acidity and factors effecting it, Ring substitution reactions, Reimer-Tiemann and Kolbe's-Schmidt Reactions, Fries and Claisen rearrangements with mechanism;

UNIT-II

Carbonyl Compounds:

10h

Structure, reactivity, preparation and properties; Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives. Mechanisms of Aldol and Benzoin condensation, Claisen-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann haloform reaction and Baeyer Villiger oxidation, α -substitution reactions, oxidations and reductions (Clemmensen, Wolf-Kishner, with $LiAlH_4$ & $NaBH_4$). Addition reactions of α,β -unsaturated carbonyl compounds :Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate.

UNIT-III

Carboxylic acids and their Derivatives :12h

General methods of preparation, physical properties and reactions of monocarboxylic acids, effect of substituents on acidic strength. Typical reactions of dicarboxylic acids, hydroxy acids and unsaturated acids. Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group-Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Reformatsky reactions and Curtius rearrangement. Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt- Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.

SPECTROSCOPY; 26 h

UNIT-IV

Molecular Spectroscopy:

18h

Interaction of electromagnetic radiation with molecules and various types of spectra;

Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, Harmonic and anharmonic oscillator, Morse potential curve, vibrational degrees of freedom for polyatomic molecules, modes of vibration. Selection rules for vibrational transitions, Fundamental frequencies, overtones and hot bands.

Electronic spectroscopy: Energy levels of molecular orbitals (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore. bathochromic and hypso chromic shifts. Beer-Lambert's law and its limitations.

Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

UNIT-V

8h

Application of Spectroscopy to Simple Organic Molecules

Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating λ_{\max} of conjugated dienes and α, β - unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions).

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Worksheets and Quizzes Presentations, Projects and Assignments and Group Discussions : Enhances

critical thinking, skills and personality

Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books

- 1) A Text Book of Organic Chemistry by BahlandArunbahl
- 2) A Text Book of Organic chemistry by I L FinarVoll
- 3) Organic chemistry byBruice
- 4) Organic chemistry byClayden
- 5) Spectroscopy by WilliamKemp
- 6) Spectroscopy byPavia
- 7) Organic Spectroscopy by J. R.Dyer
- 8) Elementary organic spectroscopy by Y.R.Sharma
- 9) Spectroscopy byP.S.Kalsi
- 10) Spectrometric Identification of Organic Compounds by Robert M Silverstein, Francis X Webster
- 11) Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education(2009)
- 12) Furniss, B.S., Hannaford, A.J., Smith, P.W.G. &Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson(2012)
- 13) Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
III SEMESTER- LABORATORY COURSE – III 30hrs (2 h /w)
Practical -III Organic preparations and IR Spectral Analysis
(At the end of Semester- III)

Course outcomes:

- 1) On the completion of the course, the student will be able to do the following:
- 2) How to use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- 3) How to calculate limiting reagent, theoretical yield, and percent yield
- 4) How to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately
- 5) How to dispose of chemicals in a safe and responsible manner
- 6) How to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration.
- 7) How to create and carry out work up and separation procedures
- 8) How to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner

Organic preparations:

- 1) Acetylation of one of the following compounds:
amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and phenols (β -naphthol, vanillin, salicylic acid) by any one method:
 - a) Using conventional method.
 - b) Using green approach
- 2) Benzoylation of one of the following amines
(aniline, o-, m-, p-toluidines and o-, m-, p-anisidine)
- 3) Nitration of any one of the following:
 - a. Acetanilide/nitrobenzene by conventional method
- 4) Salicylic acid by green approach (using ceric ammonium nitrate).
- 5) IR Spectral Analysis

IR Spectral Analysis of the following functional groups with examples

- i. Hydroxyl groups
- ii. Carbonyl groups
- iii. Aminogroups
- iv. Aromatic groups

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
II BSC - IV SEMESTER - CHEMISTRY SYLLABUS 2022-2023
PAPER - IV

TITLE: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY 60hrs (4 h / w)

Course outcomes:

At the end of the course, the student will be able to;

- 1) To learn about the laws of absorption of light energy by molecules and the subsequent photochemical reactions.
- 2) To understand the concept of quantum efficiency and mechanisms of photochemical reactions.

UNIT -I

Organometallic Compounds:

8h

Definition and classification of organometallic Compounds on the basis of bond type, Concept of hapticity of organic ligands .Metal carbonyls:18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series.General methods of preparation of mono and binuclear carbonyls of 3d series. P-acceptor behaviour of carbon monoxide. Synergic effects (VB approach) - (MO diagram of CO can be referred to for synergic effect to IR frequencies).

UNIT – II

Carbohydrates:

8h

Occurrence, classification and their biological importance, Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation;Disaccharides– Elementary treatment of maltose, lactose and sucrose. Polysaccharides–Elementary treatment of starch.

UNIT- III

Amino acids and proteins:

6h

Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Gabriel Phthalimide synthesis c) Strecker's synthesis.

Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

Heterocyclic Compounds:

7h

Introduction and definition: Simple five membered ring compounds with one hetero atom Ex.

Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, - dicarbonyl compounds, Paul-Knorr synthesis.

Properties: Acidic character of pyrrole - electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.

Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.

UNIT- IV

Nitrogen Containing Functional Groups

Preparation, properties and important reactions of nitro compounds, amines and diazonium salts.

Nitrohydrocarbons:

3h

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to acid and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Micheal addition and reduction.

Amines:

11h

Introduction, classification ,chirality in amines (pyramidal inversion), importance and general methods of preparation. Properties : Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary, Secondary and tertiary amines using Hinsberg's method and nitrous acid. Discussion of the following reactions with emphasis on the mechanistic pathway-Gabriel Phthalimide synthesis, Hoffmann-Bromamide reaction, Carbylamine reaction, Mannich reaction, Hoffmann's exhaustive methylation, Hofmann-elimination reaction and Cope elimination. Diazonium Salts: Preparation and synthetic applications of diazonium salts including preparation of arenes, halo arenes, phenols ,cyano and nitro compounds. Coupling reactions of diazonium salts (preparation of azo dyes).

UNIT- V

Photochemistry:

5h

Difference between thermal and photochemical processes, Laws of photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield-Photochemical reaction mechanism- hydrogen- chlorine and hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions- energy transfer processes (simple example).

Thermodynamics:

12 h

The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirchoff s equation, Second law of thermodynamics, Different Statements of the law, Carnot cycle and its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and

equilibrium processes. Third law of thermodynamics, Nernst heat theorem, Spontaneous and non-spontaneous processes, Helmholtz and Gibbs energies-Criteria for spontaneity.

Co-curricular activities and Assessment Methods:

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Work sheets and Quizzes Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking, skills and personality. Semester-end Examination: critical indicator of student's learning and teaching methods Adopted by teachers throughout the semester.

List of Reference Books

- 1) Concise coordination chemistry by Gopalan and Ramalingam
- 2) Coordination Chemistry by Basal and Johnson
- 3) Organic Chemistry by G. Marel and Purdue Univ
- 4) Text book of physical chemistry by S Glasstone
- 5) Concise Inorganic Chemistry by J.D. Lee
- 6) Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
- 7) A Text Book of Organic Chemistry by Bah and Arunbahl
- 8) A Text Book of Organic chemistry by I L Finar Vol II
- 9) A Text Book of Organic chemistry by I L Finar Vol III
- 10) Advanced physical chemistry by Gurudeep Raj

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
IV SEMESTER - LABORATORY COURSE-IV 30hrs (2 h /w)

Practical -IV Organic Qualitative analysis
(At the end of Semester- IV)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- 2) Determine the Melting and boiling points of the Organic compounds.
- 3) Understand the application of concepts of different organic reactions studied in theory part of organic chemistry

Organic Qualitative analysis

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives.

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic primary amines, amides and simple sugars

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
II BSC – IV SEMESTER-CHEMISTRY SYLLABUS 2022-2023
PAPER - V

TITLE: INORGANIC & PHYSICAL CHEMISTRY 60 hrs (4 h /w)

Course outcomes:

At the end of the course, the student will be able to;

- 1) Understand concepts Of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation values
- 2) Application of quantization to spectroscopy.
- 3) Various types of spectra and their use in structure determination.

INORGANIC CHEMISTRY **26 h**

UNIT –I

Coordination Chemistry **12 h**

IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, Factors affecting the magnitude of crystal field splitting energy, Spectro chemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Tetragonal distortion of octahedral geometry, Jahn-Teller distortion, square planar coordination.

UNIT –II

Inorganic Reaction Mechanism:4h

Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transition state, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions. SN^1 and SN^2 , Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and its applications.

Stability of metal complexes: **2h**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

Bio- inorganic Chemistry: **8h**

Metal ions present in biological systems, classification of elements according to their action in biological system. Geochemical effect on the distribution of metals, Sodium/K- pump, carbonic anhydrase and carboxy peptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), Reasons for toxicity, Use of chelating agents in Medicine, Cis platin as an anti-cancer drug. Iron and its application in bio-systems,

Haemoglobin, Myoglobin. Storage and transfer of iron.

PHYSICAL CHEMISTRY 34 h

UNIT-III

1 .Phase rule:

6h

Concept of phase, components, degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.

UNIT-IV

Electrochemistry:

14h

Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel - Onsager's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conductometric titrations. Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal-metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations. Fuel cells- Basic concepts, examples and applications

UNIT-V

Chemical Kinetics:

14h

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). Enzyme catalysis- Specificity, factors affecting enzyme catalysis, Inhibitors and Lock & key model. Michaelis-Menten equation- derivation, significance of Michaelis-Menten constant.

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Work sheets and Quizzes Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking, skills and personality. Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books

- 1) Text book of physical chemistry by S Glasstone

- 2) Concise Inorganic Chemistry by J.D. Lee
- 3) Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
- 4) Advanced physical chemistry by Gurudeep Raj
- 5) Principles of physical chemistry by Prutton and Marron
- 6) Advanced physical chemistry by Bahlan and Tuli
- 7) Inorganic Chemistry by J.E. Huheey
- 8) Basic Inorganic Chemistry by Cotton and Wilkinson
- 9) A textbook of qualitative inorganic analysis by A.I. Vogel
- 10) Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry Ed., Oxford University Press
10th Ed (2014).
- 11) Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- 12) Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- 13) Barrow, G. M. Physical Chemistry

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN(A), ELURU
SEMESTER - IV

Paper- V Laboratory Course 30hrs (2 h /w)

Practical-Course -V Conductometric and Potentiometric Titrimetry

Course outcomes:

At the end of the course, the student will be able to;

- 1) Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- 2) Apply concepts of electrochemistry in experiments
- 3) Be familiar with electro analytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte

Conductometric and Potentiometric Titrimetry

- 1) Conductometric titration- Determination of concentration of HCl solution using standard NaOH solution.
- 2) Conductometric titration- Determination of concentration of CH₃COOH Solution using standard NaOH solution.
- 3) Conductometric titration- Determination of concentration of CH₃COOH and HCl in a mixture using standard NaOH solution.
- 4) Potentiometric titration- Determination of Fe (II) using standard K₂Cr₂O₇ solution.
- 5) Determination of rate constant for acid catalyzed ester hydrolysis.

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A), ELURU
III BSC – V SEMESTER-CHEMISTRY SYLLABUS 2022-2023
PAPER – VI B

TITLE: Analytical Methods in Chemistry-1
(Skill Enhancement Course (Elective), Credits: 05)

Max Marks: 50

60 hrs (4 h /w)

Learning Outcomes:

Students after successful completion of the course will be able to:

- 1) Identify the importance of solvent extraction and ion exchange method.
- 2) Acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis.
- 3) Demonstrate the usage of common laboratory apparatus used in quantitative analysis.
- 4) Understand the theories of different types of titrations.
- 5) Gain knowledge on different types of errors and their minimization methods.

Syllabus:

(Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)

Unit-1: Quantitative analysis-1 8 hours

A brief introduction to analytical methods in chemistry

1.Principles of volumetric analysis, concentration terms- Molarity, Molality, Normality, v/v, w/v, ppm and ppb, preparing solutions- Standard solution, primary standards and secondary standards.

2. Description and use of common laboratory apparatus- volumetric flask, burette, pipette, beakers, measuring cylinders.

Unit-2: Quantitative analysis-2 12hours

Principles of volumetric analysis: Theories of acid-base (including study of acid-base titration curves), redox, complex metric, iodometric and precipitation titrations-choice of indicators for the saturations.

Principles of gravimetric analysis: precipitation, coagulation, peptization, co precipitation, post precipitation, digestion, filtration, and washing of precipitate, drying and ignition.

Unit-3: Treatment of analytical data 8hours

Types of errors- Relative and absolute, significant figures and its importance, accuracy - methods of expressing accuracy, errors- Determinate and indeterminate and minimization of errors, precision-methods of expressing precision, standard deviation and confidence interval.

Unit-4: Separation techniques 12 hours

Solvent Extraction: Introduction, principle, techniques, factors affecting solvent extraction, Batch extraction, continuous extraction and counter current extraction. Synergism. Application-Determination of Iron (III).

Ion Exchange method: Introduction, action of ion exchange resins, applications.

UNIT-5: Analysis of water 10hours

Determination of dissolved solids, total hardness of water, turbidity, alkalinity, Dissolved oxygen, COD, determination of chloride using Mohr's method.

References

- 1) Fundamentals of Analytical Chemistry by F.James Holler, Stanley R Crouch, Donald M. West and Douglas A.Skoog, Ninth edition, Cengage.
- 2) Analytical Chemistry by Gary D.Christian, Purnendu K.Dasgupta and Kevin A.Schug, Seventh edition, Wiley.
- 3) Quantitative analysis by R.A.Day Jr. And A.L.Underwood, Sixth edition, Pearson.
- 4) Text book of Vogel's Quantitative Chemical Analysis, Sixth edition, Pearson.
- 5) Text book of Environmental Chemistry and Pollution Control by S.S.Dara and D.D.Mishra, Revised edition, S Chand & Co Ltd.

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A), ELURU
III BSC – V SEMESTER-CHEMISTRY SYLLABUS 2022-2023
Analytical Methods in Chemistry-1-Practical Syllabus

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- 1) Estimate Iron(II) using standard Potassium dichromate solution
- 2) Learn the procedure for the estimation of total hardness of water
- 3) Demonstrate the determination of chloride using Mohr's method
- 4) Acquire skills in the operation and calibration of pH meter
- 5) Perform the strong acid vs strong base titration using pH meter

Practical (Laboratory) Syllabus: (30hrs) (Max.50 Marks)

- 1) Estimation of Iron(II) using standard Potassium dichromate solution (using DPA indicator)
- 2) Estimation of total hardness of water using EDTA
- 3) Determination of chloride ion by Mohr's method
- 4) Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.
- 5) Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammonium hydroxide.
- 6) pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.
- 7) Determination of dissociation constant of a weak acid.

Lab References:

Text book of Vogel's Quantitative Chemical Analysis, Sixth edition, Pearson.

Co-Curricular Activities:

Mandatory: (Lab/field training of students by teacher: (lab:10+field:05):

For Teacher: Training of students by the teacher in laboratory and field for not less than 15 hours on the field techniques/skills of calibration of pH meter, Strong acid vs strong base titration using pHmeter, determination of chloride ion, estimation of water quality parameters and estimation of Iron(II).

For Student: Student shall visit a related industry/chemistry laboratory in universities/research organizations/private sector facility and observe various methods used for the analysis of water. Write their observations and submit a hand written fieldwork/project work report not exceeding 10 pages in the given format to the teacher.

Max marks for Fieldwork/project work Report: 05.

Suggested Format for Fieldwork/project work: *Title page, student details, index page, details of place visited, observations, findings, and acknowledgements.*

Unit tests (IE).

Suggested Co-Curricular Activities

- 1) Training of students' by related industrial experts.

- 2) Assignments, Seminars and Quiz (on related topics).
- 3) Visits to facilities, firms, research organizations etc.
- 4) Invited lectures and presentations on related topics by field/industrial experts.

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III BSC – V SEMESTER-CHEMISTRY SYLLABUS 2022-2023

PAPER – VII B

TITLE: Analytical Methods in Chemistry-2

(Skill Enhancement Course (Elective), Credits: 05) Max Marks: 50

Learning Outcomes:

Students after successful completion of the course will be able to:

- 1) Identify the importance of chromatography in the separation and identification of compounds in a mixture
- 2) Acquire a critical knowledge on various chromatographic techniques.
- 3) Demonstrate skills related to analysis of water using different techniques.
- 4) Understand the principles of spectro chemistry in the determination of metal ions.
- 5) Comprehend the applications of atomic spectroscopy.

Syllabus : (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.*)

Unit-1: Chromatography-Introduction and classification 10 hours

Principle, Classification of chromatographic methods, Nature of adsorbents, eluents, R_f values, factors affecting R_f values.

UNIT-2: TLC and paper chromatography 12 hours

Thin layer chromatography: Principle, Experimental procedure, preparation of plates, adsorbents and solvents, development of chromatogram, detection of spots, applications and advantages.

Paper Chromatography: Principle, Experimental procedure, choice of paper and solvents, various modes of development- ascending, descending, radial and two dimensional, applications.

UNIT-3: Column chromatography 12 hours

Column chromatography: Principle, classification, Experimental procedure, stationary and mobile phases, development of the Chromatogram, applications.

HPLC: Basic principles, instrumentation –block diagram and applications.

UNIT-4: Spectrophotometry 8hours

Principle, Instrumentation: Single beam and double beam spectrometer, Beer- Lambert's law- Derivation and deviations from Beer-Lambert's law, applications of Beer- Lambert's law- Quantitative determination of Fe^{+2} , Mn^{+2} and Pb^{+2} .

UNIT-5: Atomic spectroscopy 8hours

Types, atomizer, atomic absorption and emission and applications.

References

- 1) Fundamental so Analytical Chemistry by F.James Holler, Stanley R Crouch, Donald M.Westand Douglas A.Skoog, Ninth edition, Cengage.
- 2) Analytical Chemistry by Gary D.Christian, Purnendu K.Dasgupta and Kevin A.Schug, Seventh edition, Wiley.
- 3) Quantitative analysis by R.A.Day Jr. and A.L.Underwood, Sixth edition, Pearson.
- 4) Text book of Vogel's Quantitative Chemical Analysis, Sixth edition/ Pearson.

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III BSC – V SEMESTER-CHEMISTRY SYLLABUS 2022-2023
TITLE: Analytical Methods in Chemistry-2
Practical Syllabus

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- 1) Perform the separation of a given dye mixture using TLC
- 2) Learn the preparation of TLC plates
- 3) Demonstrate the separation of mixture of amino acids using paper chromatography
- 4) Acquire skills in using column chromatography for the separation of dye mixture

Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

- 1) Separation of a given dye mixture (methyl orange and methylene blue) using TLC (using alumina as adsorbent).
- 2) Separation of mixture of methyl orange and methylene blue by column chromatography.
- 3) Separation of given mixture of amino acids (glycine and phenyl alanine) using ascending paper chromatography.
- 4) Separation of food dyes using Column Chromatography
- 5) Separation of triglycerides using TLC
- 6) Verification of Beer Lambert's law. (Using potassium permanganate solution) using colorimeter /spectrophotometer.

Lab References:

- 1) Text book of Vogel's Quantitative Chemical Analysis, Sixth edition, Pearson.
- 2) Vogel A. I. Practical Organic Chemistry, Longman Group Ltd.
- 3) Bansal R.K. Laboratory Manual of Organic Chemistry, Wiley- Eastern.
- 4) Ahluwalia V. K. and Aggarwal R. Comprehensive Practical Organic Chemistry, University press.
- 5) Mann F.Gand Saunders B.C, Practical Organic Chemistry, Pearson Education.

Co-Curricular Activities:

Mandatory: *(Lab/field training of students by teacher (lab:10+field:05):*

For Teacher: Training of students by the teacher in laboratory and field for not less than 15 hours on the field techniques/skills of determination of hardness of water, using the calorimeter and or Spectrophotometer, preparation of TLC plate, identification of spots in TLC and Paper chromatographic techniques, loading of column, selection of solvent system, separation of amino acids and dyes mixture using chromatographic techniques.

For Student: Student shall visit a related industry/chemistry laboratory in universities/research organizations/private sector facility and observe the chromatographic

techniques used for the separation of compounds. Write their observations and submit a hand written fieldwork/project work report not exceeding 10 pages in the given format to the teacher.

Max marks for Fieldwork/project work Report: 05.

4. Suggested Format for Fieldwork/project work: *Title page, student details, index page, details of place visited, observations, findings, and acknowledgements.*

Suggested Co-Curricular Activities

- 1) Training of students by related industrial experts.
- 2) Assignments, Seminars and Quiz (on related topics).
- 3) Visits to facilities, firms, research organizations etc.
- 4) Invited lectures and presentations on related topics by field/industrial experts

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A), ELURU
DEPARTMENT OF BOTANY
SYLLABUS: 2022-23
PAPER TITLES

	Semester	Paper	Title of the Paper
I Year	I	Paper I	Fundamentals of Microbes and Non-vascular Plants
		Skill Development course	Plant Nursery
	II	Paper II	Basics of Vascular plants and Phyto-geography
		Skill Development course	Fruits and Vegetable Preservation
II Year	III	Paper III	Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity
		Life skills - 2	Environmental Education
	IV	Paper IV	Plant Physiology and Metabolism
		Paper V	Cell biology, Genetics and Plant Breeding
III Year	V	Paper VI	Vegetable Crops – Cultivation Practices
		Paper VII	Vegetable Crops – Post Harvest Practices
	VI	Intern ship	
		Certificate course	Herbal Medicine

CH.S.D.ST.THERESA'S DEGREE COLLEGE FOR WOMEN (A), ELURU

I BSC I SEMESTER PAPER I BOTANY SYLLABUS 2022-2023

Title: Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

UNIT-I: Origin of life and Viruses

1. Origin of life concept of primary A-biogenesis; Miller and Urey experiment. Five kingdom classification of R.H. Whittaker.
2. Discovery of microorganisms, Pasteur experiments, germ theory of diseases.
3. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplication of TMV; A brief account of Prions and Viroids.
4. A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control.
5. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.

UNIT-II: Special groups of Bacteria and Eubacteria

6. Brief account of Cyanobacteria.
7. Cell structure and nutrition of Eubacteria.
8. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction).
9. Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine).
10. A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.

UNIT-III: Fungi & Lichens

11. General characteristics of fungi.
12. Structure, reproduction and life history of (a) Rhizopus (Zygomycota) and (b) Puccinia (Basidiomycota).
13. Economic uses of fungi in food industry, pharmacy and agriculture.
14. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice.
15. Lichens- structure and reproduction; ecological and economic importance.
16. Mushroom cultivation technique.

UNIT-IV: Algae

17. General characteristics of Algae (pigments, flagella and reserve food material);
18. Thallus organization in Algae.
19. Occurrence, structure, reproduction and life cycle of (a) Spirogyra (Chlorophyceae) and (b) Polysiphonia (Rhodophyceae).
20. Economic importance of Algae.

UNIT-V: Bryophytes

21. General characteristics of Bryophytes.
22. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) Marchantia (Hepaticopsida) and (b) Funaria (Bryopsida).
23. General account on evolution of sporophytes in Bryophyta.

Practical

Laboratory Exercises:

1. Knowledge of Microbiology laboratory practices and safety rules.
2. Knowledge of different equipment for Microbiology laboratory (Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, Laminar air flow chamber and Incubator) and their working principles.
3. Demonstration of Gram's staining technique for Bacteria.
4. Study of Viruses (Corona, Gemini and TMV) using electron micrographs/ models.
5. Study of Archaeobacteria and Actinomycetes using permanent slides/ electron micrographs/diagrams.
6. Study of Anabaena and Oscillatoria using permanent/temporary slides.
7. Study of different bacteria (Cocci, Bacillus, Vibrio and Spirillum) using permanent or temporary slides/ electron micrographs/ diagrams.
8. Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:
 - a. Fungi: Rhizopus, Penicillium and Puccinia.
 - b. Lichens: Crustose, foliose and fruiticose
 - c. Algae: Volvox, Spirogyra, Ectocarpus, Polysiphonia
 - d. Bryophyta : Marchantia and Funaria
9. Study of specimens of Tobacco mosaic disease, Citrus canker and Blast of Rice.

I BSC II SEMESTER – PAPER II BOTANY SYLLABUS 2022-2023

Title: Basics of Vascular plants and Phyto-geography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phyto-geography)

UNIT-I: Pteridophytes

1. General characteristics of Pteridophyta.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) Lycopodium (Lycopsidea) and (b) Marsilea (Filicopsida).
3. Stelar evolution in Pteridophytes;
4. Heterospory and seed habit.

UNIT-II: Gymnosperms

5. General characteristics of Gymnosperms.
6. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) Cycas (Cycadopsida) and (b) Gnetum (Gnetopsida).
7. Outlines of geological time scale.
8. A brief account on Cycadeoidea.

UNIT-III: Basic aspects of Taxonomy

9. Aim and scope of taxonomy.
10. Plant nomenclature: Binomial system, ICBN- rules for nomenclature.
11. Herbarium and its techniques, concept of digital herbaria.
12. Bentham and Hooker system of classification;
13. Systematic description and economic importance of the following families: (a) Annonaceae (b) Curcubitaceae

UNIT-IV: Systematic Taxonomy

14. Systematic description and economic importance of the following families:
(a) Asteraceae (b) Asclepiadaceae (c) Euphorbiaceae and (d) Poaceae

UNIT-V: Phyto-geography

15. Principles of Phyto-geography, Distribution (wides, endemic, discontinuous species)
16. Endemism – types and causes.
17. Phyto-geographic regions of World.
18. Phyto-geographic regions of India.
19. Vegetation types in Andhra Pradesh.

Practical

Laboratory Exercises:

1. Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts :
 - a. **Pteridophytes:** *Lycopodium*, and *Marselia*.
 - b. **Gymnosperms:** *Cycas* and *Gnetum*
2. Study of fossil specimens of Cycadeoidea and Pentoxylon (photographs /diagrams can be shown if specimens are not available).
3. Demonstration of herbarium techniques.
4. Systematic / taxonomic study of locally available plants belonging to the families prescribed in theory syllabus. (Submission of 30 number of Herbarium sheets of wild plants with the standard system is mandatory).
5. Mapping of phyto-geographical regions of the globe and India

II BSC III SEMESTER – PAPER III BOTANY SYLLABUS 2022-2023

Title:Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

UNIT-I: Anatomy of Angiosperms

1. Organization of apical meristems: Tunica-carpus theory and Histogen theory.
2. Tissue systems–Epidermal, ground and vascular.
3. Anomalous secondary growth in Boerhaavia and Dracaena.
4. Study of timbers of economic importance - Teak, Red sanders and.

UNIT-II: Embryology of Angiosperms

5. Structure of anther, anther wall, types of tapetum. Microsporogenesis and development of male gametophyte.
6. Structure of ovule, megasporogenesis; monosporic (Polygonum), bisporic (Allium) and tetrasporic (Peperomia) types of embryo sacs.
7. Endosperm - Types and biological importance - Free nuclear, cellular, helobial and ruminant.
8. Development of Dicot (Capsella bursa-pastoris) embryo.

UNIT-III: Basics of Ecology

9. Ecology: definition, branches and significance of ecology.
10. Ecosystem: Concept and components, energy flow, food chain, food web, ecological pyramids.
11. Plants and environment: Climatic (light and temperature), edaphic and biotic factors.
12. Ecological succession: Hydrosere and Xerosere.

UNIT-IV: Population, Community and Production Ecology

13. Population ecology: Natality, mortality, growth curves, ecotypes, ecads
14. Community ecology: Frequency, density, cover, life forms, biological spectrum
15. Concepts of productivity: GPP, NPP
16. Ecosystems: Types of ecosystem, Biotic and abiotic components.

UNIT-V: Basics of Biodiversity

17. Biodiversity: Basic concepts, Convention on Biodiversity - Earth Summit.
18. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity
19. Biodiversity Hot spots in India.
20. Principles of conservation: IUCN threat-categories, RED data book
21. Role of NBPGR and NBA in the conservation of Biodiversity

Practical

Laboratory Exercises:

1. Tissue organization in root and shoot apices using permanent slides.
2. Anomalous secondary growth in stems of Boerhavia and Dracaena.
3. Study of anther and ovule using permanent slides/photographs.
4. Study of pollen germination and pollen viability.
5. Dissection and observation of Embryo sac haustoria in Santalum or Argemone.
6. Structure of endosperm (nuclear and cellular) using permanent slides / Photographs.
7. Dissection and observation of Endosperm haustoria in Crotalaria or Coccinia.
8. Developmental stages of dicot and monocot embryos using permanent slides / photographs.
9. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, rain gauge, and lux meter. (visit to the nearest/local meteorology station where the data is being collected regularly and record the field visit summary for the submission in the practical).
10. Study of morphological and anatomical adaptations of hydrophytes and xerophytes (02 each).
11. Quantitative analysis of herbaceous vegetation in the college campus for frequency, density and abundance.
12. Identification of vegetation/various plants in college campus and comparison with Raunkiaer's frequency distribution law.
13. Find out the alpha-diversity of plants in the area
14. Mapping of biodiversity hotspots of the world and India.

II BSC IV SEMESTER – PAPER IV BOTANY SYLLABUS 2022-2023

Title: Plant Physiology and Metabolism

UNIT-I: Plant-Water relations

1. Importance of water to plant life, physical properties of water, Diffusion, imbibition, osmosis. Water potential, osmotic potential, pressure potential.
2. Ascent of sap
3. Transpiration: stomata structure and mechanism of stomatal movements (K⁺ ion flux).

UNIT-II: Mineral nutrition, Enzymes and Respiration

4. Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency
5. Absorption of mineral ions; passive and active processes.
6. Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action.
7. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, Pentose Phosphate Pathway (HMP shunt).

UNIT-III: Photosynthesis

8. Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect.
9. Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation
10. Carbon assimilation pathways (C₃, C₄ and CAM);

UNIT-IV: Photorespiration and Nitrogen metabolism

11. Nitrogen metabolism: Biological nitrogen fixation – asymbiotic and symbiotic nitrogen fixing organisms.
12. Nitrogenase enzyme system.
13. Photorespiration - C₂ pathway

UNIT-V: Plant growth - development and stress physiology

14. Growth and Development: Definition, phases
15. Physiological effects of Plant Growth Regulators (PGRs) - auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids.
16. Physiology of flowering: Photoperiodism, Role of phytochrome in flowering.
17. Seed germination and senescence; physiological changes.

Practical

Laboratory Exercises:

1. Determination of osmotic potential of plant cell sap by plasmolytic method using Rhoeco/ Tradescantia leaves.
2. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
3. Determination of rate of transpiration using Cobalt chloride method / Ganong's potometer (at least for a dicot and a monocot).
4. Effect of Temperature on membrane permeability by colorimetric method.
5. Study of mineral deficiency symptoms using plant material/photographs.
6. Demonstration of amylase enzyme activity and study the effect of substrate and Enzymeconcentration.
7. Separation of chloroplast pigments using paper chromatography technique.
8. Demonstration of Polyphenol oxidase enzyme activity (Potato tuber or Apple fruit)
9. Anatomy of C3, C4 and CAM leaves.
10. Estimation of protein by biuret method/Lowry method
11. Minor experiments – Osmosis, Arc-auxonometer, ascent of sap through xylem, cytoplasmic streaming.

II BSC IV SEMESTER – PAPER V BOTANY SYLLABUS 2022-2023

Title: Cell biology, Genetics and Plant Breeding

UNIT – I: The Cell

1. Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plant cell.
2. Ultra-structure of cell wall.
3. Ultra-structure of plasma membrane and various theories on its organization.
4. Polymorphic cell organelles (Plastids); ultrastructure of chloroplast. Plastid DNA.

Unit – II: Chromosomes

5. Prokaryotic vs eukaryotic chromosome. Morphology of a eukaryotic chromosome.
6. Euchromatin and Heterochromatin; Karyotype and ideogram
7. Brief account of chromosomal aberrations - structural and numerical changes
8. Organization of DNA in a chromosome (solenoid and nucleosome models).

Unit – III: Mendelian and Non-Mendelian genetics

9. Mendel's laws of inheritance. Incomplete dominance and co-dominance; Multiple allelism.
10. A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3 point test cross.
11. Concept of maternal inheritance (Corren's experiment on *Mirabilis jalapa*); Mitochondrial DNA.

Unit – IV: Structure and functions of DNA

12. Watson and Crick model of DNA. Brief account on DNA Replication (Semiconservative method).
13. Brief account on Transcription, types and functions of RNA. Gene concept and genetic code and Translation.
14. Regulation of gene expression in prokaryotes - Lac Operon.

Unit – V: Plant Breeding

15. Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction and acclimatization.
16. Definition, procedure; applications and uses; advantages and limitations of : (a) Mass selection, (b) Pure line selection and (c) Clonal selection.
17. Hybridization – schemes, and technique; Heterosis (hybrid vigour).
18. A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP

Practical

Laboratory Exercises:

1. Study of ultra structure of plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/Aloe vera roots using squash technique; observation of various stages of mitosis in permanent slides.
3. Demonstration of Meiosis in P.M.C.s of *Allium cepa* flower buds using squash technique; observation of various stages of meiosis in permanent slides.
4. Study of structure of DNA and RNA molecules using models.
5. Solving problems monohybrid, dihybrid, back and test crosses.
6. Solving problems on gene interactions (at least one problem for each of the gene interactions in the syllabus).
7. Chromosome mapping using 3- point test cross data.
8. Demonstration of emasculation, bagging, artificial pollination techniques for hybridization.

III BSC V SEMESTER – PAPER VI BOTANY SYLLABUS 2022-2023

Title: 6B: Vegetable Crops – Cultivation Practices

(Skill Enhancement Course (Elective))

Unit – 1: Introduction to Olericulture

1. Vegetables and Olericulture: Definitions, nutritive value of vegetables and economic significance of vegetable farming.
2. Classification of vegetable crops (Botanical, based on climatic zones and economic parts used).
3. Types of vegetable gardens (kitchen gardening, terrace gardening, market gardening and truck gardening); implements used in vegetable gardening; vegetable forcing – a brief concept.

Unit – 2: Cultivation of leafy vegetables

1. Leafy vegetables: Definition and a brief account of locally cultivated crops.
2. Study of the following leafy vegetable crops: (a) Amaranthus (b) Palak (c) Hibiscus cannabinus (d) Fenugreek: systematic position, nutritive value, origin, area, production, improved varieties.
3. General cultivation practices such as sowing, planting distance, fertilizer requirements, irrigation, weed management, harvesting.
4. Crop specific yield, storage, disease and pest control and seed production.

Unit – 3: Cultivation of fruity vegetables

1. Fruity vegetables: Definition and a brief account of locally cultivated crops.
2. Study of the fruity vegetable crops: (a) Okra (b) Tomato (c) Chillies (d) Brinjal: systematic position, nutritive value, origin, area, production, improved varieties.
3. General cultivation practices such as sowing, planting distance, fertilizer requirements, irrigation, weed management, harvesting.
4. Crop specific yield- storage, disease and pest control and seed production

Unit – 4: Cultivation of peas and beans

1. A brief account of locally cultivated peas and beans.
2. Study of the following crops: (a) Dolichos (b) Cluster bean (c) French bean: Systematic position, nutritive value, origin, area, production, improved Varieties.
3. General cultivation practices such as sowing, planting distance, fertilizer requirements, irrigation, weed management, harvesting.
4. Crop specific yield, storage, disease and pest control and seed production.

Unit – 5: Cultivation of root and tuber crops

1. A brief account of locally cultivated root and tuber crops.
2. Study of the following crops: (a) Carrot (b) Radish (c) Sweet potato (d) Potato: Systematic position, family, nutritive value, origin, area, production, improved varieties.
3. General cultivation practices such as sowing, planting distance, fertilizer requirements, irrigation, weed management, harvesting.
4. Crop specific yield, storage, disease and pest control and seed production.

Practical

Laboratory Exercises:

1. Identification of seeds of important local vegetable plants and preparation of herbarium.
2. Identification of local vegetable crops and handling of garden tools.
3. Analysis of garden soil for ratios of physical characteristics by sieve separation.
4. Determination of chemical characters of garden soil (pH, EC, Organic Carbon, SAR).
5. Planning and layout of a vegetable crop farm.
6. Preparation of nursery bed (raised, sunken and flat beds) and sowing of seeds.
7. Transplanting and care of vegetable seedlings.
8. Intercultural operations in vegetable plots.
9. Estimation of Total Soluble Solids (TSS) by Refractometer in a fruit and a leafy vegetable.
10. Estimation of Vitamin - C in a fruit and a leafy vegetable by DCIP method.
11. Identification of pests and disease-causing organisms on any two vegetable plants.
12. Seed extraction in tomato and brinjal.

III BSC V SEMESTER – PAPER VII BOTANY SYLLABUS 2022-2023

Course 7B: Vegetable Crops – Post Harvest Practices

(Skill Enhancement Course (Elective)).

Unit – 1: Introduction to Post Harvest Practices

1. Post-harvest technology: Definition; importance, scope and future status of post-harvest management of vegetables.
2. Study of maturity standards of vegetables; harvest techniques of vegetables, methods stages, signs of harvesting; harvesting and its relationship with quality, sorting and grading.
3. Careful handling of harvested vegetables; pre-harvest and post-harvest factors responsible for ripening.

Unit – 2: Methods of storage

1. Climacteric and non-climacteric types of vegetables.
2. Methods of storage to prolong shelf life of harvested vegetables; on-farm storage, evaporatively cooled stores, ventilated storage, pit storage etc.
3. Refrigerated storage, refrigeration cycle, controlled and modified atmosphere, hypobaric storage.

Unit – 3: Processing of vegetables

1. Causes for spoilage of vegetables and control measures during storage; post-harvest disease and pest management.
2. Techniques to prevent deterioration; vegetable processing equipment; minimal processing of vegetables.
3. Safe chemicals and microbial limits; application of growth regulators for quality assurance; grading.

Unit -4: Preservation and value-addition

1. Importance and scope of vegetable preservation in India; principles underlying general methods of preservation.
2. Methods of preservation; food additives and food colours.
3. Fried products, process of frying; dried vegetables; sauces and chutneys, pickles and salted vegetables; by-product and waste utilization.

Unit – 5:Marketing

1. Packing line operations, packaging of vegetables and their products; transportation; codex norms for export of perishables.
2. Demand supply analysis of important vegetables; market potential of various vegetables products.
3. Important marketing agencies and institutions; importance of cooperative marketing.

Practical

Laboratory Exercises:

1. Maturity selection and harvest, harvesting practices.
2. List and cost of equipment, utensils, and additives required for small scale process in industry.
3. Study of different types of spoilages in fresh as well as processed vegetables.
4. Identification and classification of spoilage organisms.
5. Estimation of total carbohydrates (Anthrone method) in a stored vegetable and unstored vegetable.
6. Estimation of protein (Lowry method) in a stored vegetable and un-stored vegetable.
7. Sensory evaluation of fresh and processed vegetables.
8. Assessment of quality and grading, pre-packaging and protective treatments.
9. Identification of packaging materials, containers for packaging.
10. Preparation of pickle from a vegetable.
11. Preparation of tomato sauce, ketchup and chutney.

Syllabus for Botany Skill Development Course: 2022 - 2023

Plant Nursery – I Semester

Unit-I: Introduction to plant nursery

1. Plant nursery: Definition, importance.
2. Different types of nurseries –on the basis of duration, plants produced, structure used.
3. Basic facilities for a nursery; layout and components of a good nursery.
4. Plant propagation structures in brief.
5. Bureau of Indian Standards (BIS-2008) related to nursery.

Unit-II: Necessities for nursery

6. Nursery beds – types and precautions to be taken during preparation.
7. Growing media, nursery tools and implements, and containers for plant nursery, in brief.
8. Seeds and other vegetative material used to raise nursery in brief.
9. Outlines of vegetative propagation techniques to produce planting material.
10. Sowing methods of seeds and planting material.

Unit-III: Management of nursery

11. Seasonal activities and routine operations in a nursery. Plantation & Irrigation management.
12. Nursery management – watering, weeding and nutrients; pests and diseases.
13. Common possible errors in nursery activities.
14. Economics of nursery development, pricing and record maintenance.
15. Online nursery information and sales systems.

Syllabus for Botany Skill Development Course: 2022– 2023

FRUITS AND VEGETABLES PRESERVATION – II Semester

Unit – 1 : Introduction to fruits and vegetables

1. Fruits: Definition, elementary knowledge on types of fruits (fleshy and dry) with local /common examples.
2. Vegetables: Definition, elementary knowledge on types of vegetables (root, leafy, stem, flower and fruit) with local/ common examples.
3. Importance of fruits and vegetables in human nutrition.
4. Concept of perishable plant products – maturation and spoilage, shelf life; preservation – definition and need for preservation of fruits and vegetables.

Unit – 2 : Preservation of Fruit

1. Fruits – ripening and biological aging; storage and preservation concerns.
2. Preservation of fresh fruits at room temperature and in cold storage.
3. Fruit preservation at room temperature as juices, squashes and syrups.
4. Preservation of fruits by application of heat; making of fruit products (jams, jellies and fruit slices in processing factories).
5. Preservation by dehydration (Eg. banana chips), application of sugar (Eg. mango candy), application of salt (pickling).
6. Fruit preservation by freezing – storage at the lowest temperatures.

Unit – 3 : Preservation of vegetables

1. Vegetables – losses after harvesting and causes; problems in handling and storage.
2. Modern methods of packaging and storage to reduce losses.
3. Trimming of vegetables and packing in cartons; dehydration technique -factory processing.
4. Making of vegetable products (flakes/chips of potato and onion; garlic powder).
5. Frozen vegetables – Carrots, Cauliflower, Okra and Spinach.
6. Preservation of sliced vegetables in factories by canning and bottling.

SYLLABUS OF
LIFE SKILL COURSES - 2022 – 2023
ENVIRONMENTAL EDUCATION- III Semester

Unit 1: Environment and Natural Resources

1. Multidisciplinary nature of environmental education; scope and importance.
2. Man as an integral product and part of the Nature.
3. A brief account of land, forest and water resources in India and their importance.
4. Biodiversity: Definition; importance of Biodiversity - ecological, consumptive, productive, social, ethical and moral, aesthetic, and option value.
5. Levels of Biodiversity: genetic, species and ecosystem diversity.

Unit 2: Environmental Degradation and Impacts

1. Human population growth and its impacts on environment; land use change, land degradation, soil erosion and desertification.
2. Use and over-exploitation of surface and ground water, construction of dams, floods, conflicts over water (within India).
3. Deforestation: Causes and effects due to expansion of agriculture, firewood, mining, forest fires and building of new habitats.
4. Non-renewable energy resources, their utilization and influences.
5. A brief account of air, water, soil and noise pollutions; Biological, industrial and solid wastes in urban areas. Human health and economic risks.
6. Green house effect - global warming; ocean acidification, ozone layer depletion, acid rains and impacts on human communities and agriculture.
7. Threats to biodiversity: Natural calamities, habitat destruction and fragmentation, overexploitation, hunting and poaching, introduction of exotic species, pollution, predator and pest control.

Unit 3: Conservation of Environment

1. Concepts of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation.
2. Control measures for various types of pollution; use of renewable and alternate sources of energy.
3. Solid waste management: Control measures of urban and industrial waste.
4. Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
5. Environment Laws: Environment Protection Act; Wildlife Protection Act; Forest Conservation Act.
6. International agreements: Montreal and Kyoto protocols; Environmental movements: Bishnoi of Rajasthan, Chipko, Silent valley.

Syllabus for Botany Certificate Course: 2022 - 2023

Herbal Therapy

- I. Introduction and scope of medicinal plants.
- II. Collection and preservation of important medicinal plants.
- III. Visit to medicinal important industries and organizations.

IV. Study of the following plants and plant products:

a. Home remedies

1. *Curcuma longa* – Turmeric,
2. *Zingiber officinale* - Ginger
3. *Piper nigrum* - Pepper
4. *Allium sativum* - Garlic
5. *Elettaria cardamomum* - Cardamom
6. *Cinnamomum zeylanicum* - Cinnamon
7. *Cuminum cyminum* - Cumin
8. *Syzygium Aromaticum* –Cloves
9. *Trigonella foenum graecum* – Fenugreek
10. *Ferula asafetida* – Asafoetida

b. Medicinal importance of the following plants

11. *Centella asiatica* – Brahmi
12. *Eclipta alba* – GuntaGalagara
13. *Aloe vera* – Kalabanda
14. *Coriandrum sativum* – Coriander
15. *Mentha arvensis* – Pudina
16. *Ocimum sanctum* –Tulasi
17. *Azadirachta indica* – Neem
18. *Gymnema sylvestris* – Podapatri
19. *Hibiscus rosa sinensis* – Mandara
20. *Murrayakoenigii* - Curry leaf

c. Medicinal importance of the following fruits

21. *Annona squamosa* - Custard apple
22. *Carica papaya* - Papaya
23. *Citrus aurantifolia* - Lime
24. *Punica grnatum* - Pomo granite
25. *Phyllanthus emblica* – Amla

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.

ZOOLOGY SYLLABUS- 2022-2023

ZOOLOGY PAPER TITLES

	Semester	Paper	Title of the Paper
I Year	I	I	Animal Diversity-I Biology of Non-Chordates
	II	II	Animal Diversity-II Biology of Chordates
II Year	III	III	Cell Biology, Genetics, Molecular Biology & Evolution
	IV	IV	Physiology, Cellular Metabolism and Embryology
		V	Immunology and Animal Biotechnology
III Year	V	VI	Sustainable Aquaculture Management
	V	VII	Post Harvest Technology of Fish and Fisheries

Skill Development Course for I B.Sc II Semester Biology Stream- Dairy Technology

Skill Development Course for I B.Sc, III Semester Biology Stream- Environmental Audit

CH.S.D.St Theresa's Autonomous College for Women, Eluru
I B.Sc, 2022- 2023
ZOOLOGY SYLLABUS

I B.Sc, I Semester, Paper – I

ANIMAL DIVERSITY – BIOLOGY OF NON CHORDATES

HOURS. 60

MAX. MARKS.100

Course Outcomes:

By the completion of the course the graduate should able to –

CO1 Describe general taxonomic rules on animal classification

CO2 Classify Protozoa to Coelenterata with taxonomic keys

CO3 Classify Phylum Platyhelminthes to Annelida phylum using examples from parasitic adaptation and vermicomposting

CO4 Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscs

CO5 Describe Echinodermata to Hemichordata with suitable examples and larval stages in relation to the phylogeny

Objectives:

1. To understand the taxonomic position of protozoa to helminthes.
2. To understand the general characteristics of animals belonging to protozoa to hemichordata.
3. To understand the structural organization of animals phylum from protozoa to hemichordata.
4. To understand the origin and evolutionary relationship of different phyla from protozoa to hemichordata.
5. To understand the origin and evolutionary relationship of different phylum from annelids to hemichordates.

UNIT I

1.1 Outline Classification of Animal Kingdom

1.2 General Characters of Non-Chordates

Phylum Protozoa

1.3 General Characters and classification of protozoa up to classes with suitable examples

1.4 Locomotion, Nutrition and Reproduction in Protozoans

1.5 *Elphidium* (type study)

UNIT –II

Phylum Porifera

2.1 General characters and classification up to classes with suitable examples

2.2 Skeleton in Sponges

2.3 Canal system in sponges

Phylum Coelenterata

2.4 General characters and classification up to classes with suitable examples

2.5 Metagenesis in *Obelia*

2.6 Polymorphism in coelenterates

2.7 Corals and coral reefs

Phylum Ctenophora:

2.8 General Characters and Evolutionary significance (affinities)

Unit – III

Phylum Platyhelminthes

3.1 General characters and classification up to classes with suitable examples

3.2 Life cycle and pathogenicity of *Fasciola hepatica*

3.3 Parasitic Adaptations in helminthes

Phylum Nemathelminthes

3.4 General characters and classification up to classes with suitable examples

3.5. Life cycle and pathogenicity of *Ascaris lumbricoides*

Unit – IV

Phylum Annelida

4.1 General characters and classification up to classes with suitable examples

4.2 Evolution of Coelom and Coelomoducts

4.3 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost

Phylum Arthropoda

4.4 General characters and classification up to classes with suitable examples

4.5 Vision and Respiration in Arthropoda

4.6 Metamorphosis in Insects

4.7 *Peripatus* - Structure and affinities

4.8 Social Life in Bees and Termites

Unit – V

Phylum Mollusca

5.1 General characters and classification up to classes with suitable examples

5.2 Pearl formation in Pelecypoda

5.3 Sense organs in Mollusca

Phylum Echinodermata

5.4 General characters and classification up to classes with suitable examples

5.5 Water vascular system in star fish

5.6 Larval forms of Echinodermata

Phylum Hemichordata

5.7 General characters and classification up to classes with suitable examples

5.8 *Balanoglossus* - Structure and affinities

Additional Input: Sericulture

Co-curricular activities (suggested)

-Preparation of chart/model of phylogenic tree of life, 5-kingdom classification, *Elphidium* life cycle etc.

- Visit to Zoology museum or Coral island as part of Zoological tour

- Charts on life cycle of *Obelia*, polymorphism, sponge spicules

-Clay models of canal system in sponges

- Preparation of charts on life cycles of *Fasciola* and *Ascaris*

- Visit to adopted village and conducting awareness campaign on diseases, to people as part of Social Responsibility.

-Plaster-of-paris or Thermocol model of *Peripatus*

- Construction of a vermicompost in each college, manufacture of manure by students and donating to local farmers

-Models of compound eye, bee hive and terminarium (termitaria) by students

- Visit to apiculture centre and short-term training as part of apprenticeship programme of the govt. Of Andhra Pradesh

- Chart on pearl forming layers using clay or Thermocol

-Visit to a pearl culture rearing industry/institute

- Live model of water vascular system

- Phylogeny chart on echinoderm larvae and their evolutionary significance

- Preparation of charts depicting the feeding mechanism, 3 coeloms, tornaria larva etc., of *Balanoglossus*

REFERENCE BOOKS

1. **L.H. Hyman** '*The Invertebrates*' Vol I, II and V. – M.C. Graw Hill Company Ltd.
2. **Kotpal, R.L. 1988 - 1992** Protozoa, Porifera, Coelenterata, Helminthes, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
3. **E.L. Jordan and P.S. Verma** '*Invertebrate Zoology*' S. Chand and Company.
4. **R.D. Barnes** '*Invertebrate Zoology*' by: W.B. Saunders CO., 1986.
5. **Barrington. E.J.W.**, '*Invertebrate structure and Function*' by ELBS.
- 6 **P.S. Dhama and J.K. Dhama**. Invertebrate Zoology. S. Chand and Co. New Delhi.
7. **Parker, T.J. and Haswell**'*A text book of Zoology*' by, W.A., Mac Millan Co. London.
8. **Barnes, R.D. (1982)**. *Invertebrate Zoology*, V Edition”
9. **R.L. kotpal**-Modern Text Book Of Zoology Invertebrates
- 10.**Arumugam et.al.**,-A Text Book of Invertebrates
11. **Saras Publication** -Economic Zoology

CH.S.D.St Theresa's Autonomous College for Women, Eluru
I B.Sc, Zoology I Semester, Practical – I syllabus, 2022- 2023
ANIMAL DIVERSITY - BIOLOGY OF NONCHORDATES

Periods.24

Max Marks. 50

Learning Outcomes:

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labeled record of identified museum specimens

Syllabus :

1. Study of museum slides / specimens / models (Classification of animals up to orders)

Protozoa: Amoeba, *Paramoecium*, *Paramoecium Binary fission and Conjugation*, *Vorticella*, *Entamoeba histolytica*, *Plasmodium vivax*

Porifera: *Sycon*, *Spongilla*, *Euspongia*, *Sycon*- T.S & L.S, Spicules, Gemmule

Coelenterata: *Obelia – Colony & Medusa*, *Aurelia*, *Physalia*, *Velella*, *Corallium*, *Gorgonia*, *Pennatula*.

Platyhelminthes: *Planaria*, *Fasciola hepatica*, *Fasciola* larval forms – Miracidium, Redia, Cercaria, *Echinococcus granulosus*, *Taeniasolium*, *Schistosoma haematobium*vii.

Nemathelminthes: *Ascaris*(Male & Female), *Drancunculus*, *Ancylostoma*, *Wuchereria*

Annelida: *Nereis*, *Aphrodite*, *Chaetopteurs*, *Hirudinaria*, Trochophore larva

Arthropoda: Cancer, Palaemon, Scorpion, *Scolopendra*, *Sacculina*, *Limulus*, *Peripatus*, Larvae - Nauplius, Mysis, Zoea, Mouth parts of male & female *Anopheles* and *Culex*, Mouthparts of Housefly and Butterfly. xiii.

Mollusca: *Chiton*, *Pila*, *Unio*, *Pteredo*, *Murex*, *Sepia*, *Loligo*, *Octopus*, *Nautilus*, Glochidium larva

Echinodermata: *Asterias*, *Ophiothrix*, *Echinus*, *Clypeaster*, *Cucumaria*, *Antedon*, Bipinnaria larva

Hemichordata: *Balanoglossus*, Tornaria larva

2. Dissections:

1. Prawn: Appendages, Digestive system, Nervous system, Mounting of Statocyst

2. Insect Mouth Parts

3. Laboratory Record work shall be submitted at the time of practical examination

4. An “**Animal album**” containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose

5. Computer - aided techniques should be adopted or show virtual dissections

REFERENCE MANUALS:

1. Practical Zoology- Invertebrates S.S. Lal

2. Practical Zoology - Invertebrates P.S. Verma

3. Practical Zoology - Invertebrates K.P. Kurl

4. Ruppert and Barnes (2006) Invertebrate Zoology, 8th Edition, Holt Saunders International Edition

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
I B.Sc, 2022- 2023
ZOOLOGY SYLLABUS
I B.Sc, II Semester

PAPER – II: ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

Hours. 60

Marks. 100

Course Outcomes:

By the completion of the course the graduate should be able to -

CO1 Describe general taxonomic rules on animal classification of chordates

CO2 Classify Protochordata to Mammalia with taxonomic keys

CO3 Understand Mammals with specific structural adaptations

CO4 Understand the significance of dentition and evolutionary significance

CO5 Understand the origin and evolutionary relationship of different phyla from Protochordata to mammalia.

Learning objectives

1. To understand the animal kingdom.
2. To understand the taxonomic position of Protochordata to Mammalia.
3. To understand the general characteristics of animals belonging to Fishes to Reptilians.
4. To understand the body organization of Chordata.
5. To understand the taxonomic position of Protherian mammals.

Unit - I

1.1 General characters and classification of Chordata upto classes

1.2 Protochordata- Salient features of Cephalochordata, Affinities of Cephalochordata.

1.3 Salient features of Urochordata

1.4 Structure and life history of *Herdmania*

1.5 Retrogressive metamorphosis –Process and Significance

Unit - II

2.1 Cyclostomata, General characters, Comparison of *Petromyzon* and *Myxine*

2.2 Pisces : General characters of Fishes

2.3 *Scoliodon*: External features, Digestive system, Respiratory system, Structure and function of Heart, Structure and functions of the Brain.

2.4 Migration in Fishes

2.5 Types of Scales

2.6 Dipnoi

Unit - III

3.1 General characters of Amphibia

3.2 Classification of Amphibia up to orders with examples.

3.3 *Rana hexadactyla*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and functions of the Brain

3.4 Reptilia: General characters of Reptilia, Classification of Reptilia upto orders with examples

3.5 *Calotes*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and function of Brain

3.6. Identification of Poisonous snakes; Skull in reptiles

Unit - IV

4.1 Aves General characters of Aves

4.2 *Columba livia*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and function of Brain

4.3 Migration in Birds

4.4 Flight adaptation in birds

Unit - V

5.1 General characters of Mammalia

5.2 Classification of Mammalia up to sub - classes with examples

5.3 Comparison of Prototherians, Metatherians and Eutherians

5.4 Dentition in mammals

Additional Input:

1. Maintenance of Aviary
2. Preparation of Micro prepared slides
3. Basics of Taxidermy

Co-curricular activities (suggested)

- Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis
- Thermocol or Clay models of Herdmania and Amphioxus
- Visit to local fish market and identification of local cartilaginous and bony fishes
- Maintaining of aquarium by students
- Thermocol model of fish heart and brain
- Preparation of slides of scales of fishes
- Visit to local/nearby river to identify migratory fishes and prepare study notes
- Preparation of Charts on above topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- Additional input on types of snake poisons and their antidotes (student activity).
- Collection of bird feathers and submission of report on Plumology
- Taxidermic preparation of dead birds for Zoology museum
- Map pointing of prototherian and metatherian mammals
- Chart preparation for dentition in mammals

REFERENCE BOOKS

- J.Z. Young, 2006. The life of vertebrates. (The Oxford University Press, New Delhi). 646 pages. Reprinted
- Arumugam, N. Chordate Zoology, Vol. 2. Saras Publication. 278 pages. 200 figs.
- A.J. Marshall, 1995. Textbook of zoology, Vertebrates. (The McMillan Press Ltd., UK). 852 pages. (Revised edition of Parker & Haswell, 1961).
- M. Ekambaranatha Ayyar, 1973. A manual of zoology. Part II. (S. Viswanathan Pvt. Ltd., Madras).
- P.S. Dhama & J.K. Dhama, 1981. Chordate zoology. (R. Chand & Co.). 550 pages.
- Gurdarshan Singh & H. Bhaskar, 2002. Advanced Chordate Zoology. Campus Books, 6 Vols., 1573 pp., tables, figs.
- A.K. Sinha, S. Adhikari & B.B. Ganguly, 1978. Biology of animals. Vol. II. Chordates. (New Central Book Agency, Calcutta). 560 pages.
- R.L. Kotpal, 2000. Modern textbook of zoology, Vertebrates. (Rastogi Publ., Meerut). 632 pages.
- E.L. Jordan & P.S. Verma, 1998. Chordate zoology. (S. Chand & Co.). 1092 pages.

- G.S. Sandhu, 2005. Objective Chordate Zoology. Campus Books, vii, 169 pp.
- Sandhu, G.S. & H. Bhaskar, H. 2004. Textbook of Chordate Zoology. Campus Books, 2 vols., xx, 964 p., figs.
- Veena, 2008. Lower Chordata. (Sonali Publ.), 374 p., tables, 117 figs.

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
I B.Sc, 2022- 2023
ZOOLOGY SYLLABUS
I B.Sc, II Semester

PAPER – II: ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

PRACTICAL-II

Learning Outcomes:

- To understand the taxidermic and other methods of preservation of chordates
- To identify chordates based on special identifying characters
- To understand internal anatomy of animals through demo or virtual dissections, thus directing the student for “empathy towards the fellow living beings”
- To maintain a neat, labeled record of identified museum specimens

OBSERVATION OF THE FOLLOWING SLIDES / SPOTTERS / MODELS

1. Protochordata :*Herdmania, Amphioxus, Amphioxus* T.S through pharynx.
2. Cyclostomata :*Petromyzon and Myxine*.
3. Pisces : *Pristis, Torpedo, Hippocoampus, Exocoetus, Echeneis, Labeo, Catla, Clarius, Channa, Anguilla*.
4. Amphibia :*Ichthyophis, Amblystoma, Axolotl larva, Hyla*,
5. Reptilia: *Draco, Chamaeleon, Uromastix, Testudo, Trionyx, Russels viper, Naja, Krait, Hydrophis, Crocodile*.
6. Aves : *Psittacula, Eudynamus, Bubo, Alcedo*.
7. Mammalia: *Ornithorhynchus, Pteropus, Funambulus*.

Dissections-

1. *Scoliodon* IX and X, Cranial nerves
2. *Scoliodon* Brain
3. Mounting of fish scales

Note: 1. Dissections are to be demonstrated only by the faculty or virtual.

2. Laboratory Record work shall be submitted at the time of practical examination

REFERENCE BOOKS:

1. S.S.Lal, Practical Zoology – Vertebrata
2. P.S.Verma, A manual of Practical Zoology – Chordata

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
II B.Sc- III Semester 2022- 2023
ZOOLOGY SYLLABUS

**PAPER – III: CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND
EVOLUTION**

Course Outcomes:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell Biology, Animal Biotechnology and Evolution and by the completion of the course the graduate shall able to –

CO1 To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.

CO2 Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.

CO3 To understand the history of origin of branch of genetics, gain knowledge on heredity, interaction of genes, various types of inheritance patterns existing in animals

CO4 Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination, human karyotyping and mutations of chromosomes resulting in various disorders

CO5 Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins.

CO6 Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals for the benefit of the society

Learning Objectives

- To understand the origin of cell and distinguish between prokaryotic and eukaryotic cell
- To understand the role of different cell organelles in maintenance of life activities
- To provide the history and basic concepts of heredity, variations and gene interaction
- To enable the students distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance.
- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings
- To provide knowledge on origin of life, theories and forces of evolution
- To understand the role of variations and mutations in evolution of organisms

SYLLABUS:

Unit – I Cell Biology

1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma

1.2 Electron microscopic structure of animal cell.

1.3 Plasma membrane –Models and transport functions of plasma membrane.

1.4 Structure and functions of Golgi complex, Endoplasmic Reticulum and Lysosomes

1.5 Structure and functions of Ribosomes, Mitochondria, Nucleus, Chromosomes

(Note: 1. General pattern of study of each cell organelle – Discovery, Occurrence, Number, Origin, Structure and Functions with suitable diagrams)

2. Need not study cellular respiration under mitochondrial functions)

Unit – II Genetics - I

2. 1 Mendel's work on transmission of traits

2. 2 Gene Interaction – Incomplete Dominance, Codominance, Lethal Genes

2. 3 Polygenes (General Characteristics & examples); Multiple Alleles (General Characteristics and Blood group inheritance)
2. 4 Sex determination (Chromosomal, Genic Balance, Hormonal, Environmental and Haplo-diploidy types of sex determination)
2. 5 Sex linked inheritance (X-linked, Y-linked & XY-linked inheritance)

Unit – III Genetics - II

- 3.1 Mutations & Mutagenesis
- 3.2 Chromosomal Disorders (Autosomal and Allosomal)
- 3.3 Human Genetics – Karyotyping, Pedigree Analysis (basics)
- 3.4 Basics on Genomics and Proteomics

Unit IV: Molecular Biology

- 4.1 Central Dogma of Molecular Biology
- 4.2 Basic concepts of -
 - a. DNA replication – Overview (Semi-conservative mechanism, Semi-discontinuous mode, Origin & Propagation of replication fork)
 - b. Transcription in prokaryotes – Initiation, Elongation and Termination, Post-transcriptional modifications (basics)
 - c. Translation – Initiation, Elongation and Termination
- 4.3 Gene Expression in prokaryotes (Lac Operon); Gene Expression in eukaryotes

Unit - V :Evolution

- 5.1 Origin of life
 - 5.2 Theories of Evolution: Lamarckism, Darwinism, Germ Plasm Theory, Mutation Theory
 - 5.3 Neo-Darwinism: Modern Synthetic Theory of Evolution, Hardy-Weinberg Equilibrium
 - 5.4 Forces of Evolution: Isolating mechanisms, Genetic Drift, Natural Selection, Speciation
- Additional Input:** Cytoplasmic Inheritance

Co-curricular activities (Suggested)

- Model of animal cell
- Working model of mitochondria to encourage creativity among students
- Photo album of scientists of cell biology
- Charts on plasma membrane models/cell organelles
- Observation of Mendelian / Non-Mendelian inheritance in the plants of college botanical garden or local village as a student study project activity
- Observation of blood group inheritance in students, from their parents and grand parents
- Karyotyping and preparation of pedigree charts for identifying diseases in family history
- Charts on chromosomal disorders
- Charts on central dogma/lac operon/genetic code
- Model of semi-conservative model of DNA replication
- Model of tRNA and translation mechanism
- Power point presentation of transcription or any other topic by students
- Draw geological time scale and highlight important events along the time line
- Chart on industrial melanism to teach directed selection, Darwin's finches to teach genetic drift, collection of data on weight of children born in primary health centres to teach stabilizing selection etc.

REFERENCES:

1. Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell 'Molecular Cell Biology' W.H.Freeman and company New York.
2. Cell Biology by De Robertis
3. Bruce Alberts, Molecular Biology of the Cell
4. Rastogi, Cytology
5. Varma & Aggarwal, Cell Biology
6. C.B. Pawar, Cell Biology
7. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008).Principles of Genetics. VIII Edition. Wiley India.
8. Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John Wiley and Sons Inc.
9. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition. Benjamin Cummings.
10. Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition. Benjamin Cummings.
11. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis. IX Edition. W. H. Freeman and Co.
12. Ridley, M. (2004). Evolution. III Edition. Blackwell Publishing
13. Molecular Biology by freifielder
14. Instant Notes in Molecular Biology by Bios scientific publishers and Viva Books Private Limited
15. Hall, B. K. and Hallgrimsson, B. (2008). Evolution. IV Edition. Jones and Bartlett Publishers
16. Campbell, N. A. and Reece J. B. (2011). Biology. IX Edition, Pearson, Benjamin, Cummings.
17. Douglas, J. Futuyma (1997). Evolutionary Biology. Sinauer Associates.
18. Minkoff, E. (1983). Evolutionary Biology. Addison-Wesley.
19. James D. Watson, Nancy H. Hopkins 'Molecular Biology of the Gene'
20. Jan M. Savage. Evolution, 2nd ed, Oxford and IBH Publishing Co., New Delhi.
21. Gupta P.K., 'Genetics

CH.S.D.St. Theresa's Autonomous College for Women, Eluru
II B.Sc- Zoology- III Semester, Practical III Syllabus, 2022- 2023
PAPER - III :CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND
EVOLUTION

Learning Objectives:

- Acquainting and skill enhancement in the usage of laboratory microscope
- Hands-on experience of different phases of cell division by experimentation
- Develop skills on human karyotyping and identification of chromosomal disorders
- To apply the basic concept of inheritance for applied research
- To get familiar with phylogeny and geological history of origin & evolution of animals

I. Cell Biology

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis and Meiosis with prepared slides
3. Mounting of salivary gland chromosomes of *Chironomus*

II. Genetics

1. Study of Mendelian inheritance using suitable examples and problems
2. Problems on blood group inheritance and sex linked inheritance
3. Study of human karyotypes (Down's syndrome, Edwards syndrome, Patau syndrome, Turner's syndrome and Klinefelter syndrome)

III. Evolution

1. Study of fossil evidences
2. Study of homology and analogy from suitable specimens and pictures
3. Phylogeny of Human with pictures
4. Study of Genetic Drift by using examples of Darwin's finches (pictures)
5. Visit to Natural History Museum and submission of report

REFERENCE BOOKS

1. Burns GW. 1972. *The Science of Genetics. An Introduction to Heredity*. Mac Millan Publ. Co.Inc.
2. Gardner EF. 1975. *Principles of Genetics*. John Wiley & Sons, Inc. New York.
3. Harth and Jones EW. 1998. *Genetics – Principles and Analysis*. Jones and BarHett Publ. Boston.
4. Levine L. 1969. *Biology of the Gene*. Toppan.
5. Pedder IJ. 1972. *Genetics as a Basic Guide*. W. Norton & Company, Inc.
6. Rastogi VB. 1991. *A Text Book of Genetics*.KedarNath Ram Nath Publications, Meerut, Uttar Pradesh, India.
7. Rastogi VB. 1991. *Organic Evolution*.KedarNath Ram Nath Publications, Meerut,Uttar Pradesh, India.
8. Stahl FW. 1965. *Mechanics of Inheritance*. Prentice-Hall.
9. White MJD. 1973. *Animal Cytology and Evolution*. Cambridge Univ.

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**II B.Sc - 2022- 2023
ZOOLOGY SYLLABUS**

II B.Sc, IV Semester, Paper – IV

**PAPER – IV: ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND
EMBRYOLOGY**

Hours. 60

Marks.100

Course Outcomes:

This course will provide students with a deep knowledge in Physiology, Cellular metabolism and Molecular Biology and by the completion of the course the graduate shall able to –

CO1 Understand the functions of important animal physiological systems including digestion, cardio-respiratory and renal systems.

CO2 Understand the muscular system and the neuro-endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction.

CO3 Describe the structure, classification and chemistry of biomolecules and enzymes responsible for sustenance of life in living organisms

CO4 Develop broad understanding the basic metabolic activities pertaining to the catabolism and anabolism of various biomolecules

CO5 Describe the key events in early embryonic development starting from the formation of gametes up to gastrulation and formation of primary germ layers.

Learning Objectives

- To achieve a thorough understanding of various aspects of physiological systems and their functioning in animals.
- To instil the concept of hormonal regulation of physiology, metabolism and reproduction in animals.
- To understand the disorders associated with the deficiency of hormones
- To demonstrate a thorough knowledge of the intersection between the disciplines of Biology and Chemistry.
- To provide insightful knowledge on the structure and classification of carbohydrates, proteins, lipids and enzymes
- To demonstrate an understanding of fundamental biochemical principles such as the function of biomolecules, metabolic pathways and the regulation of biochemical processes
- To make students gain proficiency in laboratory techniques in biochemistry and orient them to apply the scientific method to the processes of experimentation and hypothesis testing.

UNIT I Animal Physiology - I

1.1 Process of digestion and assimilation

1.2 Respiration - Pulmonary ventilation, transport of oxygen and CO₂

(Note: Need not study cellular respiration here)

1.3 Circulation - Structure and functioning of heart, Cardiac cycle

1.4 Excretion - Structure and functions of kidney urine formation, counter current Mechanism

UN IT II Animal Physiology - II

2.1 Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers

2.2 Muscle contraction - Ultra structure of muscle, molecular and chemical basis of muscle contraction

2.3 Endocrine glands - Structure, functions of hormones of pituitary, thyroid, parathyroid, adrenal glands and pancreas

2.4 Hormonal control of reproduction in a mammal

UNIT III Cellular Metabolism – I (Biomolecules)

3.1 Carbohydrates - Classification of carbohydrates. Structure of glucose

3.2 Proteins - Classification of proteins. General properties of amino acids

3.3 Lipids - Classification of lipids

3.4 Enzymes: Classification and Mechanism of Action

UNITIV Cellular Metabolism – II

4.1 Carbohydrate Metabolism - Glycolysis, Krebs cycle, Electron Transport Chain, Glycogen metabolism, Gluconeogenesis

4.2 Lipid Metabolism – β -oxidation of palmitic acid

4.3 Protein metabolism - Transamination, Deamination and Urea Cycle

Unit – V Embryology

5.1 Gametogenesis

5.2 Fertilization

5.3 Types of eggs

5.4 Types of cleavages

5.5 Development of Frog upto formation of primary germ layers

Additional Input:

Key events in early embryonic development in Human

Co-curricular activities (Suggested)

-Chart on cardiac cycle, human lung, kidney/nephron structure etc.

-Working model of human / any mammalian heart.

-Chart of sarcomere/location of endocrine glands in human body

- Chart affixing of photos of people suffering from hormonal disorders

-Student study projects such as identification of incidence of hormonal disorders in the local primary health centre, studying the reasons thereof and measures to curb or any other as the lecturer feels good in nurturing health awareness among students

-Chart on structures of biomolecules/types of amino acids (essential and non-essential)Chart preparation by students on Glycolysis / kreb's cycle/urea cycle etc.

- Model of electron transport chain

-Preparation of models of different types of eggs in animals

-Chart on frog embryonic development, fate map of frog blastula, cleavage etc.

REFERENCE BOOKS

1. Eckert H. *Animal Physiology: Mechanisms and Adaptation*. W.H. Freeman & Company.

2. Flöray E. *An Introduction to General and Comparative Animal Physiology*. W.B. Saunders Co., Philadelphia.

3. Goel KA and Satish KV. 1989. *A Text Book of Animal Physiology*, Rastogi Publications, Meerut, U.P.

4. Hoar WS. *General and Comparative Physiology*. Prentice Hall of India, New Delhi.

5. Lehninger AL. Nelson and Cox. *Principles of Biochemistry*. Lange Medical Publications, New Delhi.

6. Prosser CL and Brown FA. *Comparative Animal Physiology*. W.B. Saunders Company, Philadelphia.

7. *Developmental Biology* by Balinsky

8. *Developmental Biology* by Gerard Karp

9. *Chordate embryology* by Varma and Agarwal

10. Embryology by V.B. Rastogi
11. Austen CR and Short RV. 1980. *Reproduction in Mammals*. Cambridge University Press.
12. Gilbert SF. 2006. *Developmental Biology*, 8th Edition. Sinauer Associates Inc., Publishers, Sunderland, USA.
13. Longo FJ. 1987. *Fertilization*. Chapman & Hall, London.
14. Rastogi VB and Jayaraj MS. 1989. *Developmental Biology*. KedaraNath Ram Nath Publishers, Meerut, Uttar Pradesh.
15. Schatten H and Schatten G. 1989. *Molecular Biology of Fertilization*. Academic Press, New York.

CH.S.D.St. Theresa's Autonomous College for Women, Eluru

II B.Sc. Zoology, IV Semester, Practical - IV, 2022- 2023
ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY

Learning Objectives:

- Identification of an organ system with histological structure
- Deducing human health based on the information of composition of blood cells
- Demonstration of enzyme activity *in vitro*
- Identification of various biomolecules of tissues by simple colorimetric methods and also quantitative methods
- Identification of different stages of earl embryonic development in animals

I. ANIMAL PHYSIOLOGY

1. Qualitative tests for identification of carbohydrates, proteins and fats
2. Study of activity of salivary amylase under optimum conditions
3. T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage
4. Differential count of human blood

II. CELLULAR METABOLISM

1. Estimation of total proteins in given solutions by Lowry's method.
2. Estimation of total carbohydrate by Anthrone method.
3. Qualitative tests for identification of ammonia, urea and uric acid
4. Protocol for Isolation of DNA in animal cells

III. EMBRYOLOGY

1. Study of T.S. of testis, ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8 cell stages)
3. Construction of fate map of frog blastula

REFERENCE BOOKS:

- Harper's Illustrated Biochemistry
- Cell and molecular biology: Concepts & experiments. VI Ed. John Wiley &sons. Inc.
- Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd.
- Laboratory techniques by Plummer

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**II B.Sc - 2022- 2023
ZOOLOGY SYLLABUS**

II B.Sc, IV Semester, Paper – V

COURSE – 5: IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

HOURS : 60 (5X12)

Max. Marks: 100

Course Outcomes:

This course will provide students with a deep knowledge in immunology, genetics, embryology and ecology and by the completion of the course the graduate shall able to –

CO1 To get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.

CO2 To describe immunological response as to how it is triggered (antigens) and regulated (antibodies)

CO3 Understand the applications of Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.

CO4 Get familiar with the tools and techniques of animal biotechnology.

Learning Objectives

- To trace the history and development of immunology
- To provide students with a foundation in immunological processes
- To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses
- Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation
- To provide knowledge on animal cell and tissue culture and their preservation
- To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology and their application in medicine and industry for the benefit of living organisms
- To explain *in vitro* fertilization, embryo transfer technology and other reproduction manipulation methodologies.
- To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins.
- To understand principles of animal culture, media preparation.

Syllabus:

Unit – I Immunology – I (Overview of Immune system)

- 1.1 Introduction to basic concepts in Immunology
- 1.2 Innate and adaptive immunity, Vaccines and Immunization programme
- 1.3 Cells of immune system
- 1.4 Organs of immune system

Unit – II Immunology – II (Antigens, Antibodies, MHC and Hypersensitivity)

2.1 Antigens: Basic properties of antigens, B and T cell epitopes, haptens and adjuvants; Factors influencing immunogenicity

2.2 Antibodies: Structure of antibody, Classes and functions of antibodies

2.3 Structure and functions of major histo compatibility complexes

2.4 Exogenous and Endogenous pathways of antigen presentation and processing

2.5 Hypersensitivity – Classification and Types

Unit – III Techniques

3.1 Animal Cell, Tissue and Organ culture media: Natural and Synthetic media,

3.2 Cell cultures: Establishment of cell culture (primary culture, secondary culture, types of cell lines; Protocols for Primary Cell Culture); Established Cell lines (common examples such as MRC, HeLa, CHO, BHK, Vero); Organ culture; Cryopreservation of cultures

3.3 Stem cells: Types of stem cells and applications

3.4 Hybridoma Technology: Production & applications of Monoclonal antibodies (mAb)

Unit – IV Applications of Animal Biotechnology

4.1 Genetic Engineering: Basic concept, Vectors, Restriction Endonucleases and Recombinant DNA technology

4.2 Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery

4.3 Transgenic Animals: Strategies of Gene transfer; Transgenic - sheep, - fish; applications

4.4 Manipulation of reproduction in animals: Artificial Insemination, *In vitro* fertilization, super ovulation, Embryo transfer, Embryo cloning

Unit - V

5.1. PCR: Basics of PCR.

5.2 DNA Sequencing: Sanger's method of DNA sequencing- traditional and automated sequencing (2 hrs)

5.3 Hybridization techniques: Southern, Northern and Western blotting

5.4 DNA fingerprinting: Procedure and applications

5.5 Applications in Industry and Agriculture: Fermentation: Different

types of Fermentation and Downstream processing; Agriculture: Monoculture in fishes, polyploidy in fishes

Co-curricular activities (suggested)

- Organizing awareness on immunization importance in local village in association with NCC and NSS teams
- Charts on types of cells and organs of immune system
- Student study projects on aspects such as – identification of allergies among students (hypersensitivity), blood groups in the class (antigens and antibodies duly reported) etc., as per the creativity and vision of the lecturer and students
- Visit to research laboratory in any University as part of Zoological tour and exposure and/ or hands-on training on animal cell culture.
- Visit to biotechnological laboratory in University or any central/state institutes and create awareness on PCR, DNA finger printing and blot techniques or Visit to a fermentation industry or Visit to a local culture pond and submit report on culture of fishes etc.

REFERENCE BOOKS

1. Immunology by Ivan M. Riott
2. Immunology by Kubey
3. Sreekrishna V. 2005. *Biotechnology –I, Cell Biology and Genetics*. New Age International Publ. New Delhi, India.

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II B.Sc. Zoology, IV Semester, Practical - V, 2022- 2023

Periods: 24

Max. Marks: 50

Learning Objectives:

- Acquainting student with immunological techniques vis-à-vis theory taught in the class room
- Interconnect the theoretical and practical knowledge of immunity with the outer world for the development of a healthier life.
- Demonstrate basic laboratory skills necessary for Biotechnology research
- Promoting application of the lab techniques for taking up research in higher studies

I. IMMUNOLOGY

1. Demonstration of lymphoid organs (as per UGC guidelines)
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Blood group determination
4. Demonstration of
 - a. ELISA
 - b. Immunoelectrophoresis

II. Animal biotechnology

1. DNA quantification using DPA Method.
2. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting
3. Separation, Purification of biological compounds by paper, Thin-layer and Column chromatography
4. Cleaning and sterilization of glass and plastic wares for cell culture.
5. Preparation of culture media.

REFERENCE BOOKS

1. Immunology Lab Biology 477 Lab Manual; Spring 2016 Dr. Julie Jameson
2. Practical Immunology A Laboratory Manual; **LAP LAMBERT Academic Publishing**
3. Manual of laboratory experiments in cell biology by Edward, G
4. Laboratory Techniques by Plummer

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
III B.Sc, 2022- 2023
ZOOLOGY SYLLABUS
V Semester, Paper – VI
SUSTAINABLE AQUACULTURE MANAGEMENT

Learning Outcomes:

Students at the successful completion of this course will be able to

- Evaluate the present status of aquaculture at the Global level and National level
- Classify different types of ponds used in aquaculture
- Demonstrate induced breeding of carps
- Acquire critical knowledge on commercial importance of shrimps
- Identify fin and shell fish diseases

Syllabus:

Unit: 1

- 1.1 Present status of Aquaculture – Global and National scenario
- 1.2 Major cultivable species for aquaculture: freshwater, brackish water and marine.
- 1.3 Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp.
- 1.4 Design and construction of fish and shrimp farms

Unit: 2

- 2.1 Functional classification of ponds – head pond, hatchery, nursery ponds
- 2.2 Functional classification of ponds -rearing, production, stocking and quarantine ponds
- 2.3 Need of fertilizer and manure application in culture ponds
- 2.4 Physio-chemical conditions of soil and water optimum for culture (Temperature, depth, turbidity, light, water, PH, BOD, CO₂ and nutrients)

Unit: 3

- 3.1. Induced breeding in fishes
- 3.2. Culture of Indian major carps: Pre-stocking management (Dewatering, drying, ploughing/desilting; Predators, weeds and algal blooms and their control, Liming and fertilization)
- 3.3. Culture of Indian major carps - Stocking management
- 3.4. Culture of Indian major carps - post-stocking management

Unit: 4

- 4.1 Commercial importance of shrimp & prawn
- 4.2 *Macrobrachium rosenbergii*- biology, seed production.
- 4.3 Culture of *Litopenaeus vannamei* – hatchery technology and culture practices
- 4.4 Mixed culture of fish and prawns

Unit: 5

- 5.1 Viral diseases of Fin Fish & shell fish
- 5.2 Fungal diseases of Fin & Shell fish
- 5.3 Bacterial diseases of Finfish & Shell fish
- 5.4 Prophylaxis in aquaculture

Additional Input:

Spirulina

References:

1. Pillay TVR & M.A.Dill, 1979. Advances in Aquaculture. Fishing News Books Ltd., London
2. Stickney RR 1979. Principles of Warm Water Aquaculture. John Wiley & Sons Inc.1981
3. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company.
4. Bose AN et.al. 1991. Costal Aquaculture Engineering. Oxford & IBH Publishing Company Pvt. Ltd.

Web Links:

- 1.http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
2. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
3. <https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

CH.S.D.St. Theresa's Autonomous College for Women, Eluru

III B.Sc. Zoology, V Semester, Practical - VI, 2022- 2023

SUSTAINABLE AQUACULTURE MANAGEMENT PRACTICAL SYLLABUS

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- Identify the characters of Fresh water cultivable species
- Estimate physico chemical characteristics of water used for aquaculture
- Examine the diseases of fin and shell fish
- Suggest measures to prevent diseases in aquaculture

V. Practical (Laboratory) Syllabus:

1. Fresh water Cultivable species any (Fin & Shell Fish Specimens – Observation of morphological characters by observation and drawings)-5
2. Brackish water cultivable species (Fin & Shell fish- Specimens- Observation of Morphological Character by observing drawing) -5
3. Hands on training on the use of kits for determination of water quality in aquaculture (DO, Salinity, pH, Turbidity- Testing kits to be used for the estimation of various parameters/ Standard procedure can be demonstrated for the same)
4. Demonstration of Hypophysation (Procedure of hypophysation to be demonstrated in the practical lab with any edible fish as model)
5. Viral diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of viral pathogens in fin/ shell fish – one edible specimen can be used for observation of same in the laboratory)
6. Bacterial diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same in the laboratory)
7. Fungal diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same in the laboratory)

VI. Lab References

1. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company
2. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
3. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
4. <https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

Web resources suggested by the teacher concerned and the college librarian including reading material

VII. Co-Curricular Activities

a) Mandatory: (Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on Breeding- Induced breeding in carps -hatchery technology of *L. Vennami*- Farming techniques- disease diagnostic techniques—concepts –Demonstration @ any aqua laboratory
2. For Student: Students shall (individually) visit a Hatchery/Farm/ Aqua diagnostic center and make careful observations of the process method and implements- protocols and report on the same in 10 pages hand written Fieldwork/Project work Report.

3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.
5. (IE).Unit tests.

b) Suggested Co-Curricular Activities

1. Preparation of Model/Charts of Cultivable species of fin fish shell fish
2. Preparation of Model/Chart of Ideal fish Pond- with the standards prescribed.
3. Observation of aquaculture activities in their area (Observation of any activity related to aquaculture in the vicinity of the college/village)
4. Preparation of Model – charts of Fin /Shell fish Diseases with eco-friendly material.
5. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
III B.Sc, 2022-2023
ZOOLOGY SYLLABUS
V Semester, Paper – VII
POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES

Learning Outcomes:

Students at the successful completion of this course will be able to

- Identify the types of preservation methods employed in aquaculture
- Choose the suitable Processing methods in aquaculture
- Maintain the standard quality control protocols laid down in aqua industry
- Identify the best Seafood quality assurance system

Syllabus:

Unit – I Handling and Principles of fish Preservation

1. 1 Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and freshwater fish.
- 1.2 Principles of preservation – cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.

Unit – II Methods of fish Preservation

- 2.1 Traditional methods - sun drying, salt curing, pickling and smoking.
- 2.2. Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, irradiation and Accelerated Freeze drying (AFD).

Unit – III Processing and preservation of fish and fish by-products

- 3.1 Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.
- 3.2 Fish by-products – fish glue, Using glass, chitosan, pearl essence, shark fins, fish Leather and fish maws.

Unit – IV Sanitation and Quality control

- 4.1 Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.
- 4.2 Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.

Unit – V Quality Assurance, Management and Certification

- 5.1. Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety.
- 5.2 National and International standards – ISO 9000: 2000 Series of Quality Assurance System,

III. References:

1. Santharam R, N Sukumaran and P Natarajan 1987. A manual of aquaculture, Oxford- IBH, NewDelhi
2. Lakshmi Prasad's, Fish Processing Technology 2012, Arjun Publishing House
3. Dr Sunitha Rai, Fish Processing Technology, 2015, Random Publications

4. Safety and Quality Issues in Fish Processing (Woodhead Publishing Series in Food Science, Technology and Nutrition)by H A Bremner

5. K.A Mahanthy, Innovations in Fishing and Fish Processing Technologies, January 2021

Web Resources:

1. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=145743>

2. https://ecourses.icar.gov.in/e-Learningdownload3_new.aspx?Degree_Id=03

III B.Sc. Zoology, V Semester, Practical - VII, 2022- 2023

POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES PRACTICAL SYLLABUS

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- Identify the quality of aqua processed products.
- Determine the quality of fishery products by observation
- Analyze the protocols of aqua processing methods

V. Practical(Laboratory) Syllabus:

1. Evaluation of fish/ fishery products for organoleptic, chemical and microbial quality.
2. Preparation of dried, cured and fermented fish products
For detailed procedure method visit sites:
3. Examination of salt, protein, moisture in dried / cured products
4. Examination of spoilage of dried / cured fish products, marinades, pickles, sauce.
5. Preparation of isinglass, collagen and chitosan from shrimp and crab shell.
6. Developing flow charts and exercises in identification of hazards – preparation of hazard analysis worksheet
7. Corrective action procedures in processing of fish- flow chart- work sheet preparation
(* Refer the following web sites for complete procedure method and estimations of above listed practicals)

VI. References:

1. Dr Sunitha Rai, Fish Processing Technology, 2015, Random Publications
 2. https://ecourses.icar.gov.in/e-Learning/download3_new.aspx?Degree_Id=03
 3. <https://vikaspedia.in/agriculture/fisheries/post-harvest-and-marketing/processing-in-fisheries/fermented-products>
 4. <https://krishi.icar.gov.in/jspui/bitstream/123456789/20500/1/Fermentation%20technology%20of%20fish.pdf>
 5. <http://jebas.org/00200620122014/Abujam%20et%20al%20JEBAS.pdf>
 6. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf
 7. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf
 8. https://agritech.tnau.ac.in/fishery/fish_byproducts.html
 9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5352841/>
 10. <http://www.fao.org/3/i1136e/i1136e.pdf>
 11. <http://www.fao.org/3/x5989e/X5989e01.htm#What%20is%20sensory%20assessment>
- Web resources suggested by the teacher concerned and the college librarian including reading material

VII. Co-Curricular Activities

a) Mandatory: (Lab/field training of students by teacher (lab 10 + field 05):

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on various steps of post-harvest techniques of fishes, on the advanced techniques in post-harvest technology – Training of students on other employability skills in the Post-harvest sector of Aquaculture Industry- like Processing, Packing, marketing of processed aqua products.

2. For Student: Students shall (individually) visit - Any fish/shrimp Processing Plant/Packing industry and make observations on post harvesting techniques and submit a brief handwritten Fieldwork/Project work Report with pictures and data /survey in 10 pages.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements*
5. (IE): Unit tests,

b) Suggested Co-Curricular Activities

1. Observation of fish/shrimp processing plants – visit web sites of processing companies and record the details of that Unit
2. Interaction with local fishermen to know the method of preservation and details with the available traditional technology
3. Collection of web resources on the Quality assurance, quality control measures in Aqua Industries- cross checking the standards during the visit to any processing units.
4. Assignments, Seminar, Group discussion. Quiz, Collection of Material, Invited lecture, Video preparation etc.,

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
I B.Sc, 2022-2023
I B.Sc, II Semester
SKILL DEVELOPMENT COURSE
BIOLOGY STREAM

DAIRY TECHNOLOGY

Hours.30

Max. Marks.50

Learning Outcomes:

After successful completion of the course, students will be able to;

1. Understand the pre-requisites for starting a Dairy farm
2. Recognize different breeds of Cows & buffaloes following safety precautions.
3. Prepare and give recommended feed and water for livestock
4. Maintain health of livestock along with productivity
5. Vaccination of cattle, nutrients requirements
6. Entrepreneurship i.e., Effectively market dairy products
7. Ensure safe and clean dairy farm and Standard safety measures to be taken in establishing an industry
8. Efficiently start and manage to establish or develop a Dairy Industry

Section I (Introduction and Establishment of a Dairy Farm): 05 Hrs

- 1.1 Dairy development in India – Dairy Cooperatives (NDRI, NDDB, TCMPPF) (1hr)
- 1.2 Constraints of Present Dairy Farming and Future Scope of Dairy Farmer.(1 hr)
- 1.3 Selection of site for dairy farm; Systems of housing – Loose housing system, Conventional Dairy Farm; Records to be maintained in a dairy farm. (2 hrs)

Section II (Livestock Identification and Management): 13 Hrs

- 2.1 Breeds of Dairy Cattle and Buffaloes – Identification of Indian cattle and buffalo breeds and Exotic breeds; Methods of selection of Dairy animals. (5 hrs)
- 2.2 Systems of inbreeding and crossbreeding. (2 hrs)
- 2.3 Weaning of calf, Castration, Dehorning, Deworming and Vaccination programme (3 hrs)
- 2.4 Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks. (3 hrs)

Section III (Feed Management, Dairy Management, Cleaning and Sanitation): 8 Hrs

- 3.1 Basic Principles of Feed, Important Feed Ingredients, Feed formulation and Feed Mixing (2 hrs)
- 3.2 Operation Flood –Definition of Milk and Nutritive value of milk and ICMR recommendation of nutrients –Per Capita Milk production and availability in India and Andhra Pradesh -Methods of Collection and Storage of Milk–Labelling and Storage of milk products (4 hrs)
- 3.3 Cleaning and sanitation of dairy farm – Safety precautions to prevent accidents in an industry. (2 hrs)

Co-curricular Activities Suggested: (4 hrs)

1. Group discussion & SWOT analysis
2. Visit to a Dairy Farm
3. Visit to Milk Cooperative Societies
4. Visit to Feed Milling Plants
5. Market Study and Identification of Government Schemes, Insurance and Bank Loans in relation to dairy farming

Reference books:

1. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company
2. Principles and practices of Dairy Farm –Jagdish Prasad
3. Text book of Animal Husbandry - G C Benarjee
4. Hand book of Animal Husbandry - ICAR Edition
5. Outlines of Dairy Technology – Sukumar (De) – Oxford University press
6. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House.
7. The technology of milk Proceesing – Ananthkrishnan, C.P., Khan, A.Q. and Padmanabhan, P.N. – Shri Lakshmi Publications.
8. Dairy India 2007, Sixth edititon
9. Economics of Milk Production – Bharati Pratima Acharya Publishers.
10. <http://www.asci-india.com/BooksPDF/Dairy%20Farmer%20or%20Entrepreneur.pdf>
11. <https://labour.gov.in/industrial-safety-health>

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.
II B.Sc, 2022-2023
II B.Sc, III Semester
SKILL DEVELOPMENT COURSE
BIOLOGY STREAM ENVIRONMENTAL AUDIT

Learning Outcomes:

By successful completion of the course, students will be able to;

1. *Understand the basic concepts Environmental health*
2. *Learn and identify the industrial pollution*
3. *Explain the highlights in the regulatory aspects of Environmental law and policy*
4. *Understand the various phases of Environmental Audit*

UNIT – I

Industrial Pollution and its effects

Climate – Weather and Air Pollution – Classification of water and water bodies – Water Quality Parameters – Water Pollution – Sources – Classification, nature and Toxicology of water pollutants. - Soil parameters – Soil pollution and impacts – Soil conservation

UNIT - II

Environmental Law & Policy:

Highlights of the Acts, Institutional arrangements for: (1) The Water (Prevention & Control of Pollution) Act, 1974 amended in 1988; (2) The Air (Prevention and Control of Pollution) Act, 1981 amended in 1987; (3) The Water (Prevention and Control of Pollution) Cess Act, 1977 amended in 1991; (4) The Environment (Protection) Act, 1986; (5) The Public Liability Insurance Act, 1991; – Indian Policy Statement for abatement of Pollution, 1992.

UNIT - III

Environmental Audit - Scope & Requisites:

Environmental Audit: Definition; Objectives; Scope, Coverage - GOI Notification on Environmental Audit - Benefits to Industry. Reporting Environmental Audit Findings - Importance of Environmental Audit Report to industry, public and the governments.

Co-curricular Activities Suggested: 05h

1. Visit to understand Institutional arrangements and functioning of Pollution Control Boards.
2. Visiting different Ecosystems
3. **Soil analysis:** Determination of soil type and texture, pH, Soil Moisture, Nitrogen, Potassium and Phosphorous.
4. **Water analysis:** Determination of pH, Dissolved solids and suspended solids, Dissolved Oxygen, COD, BOD.
5. Assignments, Group discussion, Quiz etc.

MICROBIOLOGY SYLLABUS 2022-2023

PAPER TITLES

	Semester	Paper	Title of the Paper
I Year	I	Paper I	Introduction to Microbiology and Microbial Diversity
	II	Paper II	Enzymology and Microbial Physiology
II Year	III	Paper III	Molecular Biology and Microbial Genetics
	IV	Paper IV Paper V	Immunology & Medical Microbiology Microbial Ecology and industrial Microbiology
III Year	VI	Paper VI	Food Agriculture and Industrial microbiology
		Paper VII	Management of human microbial diseases and diagnosis
PROJECT WORK			

BSc	MICROBIOLOGY (Semester: I)	Credits: 4
MBT: I	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	Hrs/Wk: 4

Aim and objectives of Course

To understand History & Development of Microbiology, Microscopy, staining and sterilization techniques, Ultra-structure of cell, Different methods of microbial characterization

To study nature of viruses, viral classification, cultivation of viruses and Type study of TMV & HIV

Learning outcomes of Course

Up on completion of the course students able to

1. Explain relationship and apply appropriate terminology relating to the structure, Genetics, metabolism and ecology of prokaryotic microorganisms, Algae, viruses and Fungi.
2. Students will get basics and importance of Microbiology.
3. Demonstrate appropriate laboratory skill and techniques related to isolation, staining, identification and control of microorganisms.

UNIT-I:History of Microbiology & Place of Microorganisms in the living world

No. of hours: 12

History of Microbiology in the context of contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky, Martinus Beijerinck and Sergei Winogradsky

Importance and applications of microbiology

Place of Microorganisms in the Living World Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese

UNIT-II: Prokaryotic microorganisms and Viruses

No. of hours: 12

Ultra-structure of Prokaryotic cell- Cell Wall, Cell Membrane, Cytoplasm, Nucleoid, Plasmid, Inclusion Bodies, Flagella Pili, Capsule, Endospore

General characteristics of Bacteria (Size, shape, arrangement, reproduction)

General characteristics of Rickettsia, Mycoplasmas, Cyanobacteria, Archaea

General characteristics of viruses, Cultivation of Viruses (in brief)

Morphology, Structure and replication of TMV and Lambda Bacteriophage

UNIT-III: Eukaryotic microorganisms

No. of hours: 12

Fungi - Habitat, nutrition, vegetative structure and modes of reproduction; outline classification

Algae - Habitat, thallus organization, photosynthetic pigments, storage forms of food, reproduction.

Protozoa – Habitat, cell structure, nutrition, locomotion, excretion, reproduction, encystment, outline classification

UNIT-IV: Isolation and Culture of Bacteria and Fungi

No. of hours: 12

Growth media- Natural, synthetic and semi synthetic media. Selective, Enrichment, and Differential media

Pure culture techniques - dilution-plating, Streak-plate, Spread-plate, Pour-Plate and micromanipulator.

Preservation of microbial cultures - sub culturing, overlaying cultures with mineral oils, lyophilization, sand cultures, storage at low temperature.

UNIT-V: Principles of Microscopy, Sterilization and Disinfection

No. of hours: 12

Principles of microscopy - Bright field and Electron microscopy (SEM and TEM).

Staining Techniques - Simple and Differential staining techniques (Gram staining, Spore staining).

Sterilization and disinfection techniques –

Physical methods - autoclave, hot- air oven, pressure cooker, laminar air flow, filter sterilization, Radiation methods - UV rays, Gamma rays.

Chemical methods - alcohols, aldehydes, fumigants, phenols, halogens and hypochlorites.

MBP- I: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 30 CREDITS: 1

1. Microbiology Good Laboratory Practices and Biosafety.
2. Preparation of culture media for cultivation of bacteria- Nutrient broth & Nutrient agar
3. Preparation of culture media for cultivation of fungi – Sabourauds agar
4. Sterilization of medium using Autoclave
5. Sterilization of glassware using Hot Air Oven
6. Light compound microscope and its handling
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Algae and Fungi.
8. Simple staining
9. Gram's staining
10. Hanging-drop method & temporary wet mount (TWM) for observation of living microorganisms.
11. Isolation of pure cultures of bacteria by serial dilution and Streak/Spread/Pour Plate Method.
12. Preservation of bacterial cultures by Serial subculturing & Slant Preparation with mineral oil overlay.
13. Observation of electron micrographs of bacterial cells

Recommended Text Books & Reference books:

- Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). Microbiology. 5th Edition, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
- Dube, R.C. and Maheswari, D.K. (2000) General Microbiology. S Chand, New Delhi. Edition), Himalaya Publishing House, Mumbai.
- Power, C.B. and Dagainawala, H.F. (1986). General Microbiology Vol I & II
- Prescott, M.J., Harley, J.P. and Klein, D.A. (2012). Microbiology. 5th Edition, WCB McGrawHill, New York.
- Reddy, S.M. and Reddy, S.R. (1998). Microbiology Practical Manual, 3 rd Edition, Sri Padmavathi Publications, Hyderabad.
- Singh, R.P. (2007). General Microbiology. Kalyani Publishers, New Delhi.
- Stanier, R.Y., Adelberg, E.A. and Ingram, J.L. (1991). General Microbiology, 5th Ed., Prentice Hall of India Pvt. Ltd., New Delhi.
- Microbiology Edited by Prescott
- Jaya Babu (2006). Practical Manual on Microbial Metabolisms and General Microbiology. Kalyani Publishers, New Delhi.
- Gopal Reddy *et al.*, Laboratory Experiments in Microbiology

BSc	MICROBIOLOGY (Semester: II)	Credits: 4
MBT: II	ENZYMOLGY AND MICROBIAL PHYSIOLOGY	Hrs/Wk: 4

Aim and objectives of Course

To understand DNA, RNA, Protein structure and synthesis. DNA damage, mutations and repair. Gene transfer methods.

Learning outcomes of Course

1. This Course provides Understanding of biomolecular synthesis and control will help in further study
2. Develop knowledge on microbial genetics and molecular biology

UNIT-I: Enzymes

No. of hours: 12

Properties and classification of Enzymes.

Biocatalysis- induced fit and lock and key models.

Coenzymes and Cofactors.

Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric.

Factors effecting enzyme activity

UNIT-II

Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells. Nutritional groups of microorganisms- autotrophs, heterotrophs, mixotrophs. Growth media- synthetic, complex, selective, enrichment and differential media.

UNIT-III

Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous, biphasic growth. Factors influencing microbial growth. Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbidometry and biomass.

UNIT-IV

Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation.

UNIT-V

Anaerobic respiration (Nitrate). Fermentation - Alcohol and lactic acid fermentations. Outlines of oxygenic and anoxygenic photosynthesis in bacteria.

MBP – II: ENZYMOLOGY AND MICROBIAL PHYSIOLOGY

1. Preparation of different media- Synthetic and
2. Preparation of Complex Media
3. Setting and observation of Winogradsky column
4. Determination of viable count of bacteria
5. Bacterial growth curve
6. Factors affecting bacterial growth – pH
7. Factors affecting bacterial growth – Temperature
8. Factors affecting bacterial growth –Salts

Recommended Text Books &Reference books:

- Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman and Company Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. Brown Publications,Iowa, USA.
- Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry, 2nd Edition, CBS Publishers and Distributors, New Delhi.
- Sashidhara Rao, B. and Deshpande, V. (2007). Experimental Biochemistry: A student Companion. I.K. International Pvt. Ltd.
- Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H.Freeman
- Voet,D. and Voet J.G (2004) Biochemistry 3rd edition, John Wiley and Sons
- White, D. (1995). The Physiology and Biochemistry of Prokaryotes, Oxford UniversityPress, New York.

BSc	MICROBIOLOGY (Semester: III)	Credits: 4
MBT: III	MOLECULAR BIOLOGY AND MICROBIAL GENETICS	Hrs/Wk: 4

Aim and objectives of Course

To understand different biomolecules, analytical techniques, bacterial nutrition, growth and metabolism

Learning outcomes of Course

Up on completion of this course students should able to:

1. Explain working principle and applications of Colorimetry, Chromatography, Spectrophotometry, Centrifugation and Gel Electrophoresis.
2. Knowledge on Microbial nutrition, bacterial growth, metabolism and Respiration.
3. The student will get first-hand experience on separation methods

UNIT- I: Nucleic acids

No. of hours: 12

DNA and RNA - Role in heredity-The central dogma
Watson and Crick model of DNA
Types of RNA, structure, and functions
Organization of DNA in prokaryotes

UNIT- II :Genetic material and replication

No. of hours: 12

Experiments which established DNA as genetic material
RNA as genetic material
Mechanism of DNA Replication in Prokaryotes
Proof of semi conservative mechanism of replication (Meselson - Stahl Experiment)

UNIT- III: Gene expression and regulation

No. of hours: 12

Concept of gene - Muton, recon and cistron.
Genetic code
Protein synthesis - Transcription and translation in Prokaryotes
Regulation of gene expression in bacteria -*lac* operon

UNIT- IV: Mutations, damage and repair

No. of hours: 12

Outlines of DNA damage and repair mechanism
Mutations - spontaneous and induced
Chromosomal aberrations - deletions, inversions, tandem duplications, insertions
Point mutations- base pair changes, frame shifts
Mutagens - Physical and Chemical mutagens
Bacterial recombination-Transformation, Conjugation, Transduction (Generalized and specialized transductions)

UNIT- V: Genetic engineering

No. of hours: 12

Basic principles of genetic engineering.

Restriction endonucleases, DNA ligases.
Vectors – plasmids (pBR322), Cosmids, Phagemids, lambda phage vector, M 13 vectors.
Outlines of gene cloning methods.
Polymerase chain reaction.
Genomic and cDNA libraries.
General account on application of genetic engineering in industry, agriculture, and medicine.

MBP – III: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

TOTAL HOURS: 30

CREDITS: 1

1. Study of different types of DNA and RNA using micrographs and model / schematic representations.
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of DNA using UV spectrophotometer.
5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS - PAGE).
7. Problems related to DNA and RNA characteristics, Transcription and Translation.
8. Induction of mutations in bacteria by UV light.
9. Instrumentation in molecular biology - Ultra centrifuge, Transilluminator, PCR

Recommended Text Books & Reference books:

- Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi.
- Freifelder, D. (1997). Essentials of Molecular Biology. Narosa Publishing House, New Delhi.
- Glick, B.P. and Pasternack, J. (1998). Molecular Biotechnology, ASM Press, Washington D.C., USA.
- Lewin, B. (2000). Genes VIII. Oxford University Press, England.
- Maloy, S.R., Cronan, J.E. and Freifelder, D. (1994). Microbial Genetics, Jones and Bartlett Publishers, London.
- Ram Reddy, S., Venkateswarlu, K. and Krishna Reddy, V. (2007) A text Book of Molecular Biotechnology. Himalaya Publishers, Hyderabad.
- Sinnot E.W., L.C. Dunn and T. Dobzhansky. (1958). Principles of Genetics. 5 th Edition. McGraw Hill, New York.
- Smith, J.E. (1996). Biotechnology, Cambridge University Press.
- Snyder, L. and Champness, W. (1997). Molecular Genetics of Bacteria. ASM press,
- Strickberger, M.W. (1967). Genetics. Oxford & IBH, New Delhi.
- Verma, P.S. and Agarwal, V.K. (2004). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co. Ltd., New Delhi.

BSc	MICROBIOLOGY (Semester: IV)	Credits: 4
MBT: IV	IMMUNOLOGY AND MEDICAL MICROBIOLOGY	Hrs/Wk: 4

Aim and objectives of Course

To study types of immunity, immune organs, cells, antibodies and antigen-antibody interactions.

To learn diagnostic and pathogenesis of various diseases. Antimicrobial defense and different toxins and vaccines.

Learning outcomes of Course

Up on completion of the course students able to

1. Explain Non-specific body defence and the immune response
2. Develop knowledge on disease transmission and control
3. Demonstrate on collection and handling of laboratory specimens
4. Develop an information making personal health decision in regard to infectious diseases.
5. Student can safeguard himself & society and can work diagnostics and hospitals.

UNIT-I: Immune System No. of hours: 12

Concept of Innate and Adaptive immunity

Primary and secondary organs of immune system - thymus, bursa fabricus, bone marrow, spleen, lymph nodes.

Cells of immune system- Identification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils

Complement system (in brief)

UNIT-II : Immune response No. of hours: 12

Characteristics of antigen (Foreignness, Molecular size, Heterogeneity and solubility)
Haptens.

Antibodies - basic structure and types and functions (Immune complex formation and elimination - Agglutination, Precipitation, Neutralization, Complement fixation, Phagocytosis)

Generation of Humoral Immune Response (Plasma and Memory cells)

Generation of Cell Mediated Immune Response

MHC- Functions of MHC I & II molecules

Hypersensitivity- definition and types (in brief)

Autoimmunity (in brief)

UNIT- III: Microbes in Health and Disease

No. of hours: 12

Normal flora of human body.

Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Opportunistic infections, Nosocomial infections.
 General account on microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention, and control of the following
 Bacterial diseases - Tuberculosis, Typhoid.
 Fungal diseases - Candidiasis.
 Protozoal diseases - Malaria.
 Viral Diseases – Corona virus and AIDS

UNIT- IV: Principles of Diagnosis **No. of hours: 12**

General principles of diagnostic microbiology- Collection, transport of clinical samples
 Identification by Culturing&Biochemical characteristics (IMViC)
 Identification by molecular assays (PCR, RT-PCR, DNA probes)
 Identification by serological tests (ELISA, Immunofluorescence, Agglutination based tests, Complement fixation)

UNIT- V: Prevention and Treatment **No. of hours: 12**

Vaccines
 Monoclonal antibodies- Production and application
 Antimicrobial agents- General modes of action of antibacterial (Penicillin), antifungal (Amphotericin), antiviral (Amantadine) agents
 Interferons
 Tests for antimicrobial susceptibility (Disc diffusion)
 Antibiotic resistance in bacteria

MBP -V: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 30 CREDITS: 1

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Immunodiffusion by Ouchterlony method.
4. Identification of any of the bacteria (*E. coli*, *Pseudomonas*, *Staphylococcus*, *Bacillus*) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, urease production and catalase tests
5. Study of composition and use of important differential media for identification of bacteria: EMB Agar, McConkey agar, Mannitol salt agar
6. Antibacterial sensitivity by Kirby-Bauer method
6. Determination of Minimal Inhibitory Concentration (MIC) of an antibiotic
7. Study symptoms of the diseases with the help of photographs: Anthrax, Polio, Herpes, chicken pox, HPV warts, Dermatmycoses (ring worms)
8. Study of various stages of malarial parasite in RBCs using permanent mounts.
9. Phenol coefficient test
10. Isolation of Normal flora of human body (Hands, Feet, Nostrils, Teeth Surface) by swab method.

11. Evaluation of Hand Sanitizer Effectiveness by Filter Paper Disc Method & thumb impression method.

Recommended Text Books & Reference books:

- Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication.
- Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.
- Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology. 11th edition Wiley-Blackwell Scientific Publication, Oxford.
- Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
- Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
- Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Microbiology. 4th edition. Elsevier Publication.
- Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education.

BSc	MICROBIOLOGY (Semester: IV)	Credits: 4
MBT: V	MICROBIAL ECOLOGY AND INDUSTRIAL MICROBIOLOGY	Hrs/Wk: 4

Aim and objectives of Course

- To study role of microorganisms in nutrient cycling, microorganism in waste treatment and degradation of xenobiotics
- To determine the potability of drinking water
- To study concepts of screening and strain improvement, media, Fermentation, assays with examples of industrially important processes

Learning outcomes of Course

Up on completion of the course students able to

1. Understand fundamental concept in soil microbial diversity, basic concept of biogeochemical cycles and plant growth promotion and plant diseases
2. Understands the role of microorganisms in treatment of solid and liquid waste.
3. Acquire knowledge on application of microorganisms in agro – environmental fields.
4. Get basic information design of fermenter, fermentation processes and Single cell proteins.
5. Self-reliance in the industrial application of Microbiology in life and industry.
6. Entrepreneurship can be established with the gained knowledge.

UNIT - I: Microbial Ecology

No. of hours: 12

Role of microorganisms in Biogeochemical cycles (Carbon, nitrogen, phosphorus)
 Microbe-microbe interactions - Synergism, mutualism, commensalism, antagonism, competition, parasitism, predation
 Plant- Microbe interactions - Plant growth promoting Microorganisms, Plant pathogens

UNIT -II: Microorganisms in Environment

No. of hours: 12

Microbes in waste management- solid and liquid waste (aerobic and anaerobic)
 Microbes in degradation of Xenobiotics
 Microbes in drinking water- detection of potability by (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique
 Microbes in food - intrinsic and extrinsic parameters that affect microbial growth in food

UNIT - III: Industrial Microbiology No. of hours: 12

Industrial important Microorganisms-
 Yeasts & Moulds , Bacteria , Actinomycetes .
 Screening techniques.
 Strain improvement techniques.

UNIT -IV: Fermentation processes

No. of hours: 12

Design of fermenter (for control of pH, temperature, dissolved oxygen, foaming and aeration)
 Types of fermentation processes - solid state, liquid state, batch, fed-batch, continuous.
 Fermentation media (Carbon source, nitrogen source, minerals, vitamins & growth factors, Buffers, Precursors, Antifoam agents, water, oxygen)
 Examples of Crude media; molasses, corn- steep liquor, sulphite waste liquor, whey.

Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.

UNIT - V: Microbial Productions

No. of hours: 12

Microbial production of Industrial products: Citric acid, Ethanol, Penicillin, Glutamic acid, vitamin B12, Amylase, Yogurt

Microbial cells as food- SCP

MBP - V: MICROBIAL ECOLOGY AND INDUSTRIAL MICROBIOLOGY

Total hours: 30

Credits: 1

1. Microbial fermentation for the production and estimation of ethanol
2. Isolation of amylase producing microorganisms from soil
3. Isolation of food spoilage microorganisms from spoiled food sample.
4. MPN test
5. Demonstration of fermenter
6. Production of wine from grapes
7. Growth curve and kinetics of any two industrially important microorganisms.
8. Microbial fermentation for the production and estimation of citric acid
9. Preparation of yoghurt.
10. Crowded plate technique
11. Isolation of microorganism from soil
12. Isolation of microorganism from different water samples

Recommended Text Books & Reference books:

- Atlas RM and Bartha R. (2000). **Microbial Ecology: Fundamentals & Applications**. 4th edition. Benjamin/Cummings Science Publishing, USA
- Barton LL & Northup DE (2011). **Microbial Ecology**. 1st edition, Wiley Blackwell, USA
- Campbell RE. (1983). **Microbial Ecology**. Blackwell Scientific Publication, Oxford, England.
- Coyne MS. (2001). **Soil Microbiology: An Exploratory Approach**. Delmar Thomson Learning.
- Lynch JM & Hobbie JE. (1988). **Microorganisms in Action: Concepts & Application in Microbial Ecology**. Blackwell Scientific Publication, U.K.
- Madigan MT, Martinko JM and Parker J. (2014). **Brock Biology of Microorganisms**. 14th edition. Pearson/ Benjamin Cummings
- Maier RM, Pepper IL and Gerba CP. (2009). **Environmental Microbiology**. 2nd edition, Academic Press
- Martin A. (1977). **An Introduction to Soil Microbiology**. 2nd edition. John Wiley & Sons Inc. New York & London. Adams MR and Moss MO. (1995). **Food Microbiology**. 4th edition, New Age International (P) Limited Publishers, New Delhi, India.
- Banwart JM. (1987). **Basic Food Microbiology**. 1st edition. CBS Publishers and Distributors, Delhi, India.
- Casida LE. (1991). **Industrial Microbiology**. 1st edition. Wiley Eastern Limited.
- Crueger W and Crueger A. (2000). **Biotechnology: A textbook of Industrial Microbiology**. 2nd Edition. Panima Publishing Company, New Delhi
- Frazier WC and Westhoff DC. (1992). **Food Microbiology**. 3rd edition. Tata McGraw-Hill Publishing Company Ltd, New Delhi, India.

BSc	MICROBIOLOGY (Semester: V)	Credits: 4
MBT: VI	FOOD, AGRICULTURE AND ENVIRONMENTAL MICROBIOLOGY	Hrs/Wk: 4

UNIT – 1

No.of Hours:8

Intrinsic and extrinsic parameters that affect microbial growth in food

Microbial spoilage of food - fruits, vegetables, milk, meat, egg, bread and canned foods

Food intoxication (botulism).

Food-borne diseases (salmonellosis) and their detection.

UNIT – II

No.of Hours:8

Principles of food preservation - Physical and chemical methods.

Fermented Dairy foods – cheese and yogurt.

Microorganisms as food – SCP, edible mushrooms (white button, oyster and paddy straw). Probiotics and their benefits.

UNIT – III

No.of Hours:8

Soil Microbiology: Microbial groups in soil, microbial transformations of carbon, nitrogen, phosphorus and sulphur, Biological nitrogen fixation. Microflora of Rhizosphere and Phyllosphere microflora, microbes in composting. Importance of mycorrhizal inoculums, types of mycorrhizae associated plants, mass inoculums. Production of VAM, field applications of Ectomycorrhizae and VAM.

UNIT - IV

No.of Hours:8

Beneficial microorganisms in Agriculture: Biofertilizer (Bacterial Cyanobacterial and Fungal), microbial insecticides, Microbial agents for control of Plant diseases, Biodegradation, Biogas production, Biodegradable plastics, Plant – Microbe interactions.

Diseases caused by bacteria and fungi to various commercial and food crops (2 examples each)

Management of soil biota for maintaining soil fertility. Conversion of waste lands into fertile lands.

Management of soil nutrients.

UNIT – V**No.of Hours: 12**

Terrestrial Environment: Soil profile and soil microflora. Aquatic Environment: Microflora of fresh water and marine habitats. Atmosphere: Aeromicroflora and dispersal of microbes. Extremophiles. Nutrient cycling - Carbon, nitrogen, phosphorus. Methods to detect portability of water samples.

Outlines of Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal

(composting and sanitary landfill).

Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary and tertiary sewage treatment.

MBP VI – FOOD, AGRICULTURE AND ENVIRONMENTAL MICROBIOLOGY

Total hours: 40

Credits: 2

1. Isolation of bacteria and fungi spoiled bread / fruits / vegetables
2. Preparation of yogurt / dahi
3. Determination of microbiological quality of milk sample by MBRT
4. Enumeration of bacteria, fungi and actinomycetes from soil
5. Enumeration and identification of rhizosphere micro flora
6. Isolation of rhizobium from root nodules.
7. Isolation of azatobcter from soil.
8. Observation description of any three bacterial and fungal plant diseases
9. Staining and observation of VAM.
10. Analysis of soil - pH, Moisture content and water holding capacity.
11. Study of air flora by petriplate exposure method.
12. Analysis of potable water: SPC, Presumptive, confirmed and completed test, determination of coli form count in water by MPN.
13. Determination of Biological Oxygen Demand (BOD) of waste water samples.

SUGGESTED READINGS:

- Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition, Benjamin/Cummings Science Publishing, USA
- Barton LL & Northup DE (2011). Microbial Ecology. 1st edition, Wiley Blackwell, USA
- Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
- Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.

- Lynch JM & Hobbie JE. (1988). *Microorganisms in Action: Concepts & Application in Microbial Ecology*. Blackwell Scientific Publication, U.K.
- Madigan MT, Martinko JM and Parker J. (2014). *Brock Biology of Microorganisms*. 14th edition. Pearson/ Benjamin Cummings.
- Maier RM, Pepper IL and Gerba CP. (2009). *Environmental Microbiology*. 2nd edition, Academic Press.
- Martin A. (1977). *An Introduction to Soil Microbiology*. 2nd edition. John Wiley & Sons Inc. New York & London.
- Okafor, N (2011). *Environmental Microbiology of Aquatic & Waste systems*. 1st edition, Springer, New York.
- Singh A, Kuhad, RC & Ward OP (2009). *Advances in Applied Bioremediation*. Volume 17, Springer-Verlag, Berlin Hedeilberg
- Stolp H. (1988). *Microbial Ecology: Organisms Habitats Activities*. Cambridge University Press, Cambridge, England.
- Subba Rao NS. (1999). *Soil Microbiology*. 4th edition. Oxford & IBH Publishing Co. New Delhi.
- Willey JM, Sherwood LM, and Woolverton CJ. (2013). *Prescott's Microbiology*. 9th edition. McGraw Hill Higher Education.

BSc	MICROBIOLOGY (Semester: V)	Credits: 4
MBT: VII	MANAGEMENT OF HUMAN MICROBIAL DISEASES AND DIAGNOSIS	Hrs/Wk: 4

UNIT – I

No.of Hours:8

Definition and concept of health, disease, infection, and pathogen. Bacterial, Viral, Fungal and Protozoan Diseases of various human body systems. Disease associated clinical samples for diagnosis - any three diseases of each.

UNIT- II No. of hours: 8

General account of epidemiology: principles of epidemiology, current epidemics (AIDS, nosocomial, acute respiratory syndromes). Collection of clinical samples (oral cavity, throat, skin, blood, CSF, urine and faeces) and precautions required.

Method of transport of clinical samples to laboratory and storage.

UNIT- III No. of hours:8

Mechanism of bacterial pathogenicity, colonization and growth, virulence, virulence factors, exotoxins, enterotoxins, endotoxins and neurotoxins.

Examination of sample by staining - Gram stain, Ziehl-Neelson staining for tuberculosis,

Giemsa-stained thin blood film for malaria.

Preparation and use of culture media - Blood agar, Chocolate agar, Lowenstein-Jensen medium, MacConkey agar, Distinct colony properties of various bacterial pathogens.

UNIT- IV

No. of hours:6

Serological Methods - Agglutination, ELISA, immunofluorescence, Nucleic acid based methods - PCR, Nucleic acid probes.

Diagnosis of Typhoid, Dengue and HIV, Swine flu. Role of vectors- biology of vectors. (1) House fly (2) Mosquitoes (3) sand fly.

UNIT- V

No. of hours:6

Importance, Determination of resistance/sensitivity of bacteria using disc diffusion method, Determination of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method. Epidemiological investigations to identify a disease, Problems of drug resistance and drug sensitivity. Drug resistance in bacteria.

MBP- VII: MICROBIAL DIAGNOSIS IN HEALTH CLINICS

TOTAL HOURS: 40

CREDITS: 2

1. Collection transport and processing of clinical specimens (Blood, Urine, Stool and Sputum).
Receipts, Labeling, recording and dispatching clinical specimens.
2. Physical, Chemical & microscopic examination of clinical samples – urine, stool, puss, sputum.
3. Isolation and identification of following pathogens from clinical samples: *E.coli*, *Salmonella* and *Pseudomonas*.
4. Demonstration of permanent slides of the following parasites:
 - a) *Entamoeba histolytica*
 - b) *Ascaris spp.*
 - c) *Plasmodium spp.*
 - d) *Mycobacterium tuberculosis* & *Mycobacterium leprae*
5. Estimation of hemoglobin (Acid hematin and cyan methanoglobin method).
6. ESR and PCV determination.
7. Immuno hematology: Blood group typing by slide test & tube for ABO & Rh systems.
8. Isolation of bacteria in pure culture and Antibiotic sensitivity.

SUGGESTED READING

- Ananthanarayan R and Paniker CKJ (2009) Textbook of Microbiology, 8th edition, Universities Press Private Ltd.
- Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.

- Collee JG, Fraser, AG, Marmion, BP, Simmons A (2007) Mackie and McCartney Practical Medical Microbiology, 14th edition, Elsevier.
- Randhawa, VS, Mehta G and Sharma KB (2009) Practicals and Viva in Medical Microbiology 2nd edition, Elsevier India Pvt Ltd.
- Tille P (2013) Bailey's and Scott's Diagnostic Microbiology, 13th edition, Mosby.

BIOCHEMISTRY SYLLABUS

2022-2023

Semester	Course No	Course Name
I	BCH-1	Biomolecules
		Biomolecules Lab
II	BCH-II	Analytical Techniques
		Analytical Techniques Lab
III	BCH-III	Enzymology, Bioenergetics and Intermediary Metabolism
		Enzymology, Bioenergetics and Intermediary Metabolism Lab
IV	BCH-IV	Physiology, Nutritional and Clinical Biochemistry
		Physiology Nutritional and Clinical Biochemistry Lab
	BCH-V	Microbiology, Immunology and Molecular Biology
		Microbiology, Immunology and Molecular Biology Lab
V		Genetic Engineering
		Advances in Biochemistry

1. Aim and objectives of UG program in Subject:

Biochemistry combines biology and chemistry to study living matter. It powers scientific and medical discovery in fields such as pharmaceuticals, forensics and nutrition. Biochemistry will enable to study chemical reactions at a molecular level for better understanding the concept in order to work in different institutes as well as to pursue research

2. Learning outcomes of Subject:

- The learning outcomes are designed to help learners understand the objectives of
- studying B.Sc. Biochemistry that is, to analyse, appreciate, understand the
- concepts of chemical reactions that occur in living systems, which enable them to understand the various perspectives of applied sciences that benefit the mankind
-
- Acquire knowledge and understanding of the principles that govern the structures of macromolecules and their participation in molecular recognition;
- Enrich with principles and basic mechanisms of metabolic control and molecular signaling
- Use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments;
- Implemental protocols, and adapt them to plan and carry out simple investigations
- Analyze, interpret, and participate in reporting to their peers on the results of their laboratory experiments;
- Participate in and report orally on team work investigations of problem-based assignments and viva presentations.

B.Sc.	BIOCHEMISTRY (Semester - I)	Credits: 4+1
Paper: 1	Biomolecules	Hrs/Wk: 4+2(T+L)

Aim and objectives of Course (Biomolecules):

- The student gains knowledge in the chemistry of biomolecules such as water, carbohydrates, lipids, proteins and nucleic acids which make up all the living organisms including humans.
- **Learning outcomes of Course**
- Students will understand the importance of biomolecules in living organisms and effects of their alterations in diseases occurring in plants, animals and humans.
- The practical will give the expertise to the student for analysis of any biological or non-biological sample for identification of its chemical composition.
- Understand that biological macromolecules like cellulose, proteins and DNA are polymers made of monomers with distinct chemical properties describe the ring forms of α -glucose and β -glucose
- Students will demonstrate ability to evaluate the impact of structure/part modification on a biological system and/or relationships between systems.

Unit - I: Carbohydrates:

12 hours

Carbohydrates: Classification, monosaccharides, D and L designation, open chain and cyclic structures, epimers and anomers, mutarotation, reactions of carbohydrates (due to functional groups - hydroxyl, aldehyde and ketone. Amino sugars, Glycosides. Structure and biological importance of disaccharides (sucrose, lactose, maltose, isomaltose, trehalose), tri-saccharides (raffinose, melezitose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen). Glycosaminoglycans, Bacterial cell wall polysaccharides. Outlines of glycoproteins, glycolipids and blood group substances.

Unit – II: Lipids:

12 hours

Lipids: Classification, saturated and unsaturated fatty acids, structure and properties of fats and oils (acid, saponification and iodine values, rancidity). General properties and structures of phospholipids. Prostaglandins- structure, types and biological role. Lipoproteins- types and functions, Bio-membranes-formation of micelles, bilayers, vesicles, liposomes. Membrane composition and organization - Fluid mosaic mode

Unit-III: Amino Acids 12 hours

Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to carbonyl and amino groups. Titration curve of glycine and pK values. Essential and non-essential amino acids, non-protein amino acids. Peptide bond - Nature and conformation. Naturally occurring peptides - glutathione, enkephalin.

Unit-IV: Proteins:

12 hours

Proteins Classification based on solubility, shape and function. Determination of amino acid composition of proteins. General properties of proteins, denaturation and renaturation of proteins. Structural organization of proteins- primary, secondary, tertiary and quaternary structures (Eg. Hemoglobin and Myoglobin).

Unit-V: Nucleic acids and porphyrins:

12 hours

Types of RNA and DNA. Structure of purines and pyrimidines, nucleosides, nucleotides. Stability and formation of phosphodiester linkages. Effect of acids, alkali and nucleases on DNA and RNA. Structure of Nucleic acids- Watson-Crick DNA double helix structure, denaturation and renaturation kinetics of nucleic acids-, T_m values and their significance, cot curves and their significance.

Structure of porphyrins: Identification of Porphyrins, Protoporphyrin, porphobilinogen properties, Structure of metallo-porphyrins–Heme, cytochromes and chlorophylls.

List of practical Experiments:

1. Qualitative identification of carbohydrates- glucose, fructose, ribose/xylose, maltose, sucrose, lactose, starch/glycogen.
2. Qualitative identification of amino acids-histidine, tyrosine, tryptophan, cysteine, arginine.
3. Qualitative identification of lipids- solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
4. Preparation of Osazones and their identification.
5. Absorption maxima of colored substances-p-Nitrophenol, Methyl orange.

Recommended books:

1. The biochemistry of Nucleic acids; Adams et al., Chapman and Hall, 1986.
2. Proteins: A guide to study by physical & chemical methods, Haschemeyer and Haschemeyer,
3. Proteins: Structure, function and evolution. Dickerson & Geis, 2nd Edn, Benjamin/Cummings.
4. Biochemistry - Zubay C, Addison – Wesley, 1986.
5. Biochemistry, A problem Approach, 2nd Edn. Wood, W.B. Addison Wesley 1981.
6. Biochemistry, Lehninger A.H.
7. Textbook of Biochemistry West, E.S., Todd, Mason & Vanbruggen, Macmillian&Co.
8. Principles of Biochemistry White-A, Handler, Pand Smith E.L. Mc Grew Hill.
9. Organic chemistry, I.L. Finar, ELBS. (1985).
10. Organic Chemistry by Morrison and Boyd (2000) Prentice Hall.
11. Fundamentals of Biochemistry by Donald Voet (1999).

B.Sc.	BIOCHEMISTRY (Semester - II)	Credits: 4+1
Paper-2	Analytical Techniques	Hrs/Wk: 4+2 (T+L)

Aim and objectives of Course: Analytical Techniques

The knowledge in the analytical techniques will enable the student for isolation, purification and chemical characterization of compounds from plants and microbes which will have medical or commercial importance.

Learning outcomes of course

- Develop competence in handling various chromatographic techniques and apply them
- in isolating and characterizing different biological molecules. Understanding the applications of centrifugation and chromatography in biological
- Will gain an ideology on how to Purify proteins by affinity chromatography using epitope tags such as histidine tag,
- Understanding the principles of Electrophoresis, Spectrophotometry and ELISA and
- their applications in biological investigations/experiments.
- biochemistry like electrophoresis, chromatography, etc. Gain expertise in the isolation of biomolecules
- Students will learn facts about major classes of instruments commonly used in chemical analysis. Their knowledge will be captured by the ability to block diagram these complex pieces of equipment, and tailor the specifications to the measurement needs.
- Analysts will develop the ability to apply calibration curves, internal standards and the method of standard addition as needed for various measurement problems.
- Can Use sample data obtained from spectrochemical techniques to calculate unknown concentrations or obtain structural information where applicable.
- Able to describe the various chromatographies described within this course and analyze a given chromatogram

Unit - I: Biophysical Concepts & Cell disruption methods

12 hours

Water as biological solvent, Buffers, measurement of pH, electrodes, Biological relevance of pH, pKa value, Electrical conductivity, analysis of drinking water and

pond water, Total dissolved salts (TDS), BOD, COD, soil analysis (texture, organic matter, elements), Methods of tissue homogenization: (Potter-Elvehjem, mechanical blender, sonicator and enzymatic).

Unit – II: Microscopy and Centrifugation

12 hours

Microscopy: Basic principles of light microscopy, phase contrast, electron microscope and fluorescent microscope and their applications. Centrifugation techniques, principles and applications- differential, density gradient. Ultra-centrifugation- preparative and analytical

Unit-III: Chromatographic techniques

12 hours

Chromatography - Principle and applications, Types of chromatographic techniques - Paper chromatography- solvents, R_f value, applications; Thin layer chromatography- principle, choice of adsorbent and solvent, R_f value, applications; Gel filtration, Ion-exchange- principle, resins, action of resins, experimental techniques, applications, separation of metal ions; Affinity chromatography.

Unit-IV: Spectroscopy and tracer techniques

12 hours

Electromagnetic radiation, Beer-Lambert's law.

Colorimetry and Spectrophotometry, spectrofluorimetry, flame photometry. Tracer techniques: Radio isotopes, units of radio activity, half-life, β and γ - emitters, use of radioactive isotopes in biology, ELISA.

Unit-V: Electrophoresis

12 hours

Electrophoresis- principles and applications of paper, polyacrylamide (native and SDS) and agarose gel electrophoresis, isoelectric focusing, immune-electrophoresis- types and applications.

B.Sc.	BIO-CHEMISTRY (Semester - III)	Credits: 4+1
Paper: 3	Enzymology, Bioenergetics and Intermediary Metabolism	Hrs/Wk: 4+2 (T+L)

Aim and objectives of Course (Enzymology, Bioenergetics and Intermediary Metabolism):

The student will get knowledge in enzymes, their physiological importance and other applications. They also understand the metabolism of biomolecules like carbohydrate, lipid and aminoacids.

Learning outcomes of Course

- To understand the importance of lipids as storage molecules and as structural Component of biomembranes.
- Understanding the importance of high energy compounds, electron transport chain, Synthesis of ATP under aerobic and anaerobic conditions.
- To acquire knowledge related to the role of TCA cycle in central carbon metabolism, Importance of anaplerotic reactions and redox balance.
- To acquire fundamental knowledge on enzymes and their importance in biological Reactions.
- To understand ability to difference between a chemical catalyst and biocatalyst. Exposure to the concept of activation energy and its importance in biological Reactions.
- Exposure nature of non-protein enzymes such as ribozymes. Understanding the role of enzymesin clinical diagnosis and industries.

Unit-I: Enzymology 12 hours

Introduction to Biocatalysis, differences between chemical and biological catalysis. Nomenclature and classification of enzymes. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Active site, Enzyme specificity. Principles of energy of activation, transition state. Interaction between enzyme and substrate-lock and key,

induced fit models. Fundamentals of enzyme assay, enzyme units. Outlines of mechanism of enzyme action, factors affecting enzyme activity. Commercial application of enzymes.

Unit- II: Bioenergetics and Biological oxidation 12 hours

Bioenergetics: Thermodynamic principles – Chemical equilibria; free energy, enthalpy (H), entropy (S). Free energy change in biological transformations in living systems; High energy compounds. Energy, change, oxidation-reduction reactions.

Organization of electron carriers and enzymes in mitochondria. Classes of electron-transferring enzymes, inhibitors of electron transport. Oxidative phosphorylation. Uncouplers and inhibitors of oxidative phosphorylation. Mechanism of oxidative phosphorylation.

Unit-III: Carbohydrate Metabolism. 12 hours

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate-formation of lactate and ethanol, Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosynthesis- Light and Dark reactions, Calvin cycle, C4 Pathway. Disorders of carbohydrate metabolism- Diabetes Mellitus.

Unit-IV: Lipid Metabolism 12 hours

Catabolism of fatty acids (β - oxidation) with even and odd number of carbon atoms, Ketogenesis, de novo synthesis of fatty acids, elongation of fatty acids in mitochondria and microsomes, Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol. Disorders of lipid metabolism.

Unit-V: Metabolism of Amino acids 12 hours

General reactions of amino acid metabolism- transamination, decarboxylation and deamination, Urea cycle and regulation, Catabolism of carbon skeleton of amino acids- glycolytic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acid metabolism.

List of practical Experiments:

1. Assay of amylase.
2. Assay of urease.
3. Assay of catalase
4. Effect of pH, temperature and substrate concentration on enzyme activity.
5. Estimation of glucose by DNS method.
6. Estimation of glucose by Benedict's titrimetric method.
7. Estimation of total carbohydrates by Anthrone method.
8. Tests for lipids- Salkowski test, Lieberman-Burchard test.
9. Estimation of amino acid by Ninhydrin method.
10. Estimation of protein by Biuret method.
11. Recommended Co-curricular activities: (Co-curricular Activities should not promote copying from text book or from others' work and shall encourage self/independent and group learning)

Recommended books:

1. Understanding enzymes: Palmer T., Ellis Harwood Ltd., 2001.
2. Enzyme structure and mechanism. Alan Fersht, Freeman & Co. 1997
3. Principles of enzymology for food sciences: Whitaker Marc Dekker 1972.
4. Principles of Biochemistry, White. A, Handler, P and Smith.
5. Biochemistry, Lehninger A.L.
6. Biochemistry, LubertStryer.
7. Review of physiological chemistry, Harold A. Harper.
8. Text of Biochemistry, West and Todd.
9. Metabolic pathways – Greenberg.
10. Mitochondria, Munn.
11. Biochemistry, 2nd Edition, G. Zubay.

B.Sc.	BIO-CHEMISTRY (Semester - IV)	Credits: 4+1
Paper:4	Physiology, Nutritional and Clinical Biochemistry	Hrs/Wk: 4+2 (T+L)

Aim and objectives of Course (Physiology, Nutritional and Clinical Biochemistry):

The student will get knowledge on different physiological systems and their functions in the human body. By studying blood, its composition and its functions the student will understand the importance of blood.

Learning outcomes of Course:

This course will also provide knowledge on hormones, their functions and the diseases occurring due to alterations in the levels of hormones.

By studying this course the student will know the nutritional importance of proteins, carbohydrates, lipids, vitamins and minerals.

Clinical biochemistry unit along with practicals will enable the student to do diagnostic tests for liver diseases, Gastro intestinal diseases, renal diseases and nutritional deficiencies.

Unit-I: Digestion and Blood

12hours

Digestion and absorption of carbohydrates, lipids and proteins. Role of enzymes and gastrointestinal hormones in digestion. Composition of blood, Blood groups, coagulation of blood and disorders of blood coagulation (haemophilia). Hemoglobin and transport of gases in blood (oxygen and CO₂). Types of anemias, haemoglobinopathies-sickle cell anemia.

Unit-II: Nervous system and excretory system

12hours

Introduction to nervous system, general organization of nervous system, Neurons-structure, types, properties and functions; Neurotransmitters, Cerebrospinal

fluid-composition and functions, Reflex-types and properties.

Introduction to excretory system. Organization of kidney, Structure and functions of nephron, Urine formation, Role of kidneys in maintaining acid-base and electrolyte balance in the body.

Unit III: Endocrinology 12 hours

Endocrinology- organization of endocrine system. Classification of hormones. Outlines of chemistry, physiological role and disorders of hormones of thyroid, parathyroid, pituitary and hypothalamus. Introduction of gastrointestinal hormones. Mechanism of hormonal action- signal transduction pathways for glucocorticoids and insulin. Adrenalin, estrogen and progesterone.

Unit- IV: Nutritional Biochemistry 12hours

Balanced diet. Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins. Biological value of proteins. Malnutrition- Kwashiorkor, Marasmus and PEM.

Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins. Introduction to nutraceutical and functional foods. Bulk and trace elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F.

Unit- V: Clinical Biochemistry 12hours

Plasma proteins in health and disease. Liver diseases-jaundice. Liver function tests-conjugated and total bilirubin in serum, albumin: globulin ratio, Serum enzymes in liver diseases-SGOT, SGPT, GGT, CPK, Acid and alkaline phosphatases. Serum lipids and lipoproteins. Normal and abnormal constituents of urine. Renal function tests-Blood urea, creatinine, GFR, creatinine clearance. GTT and gastric and pancreatic function tests.

List of practical Experiments:

1. Estimation of calcium by titrimetry
2. Estimation of iron by Wong's method.
3. Estimation of vitamin C by 2, 6 -dichlorophenol indophenol method.
4. Determination of iodine value of an oil.
5. Estimation of hemoglobin in blood.
6. Total count - RBC and WBC. Differential count.
7. Determination of blood group and Rh typing.
8. Visualization of antigen antibody reactions (Ouchterlony technique).
9. Urine analysis for albumin, sugars and ketone bodies.
10. Estimation of urinary creatinine.
11. Estimation of blood Glucose.
12. Estimation of serum total cholesterol.

Recommended books:

1. Essentials of Food and Nutrition, Vol. I & II, M.S. Swaminathan.
2. Text Book of Biochemistry with clinical correlations. Thomas M. Devlin (John Wiley).
3. Harper's Review of Biochemistry, Murray et al (Longman).
4. Biochemical aspects of human disease – R.S. Elkeles and A.S. Tavit. (Blackwell Scientific Publications).
5. Clinical chemistry in diagnosis and treatment–Joan F.Zilva and P.R.Pannall (Lloyd-Luke Medical Books, 1988).
6. Varley's Practical clinical Biochemistry – Ed. Alan W. Gowenlock (Heinemann Medical Books, London, 1988).

B.Sc.	BIO-CHEMISTRY (Semester - IV)	Credits: 4+1
Paper:5	Microbiology, Immunology and Molecular Biology	Hrs/Wk: 4+2 (T+L)

Aim and objectives of Course (Microbiology, Immunology and Molecular biology):

- This course will enable the student to know various microbes such as bacteria, fungi and viruses, their structures and other properties and diseases caused by them.
- The student will also get knowledge in their commercial applications by making use of their beneficial effects such as fermentation in alcohol production, nitrogen fixation in agriculture etc.

Learning outcome of Course:

- The student will get knowledge in immune system, vaccines and also understand the pathogenesis of auto immune diseases and immune deficiency diseases.
- This course will provide knowledge and expertise in molecular biology such as genes, their structure and importance. This will also enable the student to know the applications of PCR in cloning and diagnosis of genetic and viral diseases.
- The practicals will provide the expertise to the student to work in microbiology laboratory, food and pharma industries, and biotech companies for production of vaccines and other life-saving drugs.

Unit-I: Microbiology

12hours

Introduction to microbiology and microbial diversity. Classification of microorganisms- prokaryotic and eukaryotic microorganisms. Bacterial structure, growth curve and kinetics of growth. Introduction to viruses-plant and animal viruses, structure, life cycle, Food and dairy microbiology. Nitrogen Fixation Nitrogen cycle, Non-biological and biological nitrogen fixation, photosynthetic and non-photosynthetic systems, Nitrogenase system. Utilization of nitrate ion, Ammonia incorporation into organic compounds

Unit-II: Microbial techniques:

12 hours

Preparation of different growth media, isolation and culturing and preservation of microbes, Gram's staining- Gram positive and Gram-negative bacteria, motility and

sporulation, Sterilization techniques -Physical methods, chemical methods, radiation methods, ultrasonic and antibiotic resistance.

Unit-III: Applied Biochemistry

12 hours

Fermentation Technology: Batch, continuous culture techniques, principle, types of fermentors. Pasteur Effect. Industrial production of chemicals- alcohol, acids (citric acid), solvents (acetone), antibiotics (penicillin), Enzyme Technology: Immobilization of enzymes and cells, industrial applications, enzymes in Bioremediation.

Unit- IV: Immunology

12hours

Organs and cells of immune system. Innate and acquired immunity, Cell mediated and humoral immunity (T-cells and B-cells). Classification of immunoglobulins, structure of IgG. Epitopes / antigenic determinants. Concept of haptens. Adjuvants. Monoclonal antibodies. Antigen-antibody reactions- agglutination, immunoprecipitation, immunodiffusion. Blood group antigens. Immunodiagnosics- ELISA, RIA. Vaccines and their classification. Traditional vaccines-live and attenuated. Modern vaccines- recombinant and peptide vaccines. Outlines of hypersensitivity reactions.

Unit- V: Molecular biology

12 hours

Types of RNA and DNA, DNA replication-leading and lagging strands, Okazaki fragments, inhibitors of DNA replication. Genetic code, Protein synthesis-transcription, translation, inhibitors of protein synthesis. Outlines of cloning technology, vectors, restriction enzymes, PCR, applications of cloning in agriculture, industry and medical fields.

List of Practical Experiments

1. Biosafety and good laboratory practices (GLP) of Microbiology.
2. Sterilization of microbial media by autoclave.
3. Isolation of pure cultures: (i) Streak plate method. (ii) Serial dilution method.
4. Demonstration of alcohol fermentation.
5. Antibiotic sensitivity by paper disc method.
6. Effect of nitrogen sources on growth of *E. coli*
7. Immunodiffusion by Ouchterlony method.
8. Blood group analysis.
9. Isolation of DNA from plant tissues.
10. Spotters.

Recommended books:

1. Willey MJ, Sherwood, LM & Woolverton C J (2013) Prescott, Harley and Klein's Microbiology by. 9th Ed., McGraw Hill.
2. Atlas RM. (1997). Principles of Microbiology. 2nd edition. W. M. T. Brown Publishers.
3. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.
4. Fermentation Technology (2nd ed.) Standury (Pergman press)
5. Biotechnology: Textbook of Industrial microbiology 2nd Edit. by Crueger and Crueger (2000).
6. Principles of Biochemistry, White. A; Handler P and Smith.
7. Ivan M. Roitt; Essential Immunology (Latest Edition). Blackwell Scientific Publications.
8. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition
W.H. Freeman and Company, New York.
9. Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley

Blackwell Publication.

10. Watson JD, Baker TA, Bell SP, Gann A, Levine M and Losick R (2008)
Molecular Biology of the Gene, 6th edition, Cold Spring Harbour Lab. Press,
Pearson Publication.

11. Molecular biology by David Freifelder.

PAPER – 7 GENETIC ENGINEERING

outlines of cloning strategies, DNA sequencing – Maxam gillbert and sangers Method, tools rDNA technology – Enzymes Restriction Endonuclease , ligase, phosphatase, Reverse transcriptase, polynucleotide kinases, terminal transferases , nucleases: s_1 RNase H

UNIT II :

Restriction mapping,cloning vectors,plasmids,Ti-plasmids,Cosmids,lamda phage shuttle vectors,expression vectors,host_e.coli,saccharomyces cervesiae,agrobacterium tumifaciens.

UNIT III:

Construction of C_DNA and genome libraries,Isolation and sequencing of cloned genes – colony hybridization, Nucleic acid hybridization.Reporter genes(**β -galactose,green fluorescent protein GFP**)

UNIT IV :

Polymerase chain reaction,principle and applications Outline of blotting techniques-southern,northern and western. Applications of gene cloning . Production of Insulun and Human growth hormone,Production of BT-cotton and edible vaccines.

UNIT V

Introduction to bioinformatics-defenitions of proteomics and genomics,Gene bank NCBI,DDBJ,Swissport,PDB,sequence alignments—BLAST and FASTA.

PAPER -7 ADVANCES IN BIOCHEMISTRY

Molecular biology Techniques

- 1.1 DNA sequencing – Maxam Gilbert and Sangers’s Method
- 1.2 Polymerase chain reaction [PCR] and its applicatons
- 1.3 Types of PCR and their Applications- Multiplex, nested, inverse, real time, Quantitative, Hot – start , touch down;
- 1.4 Methods of nucleic acid Hybridization – southern , Nothern and western blotting techniques;
- 1.5 Methods for measuring nucleic acids and protein interactions- foot printing, CAT Assay, jel shift analysis
- 1.6 DNA markers in gentetic analysis – RFLP,PCR based RAPD markers,minisatellites,microsatillites
- 1.7 DNA finger printing

Unit 2 : plant tissue culture

- 2.1 plant tissue culture : culture media – composition and preparation.
- 2.2 Totipotency,Organogenesis and plant regeneration
- 2.3 Somatic embryogenesis,artificial seeds,different stages of micropropagation
- 2.4 Isolation and culture of protoplasts,Somatic hybridization
- 2.5 Cybrids,Anther culture
- 2.6 Transgenic plants and their applications

UNIT-3:Animal tissue culture:Principles and applications

- 3.1 Cell structure technique:Cell culture media,Sterilization techniques
- 3.2 Cell lines,characteristic feature of cell lines and maintainance

Methods of separation of various cell types(Physical and enzymatic methods)

Genetic manipulation of cells –Physical(microinjection)and chemical methods

Commercial applications of cell structure :cell based manufacturing(vaccines),toxicity testing and tissue engineering

UNIT-4: Stem cells and its applications

4.1 Stem cells-sources embryonic stem cells,adult stem cells,cord blood stem cells

4.2 Generation of stem cells by cloning ,stem cell differentiation,stem cell plasticity, preservation of stem cells.

4.3 Organogenesis through stem cells for transplantation

4.4 Application of stem cell therapy-Parkinson's disease and Alzheimer's diseases

UNIT-5 Vaccines

5.1 Vaccine classification

5.2 Principles of vaccination Design of Vaccines

5.3 Conventional vaccines-Whole organism, Live and Attenuated, Purified macromolecules

5.4 New generation Vaccine-Recombinant Antigen Vaccine, Recombinant vector antigen

5.5 DNA Vaccines, Synthetic vaccines, Edible Vaccine

5.6 vaccine delivery systems-Liposomes,micelles,ISCOMS.

5.7 Strategies for developing vaccine for malaria,HIVand COVID -19

Recommended books:

1. Plant cell and tissue culture- A tool in Biotechnology-Neumann,Karl-Hermann et.al

2. Plant Tissue culture-Roberta Smith, III Edition.

3.Introduction to plant Biotechnology-H.S.Chawla III Edition.

4. Text book of Animal Biotechnology- B. Singh, S.K. Goutam
5. Vaccine adjuvants and delivery systems- Manmohan Singh
6. Nanoparticulate vaccine delivery systems- Martin.J.D Souza
7. Metabolic engineering : principles and methodologies – Aristos A et.al
8. Human embryonic stem cells – Ann Kiessling, Scott C. Anderson, 2nd ed.

MINUTES OF THE BOARD OF STUDIES MEETING (2022-2023)

Board of Studies meeting in UG Nutrition and Dietetics was conducted on 15th June at 10.00 am. It was commenced with prayer by Mrs. B.Radha. Members present in the meeting are :

1. Dr.P.Mercy – Principal
2. Dr. K.N.VaraLakshmi, Sri Durga Malleswara Siddartha Mahila Kalasala, Vijayawada- University
Nomine
3. Dr.P.Ashlesha, HOD, Telangana Mahila University (Koti women's College of University OU)
Hyderabad – Subject Expert

FACULTY

4. Prof.P.Jyothi Kumari, Head of the Department
5. Mrs.Ch.Sushma, Assistant Professor
6. Mrs.B.Radha, Assistant Professor
7. Mrs. G.N.S.S. Navya, Assistant Professor

STUDENTS

8. S.Pavani – III MBN Student representative
9. J. Mahalakshmi – III ZNC Student representative

RESOLUTIONS :

After thorough review of the syllabus, the members felt that modifications can be done on the basis of autonomy. According to the combinations we have i.e., MBN and ZNC, the papers may be added with certain topics in place of repetition. The papers in the APSCHE given syllabus are rearranged according to the need and the combinations .

The members resolved that

- ❖ In paper I, unit V non-nutrient constituent of food can be given as student seminars since they are dealt in other courses of the programme.
- ❖ In paper II, chapter V food microbiology may be given for self study, and topics related to macro and micro nutrients analysis are included. Since they are dealt in microbiology core for MBNs and It was retained for ZNC students.
- ❖ In semester IV paper V : shifted to semester IV as an core for ZNCs , in place of which Nutrition and wellness paper is included for both MBN and ZNC students .
- ❖ Members also suggested quality aspects of food may be included in the V semester syllabus such as food quality and safety along with food service management for the purpose of placements in the food industry.
- ❖ A general elective may be offered to both combinations i.e. Research Methodology

The suggested papers MBN and ZNC are follows:

SEMESTERS	PAPERS	MBN	ZNC

I	PAPER – I	Basic nutrition	Basic nutrition
II	PAPER – II	Introduction to food science	Introduction to food science
III	PAPER - III	Community nutrition	Community nutrition
IV	PAPER - IV	Therapeutic Nutrition	Therapeutic Nutrition
	PAPER - V	Nutrition and Wellness	Nutrition and Wellness
V	PAPER –VI A	Food Service Management	-----
	PAPER – VII A	Food Quality and Safety	
	PAPER –VI B	-----	Nutritional Biochemistry
	PAPER – VII B		Food Quality and Safety
	PAPER –VI C		Food Processing and preservation
	PAPER – VII C		Food Microbiology
VI	Internship		
General Elective	Research Methodology		

Other suggestions:

1. I year : For Community Service Projects tie up's can be made with NGO'S or Sachivalayam.
2. II year : In-house projects may be encouraged and also students can be sent to
 - PHC to run counseling centers
 - To the Diagnostic centers and
 - Training in hospitals
3. III year : For the internship final year students can be sent to
 - Organize diet counselling at hospitals where there are no dietitians .
 - Internships in industries
 - Internships online from hospitals like Apollo, Yashoda etc
 - Workshops and trainings at CFTRI, Hyd
 - Training in industries on value added products
 - Adulteration and analysis
 - Water analysis in water plants

- Training at mango pulp processing units

With the vote of thanks by the chair person the meeting was concluded.

DEPARTMENT OF NUTRITION & DIETETICS

SEMESTER – I - PAPER – I - BASIC NUTRITION

Theory:4hrs/week
Practical: 2 hrs/week

THEORY

UNIT-I - Introduction to Nutrition and Macro Nutrients

Concepts of Nutrition – Definition of terms – Food, nutrition and Nutrients. Basic five Food groups and their functions, Food pyramid. Balanced diet – definition and its importance, my plate. Introduction and scope of Nutrition, relationship between Food, Nutrition, Health and Disease

UNIT – II Macro Nutrients – Classification, functions, digestion, absorption, dietary sources, RDA, clinical manifestations of deficiency and excess and storage of the following in the body.

- Carbohydrates
- Lipids
- Proteins

UNIT – III Micro nutrients- Vitamins

- Vitamins – Classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following
 - Fat soluble vitamins - A, D, E and K
 - Water soluble vitamins - B Complex Vitamins - Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Cyanocobalamin and Vitamin C.

UNIT - IV Micro nutrients -Minerals

- Minerals – classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following
 - Macro minerals – Calcium, Phosphorous, Magnesium, Sodium and Potassium
 - Micro minerals or Trace elements – Iron, Iodine, Fluorine and Zinc

UNIT - V Energy Metabolism

- Energy value of foods – Determination of gross energy value of foods using Bomb calorimeter and Oxy calorimeter. Physiological energy value of foods.
- Basal Metabolism - Factors affecting Basal Metabolic Rate, Measurement of BMR by Direct and Indirect Calorimetry.
- Computing Energy requirements of the body based on Basal metabolic rate, Physical activity and Thermic effect of food. RDA and sources of energy.

PRACTICALS

1. List out the common foods and to learn their names in Telugu, English, Hindi and Urdu.
2. Learn to identify the different food samples and to know their nutrient composition.
3. Market survey
4. Dietary sources, Recommended Dietary Allowances and planning of recipes of the following nutrients
 - Macronutrients

- Carbohydrates
 - Proteins
 - Fats
 - Fiber
5. Micronutrients
- Vitamins –
 - Vitamin A
 - Vitamin C
 - Minerals –
 - Calcium
 - Iron

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahman, (2016) Textbook of Human Nutrition, 4th edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Longvah, T., Ananthan, R., Bhaskarachary, K. and Venkaiah, K. (2017). Indian Food Composition Tables, Published by NIN
3. Raheena Begum, (2013). Textbook of Food, Nutrition and Dietetics, 3rd edition, Sterling Publishers Pvt. Ltd.
4. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1st edition, Orient Black Swan Private Limited
5. Shubhangini A. Joshi, (2002). Nutrition and Dietetics, 2nd edition, Tata McGraw-Hill Publishing Company Ltd.
6. Srilakshmi, B., (2018). Nutrition Science, 6th edition, New Age International Publishers.
7. Swaminadhan S, (2005). Advanced Text book on foods & nutrition, Vol. I&II (2nd revised and enlarged) Bappco.
8. VijayaKhader, (2000). Food, nutrition & health, Kalyani Publishers.

DEPARTMENT OF NUTRITION & DIETETICS

SEMESTER – II - PAPER – II - INTRODUCTION TO FOOD SCIENCE

Theory: 4hours/week
Practicals: 2hours/week

THEORY

Unit-I Introduction to Food Science

- Methods of cooking -Preliminary preparations -Advantages and disadvantages of each method.

Unit-II Plant Foods

- Cereals and Millets-structure, Composition and nutritive value, processing-methods of cooking and storage
- Pulses and Legumes- Selection, nutritive value, storage and processing-methods of cooking

- Vegetables and Fruits- Classification, Selection, Nutritional aspects, Pigments, Enzymatic and non-enzymatic browning.
- Nuts and oil seeds- Nutritive value , use in cookery

Unit-III Animal Foods

- Milk and milk Products - nutritive value, use in cookery
- Egg -structure, nutritive value, methods to assess quality of eggs, changes during storage and --use in cookery
- Meat, Poultry, Fish - nutritive value, use in cookery
- Spices and condiments- nutritive value, use in cookery

Unit-IV Food Processing

- Food additives- types and their role in food processing
- Nutrient Enrichment -- Germination, fermentation, fortification .
- Multipurpose foods, Convenience and Ready to eat foods -Advantages and disadvantages

Unit - V Food Microbiology

- Food Spoilage – Microorganisms causing spoilage – Factors responsible for spoilage and changes brought about in food by microorganisms
- Microorganisms that bring about useful changes in food.
- Microbiology of different foods – Contamination and spoilage of milk, egg, meat, fish, vegetables and fruits

PRACTICALS

1. Standardization of weights and measures of various food items.
2. Cereals, pulse and vegetable preparations and calculation of nutritive values of recipe .
3. Milk, meat, egg preparations and calculation of nutritive values of recipes.
4. Demonstration of Drying, Fermentation and germination processing techniques.

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Manay N.Shakuntala&ShadaksharaSwamy.(2008). Foods, Facts and Principles, 3rd edition, New Age International Publishers. .
3. Reddy,S.M.(2015). Basic Food Science & Technology, 1st edition, New Age International Publishers.
4. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra, S. (2010). Basic Food Preparation: A Complete Manual, Fourth Edition, Orient Black Swan Ltd.
5. Sumati R. Mudambi, M.V. Rajagopal. (2006). Food Science, 2nd edition, New Age International Publishers.
6. Srilakshmi, B.(2018). Food Science, 7th edition, New Age International Publishers.
7. Wardlaw MG, Insel PM. (2004). Perspectives in Nutrition, Sixth Edition, Mosby Publishers.

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – III - PAPER – III – NUTRITION AND WELLNESS

Theory: 4hrs/week
Practicals: 2hrs./week

THEORY

UNIT I: Principles of meal Planning, Balanced Diet. Dietary guidelines for Indians

Nutrition for Adults - Reference man and Reference women- Nutritional requirements for adult man and woman of different physical activities (Sedentary, Moderate and Heavy work). Introduction to Fitness and Training Benefits of Exercise. Components of physical fitness.

UNIT II : Alternative systems for Health and fitness. Holistic approach to management of health and fitness including diet and exercise (Aerobic and anaerobic).

UNIT III: Musculo-skeletal Systems - Anaerobic exercise effect on musculoskeletal system. Endurance, strength/ Power, Speed, Coordination, agility, balance etc. Effect of aerobic exercise on heart rate, blood pressure and lung function.

UNIT IV: Water and Electrolyte Balance: Regime of hydration and dehydration. Symptoms and effect of dehydration. Sports Drink. Nutragenic aids and supplements.

UNIT V: Formulating dietary guidelines for- Fitness and health, Obesity management and Critically analyzing different established weight reduction diet plans. Management of diabetes mellitus and Management of CVD.

REFERENCES:

1. Mahan, L.K. & Ecott-Stump, S. (2000): Krause's Food, Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Whitney, E.N. & Rolfes, S.R. (1999): Understanding Nutrition, 8th Edition, West/Wadsworth, An International Thomson Publishing Co.
3. Ira Wolinsky (Ed) (1998): Nutrition in Exercise and Sports, 3rd Edition, CRC Press.
4. Parizkova, J. Nutrition, physical activity and health in early life, Ed. Wolinsky, I., CRC Press.
5. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999): Modern Nutrition in Health & Disease, 9th Edition, Williams & Wilkins.
6. McArdle, W. Katch, F. and Katch, V. (1996) Exercise Physiology. Energy, Nutrition and Human Performance, 4th edition, Williams and Wilkins, Philadelphia.

PRACTICALS

1. Planning and preparation of a balanced diet for adult man and women.
2. Effect of Specific Nutrients on Work Performance and Physical Fitness and Training diets.
3. Market survey and consumption pattern of nutrigenic aids and supplements.
4. Exercise prescription in Obesity and weight control – Prevention of weight cycling.
4. Exercise prescription in Diabetes
5. Exercise prescription in Hypertension and Coronary Heart Disease
6. Exercise prescription in Osteo Arthritis and Osteoporosis
7. Exercise prescription in Spondylitis Back aches
8. Exercise regime for pre and post-natal fitness.

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – IV - PAPER – IV - COMMUNITY NUTRITION

Theory: 4Hours/Week
Practicals: 2Hours/Week

THEORY

Unit-I Nutrition during Pregnancy and Lactation

- Pregnancy-Nutrition and Food requirements- Physiological changes and complications.
- Lactation- Physiology, Nutritional and Food requirements

Unit-II Nutrition during Childhood

- Infancy - Nutritional requirements – Breast feeding and its advantages; Artificial/bottle feeding; Weaning Practices, Supplementary foods.
- Early childhood - Nutritional requirements – RDA, Inculcating healthy eating habits among pre-schoolers
- Late childhood - Nutritional requirements – RDA, Food habits, Importance of breakfast and packed lunch.
- Traditional foods and Junk foods – Impact on health

Unit-III Nutrition during Adolescence and Old age

- **Adolescence**-Nutritional requirements –RDA, Food habits
 - Nutritional problems and Eating Disorders- Anorexia and Bulimia.
- **Geriatric Nutrition**- Physiological changes in elderly
 - Factors affecting food intake
 - Nutrient needs and Requirements
 - Nutrition related problems and their diet management

Unit-IV Nutritional Status Assessment

- Assessment of the Nutritional Status of the Community
- Direct methods-- Anthropometry, Biochemical Analysis, Clinical Examination, Diet Surveys, Functional assessment and Biophysical or Radiological examination.
- Indirect methods - Ecological factors and Vital Health Statistics

Unit –V Nutritional Problems, Programs and Education

- Nutrition problems prevalent in India - Under nutrition – PEM and deficiencies of Vitamin A, Iron and Iodine; Over nutrition
- Community Nutrition Programmes to combat malnutrition - Supplementary Feeding Programmes - ICDS, School lunch programme; Prophylactic Programmes to prevent Vitamin A, Iron, Iodine deficiencies
- Role of National and International Organizations in combating malnutrition - NIN, CFTRI, NNMB, WHO, FAO, CARE and UNICEF
- Nutrition Education – Definition, methods used in nutrition education to improve nutritional and health status of people.

PRACTICALS

1. Planning and preparation of a balanced diet for Pregnant and Nursing mother.
2. Planning and preparation of a balanced diet for a Pre School Child.
3. Planning and preparation of a balanced diet during Adolescence.
4. Use of Anthropometric measurements in assessing the nutritional status.
5. Visit to ICDS and Anganwadi -Observation of a mid-day programme at AnganwadiCenter.
6. Visit to government school-Observation and Planning of School Lunch Programmes

REFERENCES

1. Bamji MS, Krishnaswamy K, BrahmamGNV (2016). "Textbook of Human Nutrition", 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Dietary Guidelines for Indians – A Manual (2011). published by NIN.
3. Food Composition Tables, (2017). published by NIN.
4. PrabhaBisht, Community Nutrition in India, Star Publications, Agra.
5. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation: A Complete Manual, Fourth Edition. Orient Black Swan Ltd.
6. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1st edition, Orient Black Swan.
7. Sara Abraham (2016). Nutrition through life cycle, 1st edition, New Age International Publishers.
8. Srilakahsmi, B. (2018). Food Science , 7th edition, New Age International (P) Ltd.
9. Srilakahsmi, B. (2018). Nutrition Science, 6th edition, New Age International (P) Ltd.
10. Srilakahsmi, B. (2019). Dietetics, 8th edition, New Age International (P) Ltd.
11. Suryatapa Das (2018). Textbook of Community Nutrition” 3rd edition, Academic Publishers.
12. Swaminadhan, M. (1985). Essentials of Food and Nutrition Volume I and II ”, 2nd edition, The Bangalore Printing and Publishing Co. Ltd., Bangalore

DEPARTMENT OF NUTRITION & DIETETICS

SEMESTER – IV - PAPER – V - THERAPEUTIC NUTRITION

Theory: 4hrs/week

Practicals: 2hrs/week

THEORY

Unit -I Introduction to Therapeutic Nutrition

- Therapeutic Nutrition – Purpose of Diet Therapy, Therapeutic adaptation of normal diets - liquid, soft and special feeding methods, pre- and post operative diets.
- Dietitian – Qualification, Roles and responsibilities, Diet counselling.
- IDA – Objectives, membership, Registered Dietician – Eligibility for R.D.exam.

Unit -II Malnutrition and Fevers

- Fevers – Acute and Chronic fevers – Typhoid, T.B. – Causes, symptoms and dietary management
- Under weight, Overweight and Obesity – Causes, assessment, symptoms and dietary management and complications

Unit -III Gastrointestinal and Liver Diseases

- Gastrointestinal Diseases - Dyspepsia, Peptic ulcer, Diarrhoea, Constipation and Malabsorption Syndrome – Steatorrhea, Celiac disease and Tropical Sprue – Causes, symptoms and dietary management
- Liver diseases – Hepatitis, Cirrhosis of liver - Causes, symptoms and dietary management

Unit -IV Cardio-vascular and Renal Diseases

- Cardio-Vascular Diseases – Role of fat in the development of Atherosclerosis, Hypertension - Causes, symptoms and dietary management
- Kidney disease – Nephritis, Nephrosis, Renal Failure, and Renal calculi - Causes, symptoms and dietary management

Unit -V Diabetes and Cancer

- Diabetes Mellitus - Classification, causes, symptoms,
- Tests for detection of Diabetes Mellitus , Dietary management- and complications
- Cancer –Carcinogenic process-Classification, symptoms,
- Risk factors-genetic and environmental.
- Nutrients and cancer- Dietary guidelines for prevention of cancer

PRACTICALS

Planning and preparation of the following diets

1. Preparation of modified diets-Liquid and Soft diets.
2. Planning and preparation of diet in fevers – Typhoid and T.B.
3. Planning and preparation of diets for Underweight and Obesity.
2. Planning and preparation of diet in diseases of Gastrointestinal System – Peptic Ulcer, Viral Hepatitis
3. Planning and preparation of diet in Cardio-Vascular diseases – Atherosclerosis and Hypertension
4. Planning and preparation of diet in Kidney diseases – Nephritis
5. Planning and preparation of diet in Diabetes Mellitus

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). “The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt. Ltd.
3. NIN. (2017). Food Composition Tables , National Institute of Nutrition, Hyderabad.
4. Srilakahsmi, B. (2019).Dietetics , 8th edition, New Age International Publishers.
5. Srilakahsmi, B. (2018). Nutrition Science , 6th edition, New Age International Publishers.

6. Sumati R. Mudambi, Rajagopal, M.V. (2012). Fundamentals of Foods, Nutrition and Diet Therapy, 6th edition, New Age International Publishers.
7. Swaminadhan, M., (1988). Essentials of Food and Nutrition, Volume I and II, The Bangalore Printing and Publishing Co. Ltd., Bangalore.
8. Wardlaw MG & Insel PM. (2004). Perspectives in Nutrition, Sixth Edition,

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VI – Hospital Food Service management

UNIT-I

UNIT-1 Introduction to Food Service in Hospitals

- Food Service in Hospitals – Importance
- Role and functions of Dietitian in Food Service
- Management in Food Service – Principles, functions and tools of management
- Organizational chart of Food Service Team in Hospital

UNIT-2 Physical Requirements

- Kitchen – Physical facilities, layout, factors affecting working performance
- Storage Area – Types of storage, sanitary measures, safety and storage of food materials
- Equipment required for Hospital Food Service with reference to food storage, Preparation, holding and service – Classification and selection

UNIT-3 Food Material Management and Food Production

- Purchasing – Methods of purchasing foods
- Receiving and storing of food materials

- Menu planning for patients – types of menus and diets
- Food Production – Methods of preparing food; Safe food handling practices
- Different Methods of holding foods for service

UNIT-4 Food Service in Hospital-Styles and Services

- Food Service Styles and Food Service Systems
- Food Service Manager/Director – Leadership and managerial abilities
- Role, duties, qualities and skills of successful food service manager

UNIT-5 Dietary Accounting and Book Keeping

- Cost concept – Components, Factors responsible for losses and Cost control
- Accounting–Definition, Book of Accounts –Cash book, Purchase book, Sales book, Purchases return book, Sales return book and Journal, regular audit and logbooks.

I. Practical Syllabus

1. Introduction to Food Service Management in Hospital
2. Visit to Govt. hospital to observe kitchen layout, equipment, food production and service
3. Visit to a corporate hospital to observe kitchen layout, equipment, food production and Service
4. Organization chart and identification of duties in a hospital
5. Purchasing methods for food items
6. Calculation of food cost
7. Records maintained in a dietary department
8. Planning of kitchen layouts
9. Comparative study of Government and Corporate Hospitals in providing food service to the Patient

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VII – Food Quality and Safety

- Unit – I** Food Quality – Definition- Food Quality and its need in food industry - Food Quality control objectives- Importance – Functions of quality control – Stages of quality control in Food industry- Methods of quality control – Quality attributes- Classification of quality attributes.
- Unit – II** Sensory evaluation: Requirements and methods –Sensory parameters: Colour, flavour, texture, Taste, aroma, general and overall acceptability –Subjective and objective test of sensory parameters (Differential test, Rating test, Sensory threshold test)
- Unit – III** Quality assessment of Food materials i.e. Cereals, Pulses, Fruits, Vegetables products, Meat, Poultry, Egg, Processed food products- selection method, Food Standards – selection method, Food Standards- Food packaging and labelling methods - Recent trends
- Unit – IV** Food safety- Definition, factors affecting food safety - importance of food safety - Risks and hazards - - microbial consideration in food safety- Role of food analyst- good practices- statutory and regulatory requirements - Certification - HACCP, ISO-22000, FSSC-22000.
- Unit – V** Food Adulteration and Adulterants: Meaning, Methods to identify the presence of adulterants-Types of adulteration in various foods-Intentional,

incidental and metallic contaminants - Consequences of adulteration

1. Sensory and instrumental methods for measuring food sensory attributes.
2. Selection and training of sensory panel
3. Assessment of sensory evaluation of foods by Hedonic scale
4. Quality assessment of cereals
5. Quality assessment of fruits and vegetables
6. Quality assessment of meat, poultry and other processed products.
7. Quality assessment of dairy products.
8. Quality assessment of Processed food products
9. Microbiological examination of different food samples.
10. Demonstration of safe food handling procedure

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VI B – NUTRITIONAL BIOCHEMISTRY

UNIT-I

Metabolism of Carbohydrates

- Introduction to Metabolism – Catabolism and anabolism.
- Metabolism of Carbohydrates– Utilization of glucose after absorption, Homeostasis of glucose – Role of liver and Hormones in regulation of blood glucose level, Glucose Tolerance Test.
- +Anaerobic and aerobic metabolisms of Carbohydrates - Glycolysis and Krebs's cycle.

UNIT-II

Metabolism of fats and Proteins: Blood lipids, oxidation of fatty acids, role of liver in fat metabolism, fatty liver. Biosynthesis of cholesterol, bile acids, prostaglandins. General pathway of proteins and amino acids metabolism- Ornithine cycle.

UNIT-III

Enzymes – Definition, Properties, Classification, Enzyme Specificity, Enzyme Action, Inhibition and Factors effecting Enzyme Activity.

PRACTICALS

1. Preparation of acids, bases, buffers, measuring pH.
2. Qualitative analysis –Identification of carbohydrates
3. Qualitative analysis –Identification of proteins and amino acids
4. Qualitative analysis of Lipids.
5. Qualitative analysis of food enzymes-plant and animal.

REFERENCES

1. Rama Rao, A.V.SS. (2015) A Text book of Biochemistry, 6th edition, UBSPD publications.
2. Singh S.P., (2011), Principles of Biochemistry, CBS Publishers.
3. Satyanarayana, U. (2000). Biochemistry, 2nd edition, Uppala Author publishers.
4. Dulsy Fatima, Dr. L.M. Narayanan (2005). Biochemistry, 1st edition, Saras publications.

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VII B – FOOD QUALITY AND SAFETY

Theory: 4hrs/week
Practicals: 2hrs./week

THEORY

UNIT-I

Introduction to quality control, advantages and disadvantages of QC. Sensory evaluation-what, why & how, types of testing, application in food industry. Safe food preparation practices, contamination- classification of toxic chemicals in foods.

UNIT-II

Quality assurance -consumer specifications for quality factors, testing methods, good manufacturing practices-hygienic requirements, Importance and scope of Law in consumer protection.

UNIT-III

National and international food laws and PFA regulations of food safety. FSS - PFA, FPO, BIS AGMARK, CODEX Alimentaris, WTO, ISO, FAO, WHO, implementation of HACCP.

UNIT-IV

Food additives types – Acids, Acidity regulators, Anticaking agents, Antifoaming agents, Antioxidants, Bulking agents, Food coloring, Color retention agents, Emulsifiers, Flavors, Flavor enhancers, Glazing agents, Humectants, Preservatives, Stabilizers, Sweeteners, Thickeners – Functional Foods – Food Adulteration –Types – Consumer protection act.

UNIT-V

Food packaging- Packaging materials their properties, importance of packaging, functions of packaging, primary elements of package forms, material and decoration. Various package forms- products, tubes, tetra packs, cans bottles. Advantages and limitations of packaging material, Al glass, tinned steel plate, carbon board, paper flexible, films, laminates and others.

PRACTICALS

1. Testing quality of different foods
2. Detection of adulterants in foods
3. Detection of food additives in foods
4. Sensory evaluation tests- Rating tests, Difference tests
5. Visit to rice processing industry
6. Visit to Bakery
7. Visit to milk processing industry
8. Visit to meat processing industry
9. Visit to oil processing industry
10. Visit to sugar processing industry
11. Visit to FCI

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VI C – FOOD PROCESSING & PRESERVATION

UNIT-I

Objectives of food processing, causes of food spoilage. Introduction To Food Processing and Preservation, Processing of cereals: Milling of rice, parboiling, malting.

Cereal products- flours, extruded foods, breakfast cereals ,puffed and flaked cereals. Fermented Cereal Products .

UNIT-II

Processing of **Pulses**: wet process, dry process, grading. Pulse Products-Puffed Chick Pea, Peas, Quick Cooking Dal, Canned Dry Peas. Fermented pulse products.

UNIT-III

Animal foods: Milk and Milk products: Effect of processing on milk, Dairy products-Butter, paneer, Yogurt, Ghee, khoa, Rabbri, milk Powder concentrated and dried products frozen desserts, Fermented milk products- Kefir, Yogurt,cheese. Nonfermented Milk Products- Rubedy, Skimmed Milk, Evaporated Milk.

Meat:-Processing of meat, meat products-Ham, Sausages, hotdogs organ meat **Egg:-** Processing of Eggs-products of egg, low cholesterol egg substitutes

Fish:-Processing of fish and sea foods, by products- Fish meal, Fish Protein concentrate, Fish Liver oils.

Fruits and vegetables – processing - effect of processing, spoilage – Jams, Jellies, Pickles, Squashes, Sauces.

UNIT-IV

Fermented foods- fruit/vegetable-pickles, sour pickles, sauces, .Fruits and vegetables-processing- Effect of processing and preservation-on jams, jellies, squashes, pickles, beverages.

UNIT-V

Nutritional importance of fermented foods, Ready to eat and ready to use products.

PRACTICALS

Visit to food processing units:

- 1) Grain processing units
- 2) Dairy industry
- 3) Bacon factory
- 4) Mango pulp industry
- 5) Sugar industry
- 6) Fermentation units
- 7) Priya pickles
- 8) Bottling units

DEPARTMENT OF NUTRITION & DIETETICS
SEMESTER – V - PAPER – VII C – FOOD MICROBIOLOGY

UNIT-I

Common microbes present in foods-Bacteria, yeast and moulds-general characteristics. - Culture media solid, liquid media etc, isolating pure culture, culturing techniques. Identification of microorganisms-morphology, staining.

UNIT-II

Food poisoning-diseases transmitted through food and water. Testing water for human consumption, treatment of kitchen sewage disposal.

UNIT-III

Common microbes in food-contamination and spoilage

- a) Cereals, pulses, nuts

- b) Fruits and vegetables
- c) Milk and milk products
- d) Meat, egg and fish

UNIT-IV

Food preservation- Principles of preservation – Methods, irradiation, pasteurization, cold storage, drying, canning, waxing, fruit juices, jams, jellies, candies, marmalades, effect of concentration.

UNIT-V

Food adulteration-definition, types, effect of common adulterants in food. Detection techniques, Food (standards) laws and regulations.

PRACTICALS

1. Examination Of Parts Of Microscope
2. Preperation Of Nutrient Broth And Agar
3. Culturing Methods
4. Staining Methods
 - A) Simple Staining
 - B)Gram Positive
 - C) Gram Negative
5. Estimation Of Microbial Loading Foods
6. Visiting Bacon Factory
7. Visiting Milk Chilling Centre

8. Demonstrating Food Preservation Methods

9. Sterilization Techniques

DEPARTMENT OF NUTRITION & DIETETICS
GENERAL ELECTIVE – RESEARCH METHODOLOGY

UNIT-I

Introduction to Research Methodology- Objectives and motivation in research.

UNIT-II

Defining the Research Problem - Selecting and defining a research problem, Reviewing and conducting literature search, Developing a research plan.

UNIT-III

Designing of Experiment - Different experimental designs – single and multifactorial design, Making measurements and sources of error in measurements, Methods of data collection and record keeping.

UNIT-IV

Data Processing and Statistical Analysis - Processing operations, tabulation, and graphical representation, Statistics in research: Concepts of sample and population, Measure of central tendency, dispersion, asymmetry (skewness, kurtosis), Normal distribution (p-value), Statistical tests and hypothesis (Standard error, t-test, chi-square test), and regression analysis,

UNIT-V

Report writing - Writing a research paper - abstract, introduction, methodology, results and discussion.

Practicals

Based on the teaching above, each student will undertake the following exercises.

1. A teacher (adviser) who would guide the student will discuss with student and identify a topic of mutual interest.
2. The student will collect the literature, collate the information and write the same in the form of a term paper with proper incorporation of references using appropriate software such as EndNote.
3. The student will identify scope of research on the topic and will frame objectives to be addressed in the project through a work plan.
4. The student will write standard operating protocols (SOPs) and identify requirement for equipment and reagents.
5. Each student will be asked to make presentation about the project including literature available, objective sought and work plan including methodologies as described above.

Suggested Readings

1. Research in Education (1992) 6th ed., Best, J.W. and Kahn, J.V., Prentice Hall of India Pvt. Ltd.
2. At the Bench: A Laboratory Navigator (2005) Barker, K., Cold Spring Harbor Laboratory Press (New York), ISBN: 978-087969708-2.
3. Research Methodology - Methods and Techniques (2004) 2nd ed., Kothari C.R., New Age International Publishers.
4. Research Methodology: A Step by Step Guide for Beginners (2005) 2nd ed., Kumar R., Pearson Education.
5. Biostatistics: A Foundation for Analysis in the Health Sciences (2009) 9th ed., Daniel W.W., John Wiley and Sons Inc. 6. Statistics at the Bench: A Step-by-Step Handbook for Biologists (2010) Bremer, M. and Doerge, R.W., Cold Spring Harbor Laboratory Press (New York), ISBN: 978-0-879698-57-7.

B. Sc. HOME SCIENCE SYLLABUS 2022-2023

SEMESTER - I

HSC -101- BASIC NUTRITION

Theory:4hrs/week

Practical: 2 hrs/week

THEORY

UNIT-I Introduction to Nutrition and Macro Nutrients

- Introduction and scope of Nutrition, definitions, relationship between Food, Nutrition, Health and Disease
- Macro Nutrients – Classification, functions, digestion, absorption, dietary sources, RDA, clinical manifestations of deficiency and excess and storage of the following in the body.

- Carbohydrates
- Lipids
- Proteins

UNIT – II Micro nutrients- Vitamins

- Vitamins – Classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following

- Fat soluble vitamins - A, D, E and K
- Water soluble vitamins - B Complex Vitamins - Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Cyanocobalamin and Vitamin C.

UNIT - III Minerals

- Minerals – classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following

- Macro minerals – Calcium, Phosphorous, Magnesium, Sodium and Potassium
- Micro minerals or Trace elements – Iron, Iodine, Fluorine and Zinc

UNIT - IV Energy and Water Metabolism

- Energy value of foods – Determination of gross energy value of foods using Bomb calorimeter and Oxy calorimeter. Physiological energy value of foods.

- Basal Metabolism - Factors affecting Basal Metabolic Rate, Measurement of BMR by Direct and Indirect Calorimetry.

- Computing Energy requirements of the body based on Basal metabolic rate, Physical activity and Thermic effect of food. RDA and sources of energy.

UNIT – V Water and Non Nutrient constituents of Food

- Water - Functions, sources, requirement and regulation of water balance, Effect of deficiency and excess - Dehydration and over hydration; Electrolyte balance.

- Non nutrient constituents of foods and their importance

- Phytochemicals – Curcumin, Lycopene, Flavonoids
- Antioxidants – Vitamin C, E and Carotenoids
- Detoxifying agents - Anthocyanins, Chlorophylls
- Beneficial effects of non- nutrient constituents of food on Health.

PRACTICALS

1. List out the common foods and to learn their names in Telugu, English, Hindi and Urdu.
2. Learn to identify the different food samples and to know their nutrient composition.
3. Market survey
4. Dietary sources, Recommended Dietary Allowances and planning of recipes of the following nutrients

- Macronutrients
- Carbohydrates
- Proteins
- Fats
- Fiber
- 5. Micronutrients
 - Vitamins –
 - Vitamin A
 - Vitamin C
 - Minerals –
 - Calcium
 - Iron

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahman, (2016) Textbook of Human Nutrition, 4th edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Longvah, T., Ananthan, R., Bhaskarachary, K. and Venkaiah, K. (2017). Indian Food Composition Tables, Published by NIN
3. Raheena Begum, (2013). Textbook of Food, Nutrition and Dietetics, 3rd edition, Sterling Publishers Pvt. Ltd.
4. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1st edition, Orient Black Swan Private Limited
5. Shubhangini A. Joshi, (2002). Nutrition and Dietetics, 2nd edition, Tata McGraw-Hill Publishing Company Ltd.
6. Srilakshmi, B., (2018). Nutrition Science, 6th edition, New Age International Publishers.
7. Swaminadhan S, (2005). Advanced Text book on foods & nutrition, Vol. I&II (2nd revised and enlarged) Bappco.
8. VijayaKhader, (2000). Food, nutrition & health, Kalyani Publishers.

SEMESTER - I

HSC-102 –General Psychology

Theory: 4hrs/week
Practicals: 2 hrs. /week

THEORY

UNIT I Introduction to Science of Behaviour

- Psychology as a Science of behaviour : Definition, scope and Methods of Studying Human Behaviour– Observation method , Experimental Method, Case Study method , Survey Method , Cross sectional and Longitudinal Methods- Merits and Demerits.
- Branches of Psychology –Definition and basic concept of different branches- Developmental Psychology, Clinical , Counselling psychology, Abnormal , Educational, Industrial, Social and Sports Psychology.

UNIT II Basic Psychological Concepts

- Attention– Definition, types -Voluntary and Involuntary determinants of attention.
- Perception – Definition, perceptual organization and perceptual Constancies and illusions.
- Memory – Definition, types and nature of memory. Methods of memorizing and factors influencing memory. Forgetting – types and causes. Ways of improving memory.
- Interests and Aptitude- Definition of the terms —factors affecting individual’s interest and attitude- Assessment of interests and attitudes using inventories and scales.

UNIT III Personality

- Personality:Definition, Concept and types of personality,-Normal and abnormal personalities, Factors affecting development of personality
 - Assessment of personality- Projective Tests- Definition CAT, TAT, Rorshach inkblot test.
- Major Psychological Approaches -- Psycho-dynamic, Behavioural, Humanistic, Cognitive , Socio-cultural and Trait perspectives.
- Psycho-dynamic Perspective : Freud’s Psycho-analytic theory- Understanding the structures of Id, ego and super ego and their interaction , Erickson’s Theory-Eight stages of development.

UNIT IV Major Psychological Approaches -I

- Behavioral Perspective: Learning -Definition-- Steps in learning process.– , Learning laws -Theories of learning-Classical Conditioning, Operant conditioning and Watson’s Behaviorism.
- Humanistic Perspective: Motivation- Definition- Psychological basis – classification- Physiological, Psychological and social motives, unconscious, Abraham Maslow’s theory of motivation.
- Social-Cultural Perspective- Albert Bandura Social learning theory

UNIT V Major Psychological Approaches -II

- The Cognitive Perspective–Definition of terms - Cognition, Meta cognition, Intelligence, Intelligence Quotient (IQ) and Emotional Intelligence.
 - Assessment of Intelligence - Verbal and nonverbal tests-classification of children based on intelligence-extremities of intelligence- sub normal and the gifted.
- Theories of Cognition - Piaget’s Cognitive Development Theory – Four major stages- Different Intelligences of Gardner’s Multiple Intelligence theory .
- Trait Perspective – Type theory of Sheldon, and Trait theories of Personality -Big Five Factor Theory.

PRACTICALS

1. Methods of studying child / Human Behaviour-Observation / Interview schedules –
2. Assessment of Perception-Muller Iyer illusion Experiment
3. Memory Recognition Test
4. Assessment of Interest - Thurston’s Interest Schedule / Available tests
5. Assessment of Intelligence-Raven’s progressive Matrices test/ Alexander pass-along test
6. Assessment of personality-Projective tests / Personality Inventory/ Available tests

REFERENCES

1. Baron, R.A. (2001). Psychology (5th edition), Pearson Education Inc., New Delhi.
2. Feldman, R.S. (1997). Essentials of understanding psychology (3rd Edition) Mc Graw- Hill Companies. Inc. New York.
3. Mangal, S.K. (2020). General Psychology revised edition, 2020, Sterling Publishers Pvt. Ltd.
4. Parameswaran, E.G. and Beena, C. (2019). Invitation to psychology, 1st edition, Neel Kamal Publications.
5. Sreevani, R. (2013). Psychology for Nurses, 2nd edition, 2013, Jaypee Brothers Medical Publishers (P) Ltd.

SEMESTER - I
HSC-103- INTERIOR DESIGN AND DECORATION

Theory: 4hrs/week

Practical: 2hrs/week

THEORY

Unit-I Interior Design -Elements & Principles

- Interior Decoration – Meaning, objectives of Interior decoration.
- Good taste – Meaning, development of good taste
- Design – Definition, types of design – structural and decorative designs.
- Elements of Art/design – Line, Form, Texture, Colour, Space, Light
- Principles of art/design – Harmony, proportion, Balance, Emphasis and Rhythm
- Application of elements and principles of design in improving the appearance of home.

Unit- II Interior Design- Colour

- Colour – its importance and effect; Prang colour system – Primary, Secondary and tertiary colours; Dimensions and characteristics of colour;
- Colour schemes and their use in interior decoration;

- Factors affecting colour schemes for different rooms and planning of colour schemes for different areas in the house.

Unit-III Interior Decoration-Flower Arrangement

- Flower Arrangement – Elements and principles of art in flower arrangement.
- Types of flower arrangement – Line, mass, line & mass, miniature etc.
- Styles of flower arrangement – Traditional, oriental (Japanese) and modern.
- Materials and equipment used in flower arrangement.
- Points to be considered while selecting, storing and making of flower arrangements.
- Importance of Flower Arrangement in interior decoration

Unit-IV Interior Decoration - Furniture & Furnishings

- Furniture Arrangement – Selection of furniture and considerations in arranging the
- Lighting – Natural and Artificial Fittings – types and their use in Interior Decoration

Unit-V Interior Decoration -Accessories

- Accessories – Functions, classification, kinds, selection, planning, placement and care of accessories
- Window Treatments – Types of windows and window treatments; Factors to be considered in the selection of curtains and draperies
- Table setting – General rules for setting and laying the table; Types – Formal and Informal table setting, Table manners and etiquette.

PRACTICALS

1. Interior Design – A) Elements of Design, B) Types of Design – Natural, Decorative, Conventional, Geometric and Abstract – Drawing/ painting/clippings from magazines.
2. Application of principles of art in different rooms- a) Harmony b) Balance c) Rhythm
3. d) Emphasis and e) Proportion – Drawing/ painting/clippings from magazines.
4. Colour – Value chart, prang colour chart and six standard colours, Application of colour harmonies in different rooms of the house.
5. Different types of flowers arrangement.
6. Furniture arrangement in different rooms.
7. Table setting – Formal and informal table setting.
8. Window treatments – Types

REFERENCES

1. Bela Bhargava (2016). Family resource Management & Interior Decoration, 1st edition reprint, University Book House Pvt Ltd. Jaipur.
2. Parimalam, Andal, &Premlatha (2015). A Textbook of Interior Decoration, 1steditionreprint, Satish Serial Publishing Home.
3. PremavathySeetharaman&ParveenPannu (2014). Interior Design and Decoration, CBS Publishers.
4. PremlataMullick (2016). Textbook of Home Science, 4th edition , Kalyani Publishers
5. Stella Soundara raj (2009). A Text book of Household Arts, 4th edition, Orient Black Swan Ltd.
6. SubasiniMohapatra (2010). Home Management and Household Economics, 1stedition Kalyani Publishers.
7. Sushma Gupta, Neeru Garg &Renu Saini (2018). Text book of Family Resource Management, Hygiene and Physiology, 11th edition, Kalyani Publishers.
8. Verghese,M.A. &Oagle, M.N. (2005). Home Management, New Age International Publishers.

SEMESTER - II
HSC-103 HOUSING FOR BETTER LIVING

Theory: 4 Hours/Week
Practicals: 2 Hours/Week

THEORY

Unit I: Housing

- Importance and functions of a house; Factors influencing the choice of house.
- Requirements for purchasing land for building a house - Selection of site, soil condition, locality, orientation, sanitary facilities, good neighbour-hood, legal characteristics etc.
- Principles of planning a house – aspect, prospect, privacy, flexibility, roominess, grouping, circulation, sanitation, practical considerations etc

Unit II: House Plans

- Planning of different rooms in the house – veranda, living room, bed room, kitchen etc.
- Kitchen plans – planning of efficient work centres (L shape, U shape, single walled, peninsular shaped kitchens) and storage facilities in kitchen and other rooms.
- House plans for different income groups - High income, Middle income and Low income.
- Advantages and disadvantages of owning and renting a house.

Unit III: Building Materials and Finishes

- Stone –Different types and properties; Clay products – Types; Cement; Mortar; Concrete; Timber; Plywood & related products; Plastics & related products; Paints & related products; Ferrous & nonferrous metals; Gypsum & related products.
- Finishes –Floor, wall and ceiling Finishes – types and materials- Factors affecting in choosing of finishes.

Unit IV: Building Protection

- Dampness Protection – Reasons, Preventive and curative methods of dampness
- Termite Protection – Sources, preventive and curative methods of termite attack
- Fire Protection – Causes of fire, preventive measures and fire resisting construction

- Household cleaning and care – General principles to be followed for cleaning rooms and floors, Equipment and reagents for cleaning rooms and floors.

Unit V: Household Equipment

- Factors to be considered for the selection and purchase of household equipment.
- Construction principles and care of the following equipment
 - Small electrical appliances – mixers, toasters, beaters, iron etc.
 - Large electrical appliances – refrigerator, washing machine, vacuum cleaner, dish washer, electric range etc.
 - Low cost non-electrical appliances for rural areas – hay box, low cost refrigerator, solar cooker etc.
- Points to be considered while operating electrical appliances and safety measures to avoid accidents

PRACTICALS

1. House plan - symbols, site plan, floor plan, elevation, landscape
2. House plans for different income levels - low income, middle income and high income.
3. Kitchen plans- L shape, U shape, broken L, U Shape, peninsular, one walled.
4. Market study on building materials – floor finishes, wall finishes and ceiling finishes.
5. Care and cleaning of objects of different metals and non-metals.
6. Common repairs in the Home – Electrical fuge, Pin plug

REFERENCES

1. PremlataMullick, (2016). Textbook of Home Science, 4th edition,, Kalyani Publishers
2. Varghese&Oagle (2005) Home Management, New Age International Publishers.
3. SubasiniMohapatra (2010).Home Management and Household Economics, Kalyani Publishers.
4. PremavathySeetharaman, ParveenPannu (2005), Interior Design and Decoration, 1st edition, CBS Publishers.
5. Sushma Gupta, Neeru Garg &Renu Saini (2018), Text book of Family Resource Management, Hygiene and Physiology, 11th edition, Kalyani Publishers.
6. Pratap Rao, M. (2012), Interior Design – Principles & Practice, 4th edition, Standard Publishers & Distributors.

SEMESTER - II
HSC-201 – INTRODUCTION TO FOOD SCIENCE

Theory: 4hours/week
Practicals: 2hours/week

THEORY

Unit-I Introduction to Food Science

- Foods -Definition and objectives in the study of foods-functions of foods, group classification and relation to nutrition
- Methods of cooking -Preliminary preparations -Advantages and disadvantages of each method

Unit-II Plant Foods

- Cereals and Millets-structure, Composition and nutritive value, processing-methods of cooking and storage
- Pulses and Legumes- Selection, nutritive value, storage and processing-methods of cooking
- Vegetables and Fruits- Classification,Selection, Nutritional aspects, Pigments, Enzymatic and non-enzymatic browning.
- Nuts and oil seeds- Nutritive value , use in cookery

Unit-III Animal Foods

- Milk and milk Products - nutritive value, use in cookery
- Egg -structure, nutritive value, methods to assess quality of eggs, changes during storage and --use in cookery
- Meat, Poultry, Fish - nutritive value, use in cookery
- Spices and condiments- nutritive value, use in cookery

Unit-IV Food Processing

- Food Preservation-Methods, principles and their applications-high temperature, low temperature, removal of moisture, irradiation and preservatives
- Food additives- types and their role in food processing
- Nutrient Enrichment -- Germination, fermentation, fortification .
- Multipurpose foods, Convenience and Ready to eat foods -Advantages and disadvantages

Unit - V Food Microbiology

- Food Spoilage – Microorganisms causing spoilage – Factors responsible for spoilage and changes brought about in food by microorganisms
- Microorganisms that bring about useful changes in food.
- Microbiology of different foods – Contamination and spoilage of milk, egg, meat, fish, vegetables and fruits
- Food Sanitation and Hygiene – Safe food practices during preparation, storage and serving of food.

PRACTICALS

1. Standardization of weights and measures of various food items.
2. Cereals, pulse and vegetable preparations and calculation of nutritive values of recipe .
3. Milk, meat, egg preparations and calculation of nutritive values of recipes.
4. Demonstration of Drying, Fermentation and germination processing techniques.

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Manay N.Shakuntala&ShadaksharaSwamy.(2008). Foods, Facts and Principles, 3rd edition, New Age International Publishers. .
3. Reddy,S.M.(2015). Basic Food Science & Technology, 1st edition, New Age International Publishers.
4. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra, S. (2010). Basic Food Preparation: A Complete Manual, Fourth Edition, Orient Black Swan Ltd.
5. Sumati R. Mudambi, M.V. Rajagopal. (2006). Food Science, 2nd edition, New Age International Publishers.
6. Srilakshmi, B.(2018). Food Science, 7th edition, New Age International Publishers.
7. Wardlaw MG, Insel PM. (2004). Perspectives in Nutrition, Sixth Edition, Mosby Publishers.

HSC-203–FUNDAMENTALS OF TEXTILES

Theory: 4 hrs/week

Practicals: 2hrs./week

THEORY

Unit-I Introduction to Textiles and Clothing

- Introduction to textiles and clothing- Importance of study of textiles.
- General properties of a Textile Fiber - Primary and Secondary.
- Classification of textile fibers -Natural – manmade, synthetic cellulose- protein synthetic mineral staple and filaments

Unit-II Natural Fibers

- Cellulose fibres- cotton and linen - production, properties, use and care
- Minor cellulose fibres
- Protein fibers- Silk and wool - production, properties, use and care.

Unit-III Synthetic Fibers

- Nylon - Production, properties use and care
- Polyester- Production, properties use and care and
- Acrylic fibres -Production, properties use and care

Unit – IV Mineral Fibers

- Mineral fibres - Fibre glass and Asbestos Production, properties and Uses
- Mixtures and Blends - Importance and advantages of Blending.
- Blends of - Natural cellulose fibers, protein fibers and man made fibers. .

Unit – V Yarns

- Yarns- Types of Yarns - Staple and Filament
- Methods of spinning- Mechanical process
- Methods of spinning - Chemical process.- Wet , Dry, Gel and Melt
- Classification of yarns- simple, novelty- texturized yarns

PRACTICALS

1. Identification and collection of Textile Fibres

- Plant Fibres – Cotton, Linen, Jute
- Animal Fibres – Silk, Wool
- Synthetic Fibres – Polyester, Nylon, Acrylic

2. Identification and collection of Yarns

- Simple Yarns
- Novelty Yarns

3. Tests to identify textile fibers

- Texture
- Microscopic examination and
- Burning test.

REFERENCES

1. Deepali Rastogi and Sheetal Chopra (2017). Textile Science, 1st edition, Orient Black Swan Pvt. Ltd.
2. Kanwar Varinder Pal Singh. (2014). Introduction to Textiles, 1st edition, Kalyani Publishers.
3. Seema Sekhri. (2017). Text book of Fabric – Fundamentals to Finishing , 2nd edition, PHI Learning Pvt. Ltd.

4. Sushma Gupta, NeeruGarg, Renu Saini. (2018). Text book of clothing, textiles and laundry, 8th edition, Kalyani publishers.
5. Vastala, R. (2013) .Text book of Textiles and Clothing, 1st edition, Published by ICAR.

SEMESTER III
HSC-301 – COMMUNITY NUTRITION

Theory: 4Hours/Week
Practicals: 2Hours/Week

THEORY

Unit-I Meal Planning -Nutrition during Pregnancy and Lactation

- Principles of meal Planning, Balanced Diet. Dietary guidelines for Indians
- Nutrition for Adults - Reference man and Reference women- Nutritional requirements for adult man and woman of different physical activities (Sedentary, Moderate and Heavy work).
- Pregnancy-Nutrition and Food requirements- Physiological changes and complications.
- Lactation- Physiology, Nutritional and Food requirements

Unit-II Nutrition during Childhood

- Infancy - Nutritional requirements – Breast feeding and its advantages; Artificial/bottle feeding; Weaning Practices, Supplementary foods.
- Early childhood - Nutritional requirements – RDA, Inculcating healthy eating habits among pre-schoolers
- Late childhood - Nutritional requirements – RDA, Food habits, Importance of breakfast and packed lunch.
- Traditional foods and Junk foods – Impact on health

Unit-III Nutrition during Adolescence and Old age

- **Adolescence**-Nutritional requirements –RDA, Food habits
 - Nutritional problems and Eating Disorders- Anorexia and Bulimia.
- **Geriatric Nutrition**- Physiological changes in elderly
 - Factors affecting food intake
 - Nutrient needs and Requirements
 - Nutrition related problems and their diet management

Unit-IV Nutritional Status Assessment

- Assessment of the Nutritional Status of the Community
- Direct methods-- Anthropometry, Biochemical Analysis, Clinical Examination, Diet Surveys, Functional assessment and Biophysical or Radiological examination.
- Indirect methods - Ecological factors and Vital Health Statistics

Unit –V Nutritional Problems, Programs and Education

- Nutrition problems prevalent in India - Under nutrition – PEM and deficiencies of Vitamin A, Iron and Iodine; Over nutrition
- Community Nutrition Programmes to combat malnutrition - Supplementary Feeding Programmes - ICDS, School lunch programme; Prophylactic Programmes to prevent Vitamin A, Iron, Iodine deficiencies
- Role of National and International Organizations in combating malnutrition - NIN, CFTRI, NNMB, WHO, FAO, CARE and UNICEF
- Nutrition Education – Definition, methods used in nutrition education to improve nutritional and health status of people.

PRACTICALS

1. Planning and preparation of a balanced diet for adult man and women.
2. Planning and preparation of a balanced diet for Pregnant and Nursing mother.
3. Planning and preparation of a balanced diet for a Pre School Child.
4. Planning and preparation of a balanced diet during Adolescence.
5. Use of Anthropometric measurements in assessing the nutritional status.
6. Visit to ICDS and Anganwadi -Observation of a mid-day programme at AnganwadiCenter.
7. Visit to government school-Observation and Planning of School Lunch Programmes

REFERENCES

1. Bamji MS, Krishnaswamy K, BrahmamGNV (2016). “Textbook of Human Nutrition”, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Dietary Guidelines for Indians – A Manual (2011). published by NIN.
3. Food Composition Tables, (2017). published by NIN.
4. PrabhaBisht, Community Nutrition in India, Star Publications, Agra.
5. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation: A Complete Manual, Fourth Edition. Orient Black Swan Ltd.

6. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1st edition, Orient Black Swan.
7. Sara Abraham (2016). Nutrition through life cycle, 1st edition, New Age International Publishers.
8. Srilakahsmi, B. (2018). Food Science , 7th edition, New Age International (P) Ltd.
9. Srilakahsmi, B. (2018). Nutrition Science, 6th edition, New Age International (P) Ltd.
10. Srilakahsmi, B. (2019). Dietetics, 8th edition, New Age International (P) Ltd.
11. Suryatapa Das (2018). Textbook of Community Nutrition” 3rd edition, Academic Publishers.
12. Swaminadhan, M. (1985). Essentials of Food and Nutrition Volume I and II ”, 2nd edition, The Bangalore Printing and Publishing Co. Ltd., Bangalore

SEMESTER - III

HSC - 302 PRINCIPLES OF GARMENT CONSTRUCTION

Theory: 4 hrs/week
Practicals: 2hrs/week

THEORY

Unit-I Equipment in Garment Construction

- Equipment- Measuring, Drafting, marking, sewing and finishing equipment.
- Sewing Machine – Parts of sewing machine, Defects and causes, adjustments in sewing machine and care of sewing machine.
- Types of sewing machine- Mechanical , Electronic , Computerized or Automated , Embroidery Machine , Over lock Sewing Machine

Unit – II Body Measurements and Pattern Making

- Recording of body measurements- Importance- Types of measurements – vertical, Horizontal and Girth measurements. Care to be taken in body measurements.
- Pattern making- Methods of pattern making -Drafting, draping and flat pattern making,
- Drafting – Tools for drafting- Information to be recorded on the draft – Points to be kept in mind while drafting and advantage of drafting
- Paper Patterns – Advantages, and content of paper patterns

Unit – III Estimation and Preparation of the Fabric and Pattern Layout

- Estimation of fabric for different garments.
- Importance of grain in fabric for cutting and garment construction.

- Steps in Preparation of fabric for cutting
- Pattern Layout – Importance, precautions, guidelines and care to be taken in pattern lay out for asymmetric, bold, striped checked designs etc.,
- Fabric Cutting – Guidelines to cut out pattern pieces,

UNIT –IV Garment Components

- Necklines – Types of necklines.
- Collars-Factors in designing collar styles. shapes and kinds of collars.
- Sleeves – Categories and styles of sleeves.
- Yokes – Factors for selection of yokes design and types of yokes.

Unit-V Garment Fitting

- Elements of fit – grain, set, line, balance and ease
- Characteristics of well finished garment
- Readymade garments – Selection and examination for quality, fitting and shape
- Tailor made and Homemade garments – examination for fitting and shape
- Comparison of readymade, tailor and homemade garments
- Common fitting problems and remedies for garments

PRACTICALS

1. Basic Stitches – Temporary, permanent and neat ending finishes.
2. Seam and seam finishes.
3. Neckline finishes- Bias , Binding and shaped finishing.
4. Plackets – Continuous bound and two piece plackets.
5. Sleeves- Plain , Puff and bell sleeve.
6. Introducing fullness - Darts, tucks , gathers and pleats.
7. Fasteners- Hook and Eye, press buttons, button and button hole.
8. Drafting and construction of saree petti coat
9. Drafting and construction of frock.

REFERENCES

1. ManmeetSodhia. (2005). Dress Designing, 1st edition, Kalyani Publishers.
2. Mary Mathews (2001). Practical clothing construction part I &II Designing drafting & tailoring, Cosmic Press, chennai.
3. Pooja Khurana& Monika Sethi (2017). Introduction to Fashion Technology, 2nd edition, 2017, Fire Well Media.
4. PremalataMullick. (2019).Garment Fabrication and Designing, 1stedition ,Kalyani Publishers.
5. PremlataMullick(2010). Garment Construction Skills,1st edition, Kalyani Publisher
6. Sumathi, G.J.(2002) . Elements of Fashion & Apparel Design, 1st edition New Age International (P) Ltd.
7. Sushma Gupta, NeeruGarg, Renu Saini. (2018). Text book of clothing, textiles and laundry, 8th edition, Kalyani publishers.

SEMESTER - III
HSC-303 CHILD DEVELOPMENT

Theory: 4hrs/week
Practicals: 2hrs/week

THEORY

Unit I Introduction to Growth and Development

- Understanding the terms Child, Growth, Development, Child Development, Human Development, and Developmental tasks.
- Principles of Child Development and Factors influencing growth and Development of Children.
- Determinants of Development - Heredity Vs Environment - Maturation Vs Learning
- Stages of Development across life span and domains of development.

Unit II Pre-natal and Early Years of Development

- Stages of Pre-natal development - Physical and Psychological care during pregnancy- - Complications during pregnancy.
- Stages of birth and Types of Birth
- Infancy – Characteristics -Physical proportions, Physiological functions, Motor activities.
- Babyhood, -Developmental Tasks and Characteristics, Physical-motor development, Cognitive development-language, Socio-emotional development.

Unit III Development during Early and Late Childhood

- Early Childhood Period –Characteristics -Physical, Emotional, Social and Cognitive development-Social stages in play .
- Late Childhood Period-Characteristics -Physical, Emotional, Social and Cognitive development.

Unit IV Children with Special Needs

- Definition of childhood disabilities – General Causative factors
- Classification of childhood disabilities –Definition and characteristics of Auditory Challenge, Intellectual Challenge, Developmental Challenge and Learning Disability among children-
- Gifted Children –Definition and characteristics
- Importance of Early Identification and special education

Unit V Child Rearing Practices and Behaviour Problems among Children

- Parenting Styles- -Types of Discipline- Authoritarian, Authoritative and Permissive styles- Influence of child rearing practices on child's Behaviour.

- Behavioral Problems-Definition- Common Behaviour problems - Thumb sucking, enuresis, temper tantrums, destructiveness- Early identification and Referral.
- Juvenile delinquency.-Definition and Causative factors

PRACTICALS

1. Observation of characteristics of an infant
2. Observation of different Developments of pre-school children-Physical, language, Concept development
3. Assessment of social Development among elementary school children
4. Visit to local Special schools for children with disabilities-Taking Case studies
5. Identification of Children with Behaviour problems using a Check List

REFERENCES

1. Berk, L. E. (2007). Child Development. Prentice-Hall of India Pvt.Ltd, New Delhi.
2. Feldman, R.S. (2011).Understanding Psychology, Tenth Edition.TataMCGraw Hill Education Private Limited, McGraw- Hill, New Delhi.
3. Hallahan, D.P. and Kauffman, J.M. (1991). Introduction to exceptional children. 5th ed. Allyn and Bacon, Boston.
4. Hurlock – E.B. (1990) Child Development , Tata McGraw Hill Company Ltd, New York. McGraw- Hill, New Delhi.
5. Rozario, J. and Karanth, P. (2003). Learning disability in India. Sage publication, New Delhi.
6. Santrock, J. W. (2013). Child Development.Tata McGraw Hill Company Ltd, New Delhi.
7. Singh, A. (Ed).(2015). Foundations of Human Development: A life span approach. Tata McGrawHill ,New Delhi.
8. Prasad, J. and Prakash, R. (1996). Education of handicapped children, problems and solution. Kanishka publication distribution. New Delhi.

SEMESTER - IV
HSC-401 - THERAPEUTIC NUTRITION

Theory: 4hrs/week
Practicals: 2hrs/week

THEORY

Unit -I Introduction to Therapeutic Nutrition

- Therapeutic Nutrition – Purpose of Diet Therapy, Therapeutic adaptation of normal diets - liquid, soft and special feeding methods, pre- and post operative diets.
- Dietitian – Roles and responsibilities, Diet counselling, follow up and patient education.

Unit -II Malnutrition and Fevers

- Fevers – Acute and Chronic fevers – Typhoid, T.B. – Causes, symptoms and dietary management
- Under weight, Overweight and Obesity – Causes, assessment, symptoms and dietary management and complications

Unit -III Gastrointestinal and Liver Diseases

- Gastrointestinal Diseases - Dyspepsia, Peptic ulcer, Diarrhoea, Constipation and Malabsorption Syndrome – Steatorrhea, Celiac disease and Tropical Sprue – Causes, symptoms and dietary management
- Liver diseases – Hepatitis, Cirrhosis of liver - Causes, symptoms and dietary management

Unit -IV Cardio-vascular and Renal Diseases

- Cardio-Vascular Diseases – Role of fat in the development of Atherosclerosis, Hypertension - Causes, symptoms and dietary management
- Kidney disease – Nephritis, Nephrosis, Renal Failure, and Renal calculi - Causes, symptoms and dietary management

Unit -V Diabetes and Cancer

- Diabetes Mellitus - Classification, causes, symptoms,
- Tests for detection of Diabetes Mellitus , Dietary management- and complications
- Cancer –Carcinogenic process-Classification, symptoms,
- Risk factors-genetic and environmental.
- Nutrients and cancer- Dietary guidelines for prevention of cancer

PRACTICALS

Planning and preparation of the following diets

1. Preparation of modified diets-Liquid and Soft diets.
2. Planning and preparation of diet in fevers – Typhoid and T.B.
3. Planning and preparation of diets for Underweight and Obesity.
2. Planning and preparation of diet in diseases of Gastrointestinal System – Peptic Ulcer, Viral Hepatitis
3. Planning and preparation of diet in Cardio-Vascular diseases – Atherosclerosis and Hypertension

4. Planning and preparation of diet in Kidney diseases – Nephritis
5. Planning and preparation of diet in Diabetes Mellitus

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahman GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). “The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt. Ltd.
3. NIN. (2017). Food Composition Tables , National Institute of Nutrition, Hyderabad.
4. Srilakshmi, B. (2019).Dietetics , 8th edition, New Age International Publishers.
5. Srilakshmi, B. (2018). Nutrition Science , 6th edition, New Age International Publishers.
6. Sumati R. Mudambi,.Rajagopal, M.V.(2012). Fundamentals of Foods, Nutrition and Diet Therapy, 6th edition, New Age International Publishers.
7. Swaminadhan, M., (1988). Essentials of Food and Nutrition, Volume I and II, The Bangalore Printing and Publishing Co. Ltd., Bangalore.
8. Wardlaw MG&Insel PM. (2004). Perspectives in Nutrition, Sixth Edition,

SEMESTER - IV
HSC - 402 FABRIC CONSTRUCTION AND APPAREL CARE

Theory: 4 hrs/week
Practicals: 2hrs/week

THEORY

Unit I Fabric Construction

- Weaving- Introduction, parts of the loom, Steps in weaving.
- Types of weaves - Basic and Decorative weaves.
- Concepts of Grain- fabric count / Thread count, balance, selvedge.

Unit II Knitting and Non-woven fabrics

- Knitting-Definition, classification (weft and warp) - types of knitting ,
- Comparison of Knitting With Weaving – Properties of Knits – use and Care of Knits
- Non-woven Fabrics – Felting, Bonding, Braiding, Knotting, and bonding. Properties of non woven fabrics. Applications of non woven fabrics.

Unit III Finishes - Chemical, Mechanical and functional finishes

- Introduction to finishes- Importance- Kinds of finishing process- Classification
- Chemical finishes. - Bleaching, mercerizing, shrinking, degumming, weighting.
- Mechanical finishes- Tentering, Decating, Calendering, Schreinerizing, Moireing, napping, flocking, Crepe and wrinkled effect, beetling and embossing
- Functional finishes - water repellency, flame proofing, mildew proofing, moth proofing, Antiseptic and Antistatic finishes

Unit IV Clothing Selection and Wardrobe Planning

- Factors affecting selection of clothing.
- Clothing selection- Clothing for specific groups- Infants, children and teenagers.
- Selection of common household linen-towel, table linen and bed sheets.
- Wardrobe planning- Definition- Importance, - Factors and steps for Planning a wardrobe.

Unit V Laundering

- Manual Laundry equipment- Laundry reagents- Drying and Ironing.
- Machine Laundry – Procedure in use of washing machines- Precautions.
- Laundering procedure for cotton and linen, woollens, silk and synthetics,
- Process of Dry cleaning
- Stain removal - principles of stain removal. Removal of different stains

PRACTICALS

1. Identification and preparation of different weaves
2. Identification of thread count of a fabrics
3. Samples of different knits
4. Classify stains and identify the methods of removing stains.
5. Drafting and stitching of salwar.
6. Drafting and stitching of Kameez.

REFERENCES

1. Deepali Rastogi and Sheetal Chopra. (2017). Textile Science” 1st edition, Orient Black Swan Pvt. Ltd.
2. Sushma Gupta, Neeru Garg, Renu Saini (2018). Text book of clothing, textiles and laundry” 8th edition, Kalyani publishers.
3. Seema Sekhri (2017). Text book of Fabric Science – Fundamentals to Finishing, 2nd edition, PHI Learning Pvt. Ltd.
4. Vastala. (2003). Text book of Textiles and Clothing”, 1st edition, Published by ICAR.
5. Kanwar Varinder Pal Singh. (2004). Introduction to Textiles, 1st edition, Kalyani Publishers.
7. Dantyagi. S, (1996). Fundamentals of Textiles and Their Care, 5th edition, Orient Longman Limited.
8. Neomia D’ Souza (1998). Fabric Care, 1st edition, New Age International Publishers

SEMESTER IV

HSC-403 -HUMAN DEVELOPMENT AND FAMILY DYNAMICS

Theory: 4hrs/week

Practicals: 2hrs./week

THEORY

Unit I Introduction and Adolescence

- Introduction : Life span Development Approach- Principles and stages of Human development –Importance of study of Marriage and family dynamics-. Family life cycle stages.
- Adolescence- Definitions by WHO, UNICEF, NCERT,-- Sub divisions –Early and Late Adolescence, Characteristics .
- Early adolescence (10-14 years) –Physical and physiological Changes during puberty for Boys and girls-
- Developments during adolescence- Cognitive, Social and emotional development-Identity formation
- Major concerns during adolescence – Substance abuse, ,Eating disorders , Delinquency Suicidal Ideation etc.- Symptoms and warning signs- Treatment -Use of Counselling.

Unit II Human Development -Young Adult Hood

- Definition, Development tasks, significance of the period, Changing responsibilities
- Adjustments during young adulthood period
- Preparation for Marriage- - Pre-requisites of marriage - Factors to be considered in the choice of marriage partner., modes of mate selection, Self-choice marriage and arranged marriage-Advantages, Dis advantages.
- Pre-marital counselling- Meaning and Need for Pre-marital Counselling.

Unit III Marriage and Adjustments

- Marriage –Definition and Functions, needs and goals . Criteria for successful marriage.
- Values and goals of marriage- Indian context.
- Marriage practices- The traditional, approved, unapproved forms of marriage.-Advantages and disadvantages
- Criteria for successful marriage. -Adjustments in marriage.- In laws, sex adjustment to mate, adjustment to parenthood, and Financial adjustments .Common conflicts between partner and other family members.
- Transition to Parenthood- Factors that influence Planned Parenthood.
- Factors responsible for an increase in the rate of legal marital dissolution- Post- marital counselling.

Unit IV Indian Family and Changing Trends

- Family- Meaning, Definition, functions of family, sociological significance of family.
- Types of Family-Definitions of Joint, Extended, Nuclear Families, Alternate family styles- Modern trends in family –Advantages and disadvantages.
- Changing Indian family structure -factors responsible- Advantages and disadvantages of change in family structure,--impact on Children.
- Problems faced by the modern family- Need for family counselling .

Unit V Human Development - Middle and Late Adulthood

- Middle adulthood - Definition, physical changes -Menopause, health issues, Psychological changes during middle age, coping up strategies., preparation for retirement
- Late adulthood –Sub groups and definitions, Late adulthood & Ageing (beyond 60 years)- Definitions, Characteristics of old age-Physical and physiological changes during old age, cognitive and memory changes.
- Problems of old age and coping up strategies
- Cultural perspective on aging and institutionalization-Indian context

PRACTICALS

1. Study of adolescent adjustment problems
2. Case study of adolescent boy and Girl
3. Identification of Mate selection criteria depicted in Mass media
4. Case study of Married couple-Marital adjustment
5. Case study of elderly man and woman.
6. Visit to counselling centre –Finding problems of adolescents and married Couples

REFERENCES

1. Berk, E. L. (2013). Exploring life span development.3rded. McGraw Hill, New York.
2. Hurlock – E.B. (1990) Child Development MC. Graw Hill Company Ltd, New York.
3. McGraw- Hill, New Delhi.
4. Papalia, D.E. and Olds, SW. (2008). Human development. 11thed. McGraw Hill. New York.

5. ParbatiSahu.(2009). Marriage and Family Relationships, 1st edition, Kalyani publishers
6. Rajammal P Devadasand and Jaya, N..(1984). A Text Book on Child Development, MacMillan India ltd.
7. Santrock, J. W. (2007). A topical approach to life-span development. New Delhi: Tata
8. Singh, A. (Ed).(2015). Foundations of Human Development: A life span approach. New Delhi.
9. Sushila Srivastava and SudhaRani.K. (2014). Text Book of Human Development – A Life Span Developmental Approach” 1st edition, S. Chand & Company Pvt. Ltd.

IV SEMESTER

HSC 404: RESOURCE MANAGEMENT AND FAMILY ECONOMICS

3HOURS/WEEK
14WEEKS/SEMESTER

Objectives

To impart knowledge on resource management concepts.

To improve the students managerial ability

UNIT – 1

Resources – classification and characteristics. Guides to increasing satisfaction. Management – conceptual framework of the homemanagement process. Steps in the management process. Misconceptions and obstacles of management.

UNIT – II

Factors motivating management – values, goals and standards. Interrelationship of management, family values and goals.

UNIT –III

Personal qualities associated with management. Systems approach to management. Decision making-types, steps in the process, methods of resolving conflicts.

UNIT – IV

Family family management - Family income, Family budget, Family financial records, family savings and family investments.

UNIT – V

Time management – time plans, factors to be considered for making a time plan, time management process. Energy management – efforts in household activities, energy costs, fatigue, energy management process. Work simplification: Techniques-Paper & pencil, Classes of change. Cottage stay - History, objectives, planning and organizing resources towards cottage stay.

SEMESTER IV

HSC- 405 –FUNDAMENTALS OF HOME SCIENCE EXTENSION

Theory: 4 hours/week

Practicals: 2 hours/week

THEORY

Unit-I Extension Education

- Meaning, concept, Scope and objectives
- Formal and Non formal Education
- Philosophy and principles of Extension Education
- Role and Qualities of an Extension worker

Unit-II Teaching and Learning Process

- Teaching: Meaning, definition, steps in Teaching
- Learning: Meaning, definition, Elements of Learning Situation
- Learning Situation: Definition, Elements of Learning Situation
- Principles of learning and their Implications for Teaching
- Motivation: Principles of Motivation in Extension
- Classification of motives

Unit-III Community Types and Their Characteristics

- Features of Rural community
- Features of Urban community
- Features of Tribal community

Unit-IV Audio - Visual Aids:

- Audio Visual Aids – Meaning and Classification
- Factors Influencing selection of Audio-Visual Aids
- Principles of Preparing in Planning, Presentation and evaluating in Audio-Visual Aids
- The cone of Experience

Unit-V Communication

- Communication: Meaning, Definition and scope of Communication
- Key Elements in the process of Communication 1. Communicator 2. Messages, 3.Channel 4. Treatment of Messages 5. Audience 6. Audience Response.
- Types of Communication: Verbal, Non Verbal, Small group and Mass Communication.

PRACTICALS

1. Visit to a community/ village to find out the socio economic needs of the people
2. Preparation of Survey Schedule
3. Preparation and display of teaching aids- posters, charts, flash cards
4. Display of bulletin board

REFERENCES

1. Adivi Reddy (1985). Extension Education, Sreelakshmi press, Bapatla,
2. Dahama.O.P.(1981). Extension and Rural welfare, Ram Prasad and Sons Agra Bhopal.
3. Doshi, S.L. (2007). Rural Sociology. Delhi Rawat Publishers.
4. Dubey V,K.Bishnoi, Indira .(2008). Extension Education and Communication 1st edition, New Age International Ltd.
5. Dubey,V.K.. (2009). Extension Education & Communication, New Age International Ltd
6. Indhubala (1980), Gruhavignasastravistarana , Telugu academy text book publications
7. SanthsGovind, G. Tamliselvi And J. Meenainbigai .(2011). Extension Education and Rural Development .Agroblos (India) Chopasani Road Jodhpur- 342002 (Raj.)
8. Shekar Serene & Santosh Ahlawat . (2013).Text book of Home Science Extension Education, 1st edition, Daya Publishing house.
9. Supe, S.V.(1983). An Introduction to Extension Education. Oxford& IBH publishing Co, New Delhi.

SEMESTER IV
HSC - 406 HOME SCIENCE EXTENSION AND RURAL DEVELOPMENT

Theory: 4Hours/Week
Practicals: 2 Hours/Week

THEORY

Unit 1 Program Planning

- Definition, Principles of Program – Planning and objectives in extension
- Steps in Program Planning
- Evaluation: Principles, methods of evaluating individual and group performances.
- Methods to find out felt and unfelt needs of the community.

Unit-II Teaching Methods/Techniques

- Extension Teaching methods –Definition , Functions and Classification of Teaching methods- According to use and form
- Individual methods- Farm and home visits, Telephone calls, Personal letter, Result demonstrations .
- Group methods- Method demonstration, Group meetings/Discussions, Conferences, Field trips etc.
- Mass Methods-Print and electronic media , Internet and Exhibitions
- Factors to be considered in selection and combination of teaching methods

Unit-III Lesson Planning

- Characteristics of good lesson plan - Prerequisite and components of lesson planning.
- Planning lessons for a specific group- Women and Children
- Different topics for lesson plans- SwatchaBharath, Nutrition and health education.

Unit-IV Voluntary Organizations

- Role of Voluntary organizations (Government and Voluntary for the development of people)
- International Agencies – WHO, CARE, UNICEF,
- National and Voluntary Agencies – ICDS, RASS, KVK, DWCRA, MEPMA, PASS

Unit-V Rural Development

- Rural Development- Definition , Scope objectives– Role of Functionaries
- Panchayat Raj Systems in India (brief)
 - Meaning, Definition, Democratic Decentralization
 - Five tier system of Panchayat Raj-Village Panchayath –Functions

- Mandal Parishath- Seven Committees (Planning, Production etc.,)Functions
- ZillaParishath- Commitees, Functions- District, State and central level
- Extension organization in Panchayath raj set-up
- Concept of Welfare State, Directive Principles

PRACTICALS

1. Plan an activity to create awareness among women and children of community surveyed according to their needs and interest - Lecture cum group discussion
2. Field Visits- Mandal Office, ICDS, MahilaPranganam, PASS organization
3. Rural development, need based group project work.

REFERENCES

1. A guide book for Anganwadi workers. Published by the department of women & child development. Ministry of Human resource development. Government of India.
2. Doshi, S.L. (2007). Rural Sociology. Delhi Rawat Publishers
3. Dahama.O.P .(1981). Extension and Rural welfare, Ram Prasad and Sons Agra Bhopal.
4. Indhubala9 1980), Gruhavignasastravistarana , Telugu academy text book publications
5. Adivi Reddy (1985). ExtensionEducation, Sreelakshmi press, Bapla,
6. Dubey,V.K.. (2009). Extension Education & Communication, New Age International Ltd
7. SanthsGovind, G. Tamliselvi And J. Meenainbigai .(2011). Extension Education and Rural Development .Agroblos (India) Chopasani Road Jodhpur- 342002 (Raj.)

V SEMESTER

HSC 501: Diet and Nutrition Counseling

UNIT-1 Introduction to Dietitian and IDA

- Dietician – Definition and Educational qualification
- Types of Dietician – Clinical, academic, research, specific, food service, public/ Community, industrial, consultant, sports, business etc.
- Qualities, Role and responsibilities of Dietician
- IDA – Objectives, membership; Registered Dietician – eligibility for R.D. exam

UNIT-2 Diet Counseling/ Nutrition Care Process (NCP)

- Diet Counseling/ Nutrition Care Process (NCP) – Definition, importance, purposes and ethical principles
- Steps in Diet counseling Process; Documentation – SOAP
- Counseling Skills for a Dietitian; Tools of Dietitian; Guidelines for effective Counseling

UNIT-3 Counseling Approaches

- Counselling Approaches – Meaning, Developing a counselling approach
- Different Counselling Approaches – Psychoanalytical, behavioural, humanistic, Patient centered GALIDRAA approaches etc.

UNIT-4 Nutrition Education

- Nutrition Education – Meaning and importance,
- Teaching Methods and aids used for Nutrition Education in the Community Teaching Methods – Lecture, Group discussion, Role Play, Storytelling, Demonstrations, Nutrition Exhibition, Marathon race etc.
- Teaching Aids – Posters, pictures, models, charts, flash cards etc.
- Teaching Materials for patients – Models, pamphlets, leaflets, booklets etc.

UNIT-5 Use of Modern Technology in Diet Counseling

- Use of Computers in Diet Counselling and Nutrition Education
- Use of Computer Applications and Mobile Applications in Diet Counselling and Nutrition Education; Computer and mobile applications available for Diet Counselling
- Pre requisites for setting up a Diet Counseling Center

Practical syllabus

1. Introduction to diet counseling process
2. Visit to dietary department of a hospital/ diet clinic
3. Establishing rapport with the patients
4. Assessment of nutritional status and nutritional needs of patients
5. Planning and preparation of teaching material to counsel the patients with different disease conditions
6. Practical exercise on patient counseling in diet counseling centre.
7. Selection of patients and collection of data
8. Counseling the patients and recommendation for therapeutic modification of the diet
9. Follow up of case study of the patient and presentation of results of case study
10. Application of modern technology in diet counseling

References

1. Srilakshmi, B. "Dietetics", 8th edition, 2018, New Age International Publishes, New Delhi
2. IDA, Clinical Dietetics Manual, 2018, 2nd edition Elite Publishing House New Delhi
3. Corinne H. Robinson, Marilyn R. Lawler, "Normal & Therapeutic Nutrition" 17th edition 1986
4. Shubangini A Joshi, "Nutrition & Dietetics" 5th edition, 2022, McGraw hill Education India Pvt. Ltd.
5. Judy Gable "Counselling Skills for Dietitians" 2nd edition, 2007, Black Well Publishing Ltd, Oxford, UK.
6. "Clinical and Therapeutic Nutrition M.Sc." published by directorate of Distance Education, Swami Vivekanand Subharti University, Meerut, U.P.
7. Linda Snetselaar "Nutrition Counselling Skills for the Nutrition Care Process" 4th edition, 2021, Jane and Bartlett Publishers, London.

V SEMESTER

HSC502: Hospital Food Service management

UNIT-1 Introduction to Food Service in Hospitals

- Food Service in Hospitals – Importance
- Role and functions of Dietitian in Food Service
- Management in Food Service – Principles, functions and tools of management
- Organizational chart of Food Service Team in Hospital

UNIT-2: Physical Requirements

- Kitchen – Physical facilities, layout, factors affecting working performance
- Storage Area – Types of storage, sanitary measures, safety and storage of food materials
- Equipment required for Hospital Food Service with reference to food storage, Preparation, holding and service – Classification and selection

UNIT-3 Food Material Management and Food Production

- Purchasing – Methods of purchasing foods
- Receiving and storing of food materials
- Menu planning for patients – types of menus and diets
- Food Production – Methods of preparing food; Safe food handling practices
Different Methods of holding foods for service

UNIT-4 Food Service in Hospital-Styles and Services

- Food Service Styles and Food Service Systems
- Food Service Manager/Director – Leadership and managerial abilities
- Role, duties, qualities and skills of successful food service manager

UNIT-5 Dietary Accounting and Book Keeping

- Cost concept – Components, Factors responsible for losses and Cost control
- Accounting–Definition, Book of Accounts –Cash book, Purchase book, Sales book, Purchases return book, Sales return book and Journal, regular audit and logbooks.

Practical Syllabus

1. Introduction to Food Service Management in Hospital
2. Visit to Govt. hospital to observe kitchen layout, equipment, food production and service
3. Visit to a corporate hospital to observe kitchen layout, equipment, food production and Service
4. Organization chart and identification of duties in a hospital
5. Plan menus for different disease conditions
6. Purchasing methods for food items
7. Calculation of food cost
8. Records maintained in a dietary department
9. Planning of kitchen layouts
10. Comparative study of Government and Corporate Hospitals in providing food service to the Patient

References

1. Mohini Sethi & Surjeet Mahan “Catering Management-An Integrated Approach”, 3rd edition, 2015, New Age International Publishers, New Delhi.
2. Mohini Sethi, “Institutional Food Management”, 2nd edition, 2016, New Age International Publishers, New Delhi.
3. R. Singaravelavan, “Food and Beverage Service” 2nd edition, 2016, Oxford University Press, India
4. “Food Service Management”, published by Directorate of Distance Education, Alagappa University, Karaikudi.
5. Ruby P. Puckett “Food Service Manual for Health Care Institutions”, 3rd edition, 2004, Publishd by Jossey-Bass, a Wiley Imprint, San Francisco.
6. “Entrepreneurship and Food Service management”, 2017, IGNOU Self Study Material.

HSC 503: A-Methods and Materials for Teaching Pre-school Children

UNIT-1 Pre-school Education-Methods

- Nomenclature of Pre-schools in Indian context- Nursery, Kindergarten, Early Childhood Centres and Anganwadi Centre.
- Expansion from ECE to ECCE to ECD.
- Important Methods- Friedrich Froebel- Maria Montessori, John Dewey- Mahatma Gandhi, Giju bhai Badheka, Tarabai Modak, and Rabindranath Tagore.

UNIT-2 Readiness Activities and Materials

- Different Activities for promoting all round development of pre-school children-
- Readiness activities- Pre reading, pre writing and pre- mathematical concepts- Materials to teach readiness activities
- Role of teacher

UNIT-3 Creative Activities and Materials

- Creative activities- Definition of creativity- Importance
- Different creative activities- Painting, Drawing, Collage, Clay modelling etc.,
- Materials for creative activities
- Role of teacher

UNIT-4 Activities for Language Development and Materials -I

- Language development-Importance during early years
- Activities for language development- Informal talk and storytelling
- Selection of stories
- Techniques of story telling
- Materials for story telling
- Role of Teacher

UNIT-5 Activities for Language Development and Materials-II

- Music- Importance for pre-school children
- Activities for Language Development -Rhymes -Selection of Rhymes for different age groups-Indigenous materials for music and Rhyme singing -Role of teacher
- Dramatization-Importance in promotion of language-Materials required and Role of teacher.

Practical Syllabus

1. Developing worksheets to teach readiness concepts
2. Study and observation of different techniques of story telling
3. Developing stories appropriate for young children
4. Preparation of audio-visual aids for story telling
5. Study on different methods to foster creativity
6. Preparation of Art file appropriate for young children
7. Preparation of simple musical instrument with indigenous materials.
8. Developing rhymes appropriate for young children.

References:

1. Contractor, M. (1984). Creative drama and puppetry in education. National Book Trust of India, Delhi.
2. Hendrick, J. (1980). Total Learning for the Whole Child. The C V Mosby, St. Louis.
3. Murlidharan, R. and Asthana, S. (1991). Stimulation activities for young children. NCERT, New Delhi.
4. Swaminathan, M. (1984). Play activities for young children, UNICEF, New Delhi. Robinson, H. (1983). Exploring teaching. Allyn and Bacon, London.

HSC 504: IEC MATERIALS FOR COMMUNITY DEVELOPMENT

Unit – 1 Concept of IEC Material

- Meaning of Information, Education & Communication
- Importance of IEC material, Principles of IEC material
- Characteristics of Good IEC Materials.
- Qualities of effective IEC material

Unit – 2 Theories and Role of Communication

- Role of IEC material for Community Development
- Role of Communicator in IEC material, Responsibilities of Communicator in IEC material.
- Fundamentals Theories of Mass Communication- Magical Bullet Theory-Two Step Flow Theory-Multistep Flow Theory-uses & gratification theory-Cultivation theory.

Unit – 3 Development of IEC Materials

- Criteria for selecting IEC material
- Guidelines for selecting IEC material
- Different types of IEC materials for Community Development (Flannel graphs, Flash cards, Charts, Posters, Chalk board, Bulletin board, Exhibits, Demonstrations, Dramas, Puppet show)
- Strength and Limitations of Various IEC materials

Unit – 4 USE OF IEC MATERIAL IN PROGRAM PLANNING

- Program planning in Extension using IEC material.
- Criteria for writing project report.
- Steps in program planning
- Principles and methods for evaluating program planning

Unit- 5 IT in IEC

- Meaning of IT, Definition of IT, Scope of IT, Uses of IT in Community Development.
- Software uses in Community Development
- Usage of Digital media in Community Development-Facebook, Power-point, videos, You-tube, Instagram.
- Modern trends of Digital Media in Community Development.

Practical Syllabus

1. Prepare chart for community development on any issue.
2. Prepare poster on any topic for rural Development.
3. Designing layouts for various IEC materials
4. Write script on selected developmental issues for videos, You-tube and Instagram.
5. Plan and perform community development programme using IEC material.
6. Plan and perform community development using digital media.
7. Write project report for the community development program .

REFERENCES

1. Enderson (1972): Introduction to communication theories and practices, Cummings publishing house, California
2. Bernice Hurst (1996) : The handbook of communication skills, Kogan Page Limited, London.
3. Chandra A, Shah A, Joshi U (1989) : Fundamentals of teaching home science, Sterling publishers, New Delhi
4. Wittich and Schuller (1967) : Audio visual materials, Havper& Row publications, London
5. Keval Kumar (2010) : Mass communication in India, Jaico publishing house, Ahmedabad

HSC 505: SURFACE ORNAMENTATION FOR INTERIORS

SYLLABUS - THEORY

Unit – 1 Factors influencing interior ornamentation decisions – principles of design, family needs and preferences, climatic conditions, availability of materials in the market, financial limits

Unit- 2 Window and Door ornamentation – types of doors and windows, types of curtains and draperies; hardware fittings for window treatment – pelmets, valence, rods, hooks

Unit – 3 Lighting in interiors – types, selection, types of fixtures, lighting requirement for different activities/areas in interiors

Unit – 4 Landscape gardens – importance, types of gardens, layout of landscape, components of landscape design; other features – bird house, feeders, kennel house

Unit – 5 Indoor gardening – factors to be considered in selection of plants, basic requirements for maintenance of indoor gardens – temperature, light, water, air, nutrients and space, garden tools and equipment; Bonsai – techniques and styles, terrarium – concept and functions

Practical Syllabus

1. Survey to know availability of lighting fixtures in local market
2. Survey to know the availability and cost of curtains and draperies materials in local market. Preparation of a sample material index
3. Planning for a landscape garden layout for a residential building and drawing the plan to scale
4. Visit to local public/corporate buildings to observe the landscape layout and to prepare a report
5. Preparation of runner using patchwork technique
6. Preparation of table mats using quilting technique
7. Preparation of coasters using braiding technique
8. Traditional floor decoration – Muggulu, Rangoli, flower carpet
9. Preparation of artificial flowers using paper/fabric/stockings.

REFERENCES

1. Premavathy Seetharaman & Parveen Pannu “Interior Design and Decoration”
2. Satish chandra Agarwala & Nishant Chandra Agarwala “Interior Decoration”
3. Pratap Rao M “Interior Design”

UNIT - I Value Addition to textiles – Introduction, History of surface enrichment, different techniques/materials used in India in earlier periods, Significance.

UNIT – II Embroideries of India I – Danka, Gota Patti, Heer Bharat, Soof Embroidery. Ari work – Place of origin, Description of method used, typical designs and materials used, Present status- Availability and design features.

UNIT – III Embroideries of India II – Zardosi, Parsi embroidery, Chikankari, Chamba Rumal – Place of origin, Description of method used, typical designs and materials used, Present status – Availability and Design features

UNIT- IV Value Addition through other methods:

With Fabric – Smocking, Patch work, Quilting, Cording – Description of method, Common designs used, Use.

With Thread, Beads, Sequins etc. – Drawn thread work, Lace – Description of method, Common designs used, Use.

UNIT – V Setting Up a Surface Ornamentation Enterprise- Steps to establish a unit, Skills required, Basic requirements to start- Materials, Finance, Personnel- Estimation and Preparation of Feasibility Report.

Practical Syllabus

1. Essentials of Surface ornamentation
 - a. Design modification, placement and transfer
 - b. Design enlargement and reduction
2. Value addition to Textiles - Embroidery - Basic and Decorative Embroidery Stitches - preparation of samples:
 - a. Hand Embroidery – Five samples
 - b. Machine embroidery – Five samples
3. Trimmings and decorations – Lace and Fabric ribbons
4. Ornamentation with colours - Painting and Printing – Block printing, Stencil printing – on stole/ table cloth/ runner
5. Ornamentation with Fabric -Applique, Patch work, Quilting
6. Product development - Home decor Items /Accessories using embroidery or fabric.
7. Decorative trimmings – Visit to a local outlet to understand
 - a. Ari work with bead, sequin, mirror.
 - b. Zardosi border
 - c. Trims and other decorative items: shells, beads, stones, buttons, cords
 - d. Other techniques: Layering. Cording, weaving, draw thread
8. Ornamentation with fabric discards (Optional)
 - a. Patch worked Mask
 - b. Quilted Pouch /Bag
 - c. Smocked Yoke/ Sleeve

Reference

1. Abling, B., (2006), Marker rendering for fashion, accessories and home fashions, Fairchild publications, New York.
2. Abling, B., (2003), The Fairchild Encyclopedia of fashion accessories, Fairchild publications, New York.
3. Celia S., (2004), Know your fashion accessories, Fairchild publications, New York.
4. Hideaki, C., (1992), Colour Harmony-a guide to creative colour combinations, Rockport publishers, London.
5. McCall's (1982). McCall's Big Book of Needlecrafts. Chilton Book Company. Randnon, Pennsylvania. USA.
6. Readers digest complete Guide to Needle Work (1979), The Readers Digest Association, New York, and Montreal.
7. Shenai, V.A. (1981), History of Textile Design. Sevak Publication, Mumbai.
8. Skull J., (1988), Key terms in art craft and design, El brook press, Australia.

SYLLABUS-2022-2023

B. Vocational Course

CLINICAL AND AQUA LAB TECHNOLOGY

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.

w.e.f 2022-2023 batch

CH.S.D.St. Theresa's Autonomous College for Women, Eluru.

B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY-2022-2023

I Semester: 1- Biology of Fin Fish & Shell Fish

2- Principles of Aquaculture

3- Aquatic Ecology and Toxicology

II Semester: 4- Fresh water, Brackish Water & Maricultures

5- Fish Nutrition

6-: Fish Pathology

III Semester: 7- Human Anatomy

8- Physiology

9- Clinical Laboratory Practices

IV Semester: 10- pathology -I

11- Microbiology I

12- Immunology I

13. Biochemistry I
14. Hatchery Management
15. Ornamental Fish Keeping

V Semester:

- 16- First Aid
- 17-Microbiology -II
- 18- Immunology II
- 19.Haematology
20. Post Harvest Technology
- 21.Aquaculture Extension and Economics

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY 2022-2023
I Semester: CALT001- BIOLOGY OF FIN FISH & SHELL FISH

UNIT – I:

1.General characters of Fishes

2. Classification of fishes up to sub class level with examples.

Practical- Identification of Fresh water fishes, Brackish and marine fishes

UNIT – II :

1.Basic fish Anatomy: Type study of bony fish. Ex: Carp.: Morphology, Digestive system, Respiratory system, Circulatory system, Urinogenital , Nervous system, Reproductive system,

2.Development and Life cycle, Endocrine system.

Practical- Dissection of fish : Digestive system, Swim bladder, Pitutary gland,

Observation of visceral organs in carp fish, Morphometric and meristic characters of fish,

Estimation of length - weight relation in fish.

UNIT – III

1.Food & Feeding habits in fishes

2.Scales and Fins in Fishes

Practical-Examination of gut contents to determine whether the concern fish is a plankton feeder, herbivore, omnivore or carnivore or a detritus feeder.

Practical-Mounting of Placoid scale, Age determination through scales

UNIT – IV

1.External characters and general organization of Prawn

2.Sense organs of Prawn (Eye, Statocyst)

Practical: Dissection of Prawn-Appendages, Identification of Prawns,

UNIT – V

1.External Characters and General Organization of Crab

2. External Characters and General Organization Lobsters

Practical- Identification, crab and lobsters

Field work :

1.visit to nearby fish landing centers and hatcheries to get acquainted with the typical fish and fishery of the area.

2. Internship in reputed Aqua lab and submission of the Report.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY 2022-2023
I Semester: 2- PRINCIPLES OF AQUACULTURE

Unit – I:

1. Significance and History of Aquaculture
2. Present status of Aquaculture-Global and National Scenario

Unit – II

1. Concept of Monoculture, Polyculture, and Integrated fish farming
 2. Culture systems: Ponds, Raceways, Cages, Pens, Rafts and water recirculation systems
 3. Culture practices :Traditional, extensive, modified extensive, semi-intensive and intensive cultures
- Practical: Observation of Culture practices

Unit – III

1. Criteria for the selection of site for Aqua farms
 2. Design and construction of an Ideal Pond
- Practical: Design and Observation of construction of Pond

Unit:IV

- 1.Types of Ponds: Head Pond, Hatchery, Nursery Pond, Rearing Pond, Stocking Pond, Production
- Practical: Observation of Various types of Ponds

Unit – V

1. Pre-stocking management (Dewatering, drying, ploughing/desilting; Predators, weeds and algal blooms and their control, Liming and fertilization)
 2. Stocking management (Stocking density and stocking)
 3. Post stocking management (Feeding, water quality, growth and health care; and Harvesting of ponds) of Nursery ponds, Rearing ponds and Stocking ponds
- Practical: Farm Equipment/Instruments: Pumps, Aerators, Secchi disc, cast net, hand net, gill net, Feeding boat

Field work :

1. visit to nearby fish landing centers and hatcheries to get acquainted with the typical fish and fishery of the area.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY- 2022-2023
I Semester, CALT003- AQUATIC ECOLOGY & TOXICOLOGY

UNIT-I

1. Structure and components of Pond Ecosystem,
 2. Marine Ecosystem,
 3. Primary & secondary production: Food chains, food webs with special reference to pond
- Practical**-Field visit to pond and marine ecosystems

UNIT – II

1. General Introduction and Classification of Plankton
 2. Planktonic adaptations.
 3. Importance of Phytoplankton and Zooplankton with examples
- Practical**- Collection and Identification of plankton

UNIT – III

1. Physical Factors: D.O, PH, Temperature, Salinity and conductivity,
 2. Oxygen depletion Problems –Identification and control mechanisms(aerators)
- Practical**-Estimation of D.O, Temperature, Estimation of Salinity and conductivity in water, PH of water and soil

UNIT IV

1. Chemical Factors: CO_3 , HCO_3 , Total Alkalinity, Ammonia, Nitrites, Hardness
- Practical**-Estimation of CO_3 , Estimation of HCO_3 , Estimation of Total Alkalinity, Estimation of Ammonia, Nitrites, Hardness

UNIT V

1. Water Pollution- Sewage Pollution, COD –BOD treatment , Industrial Pollution, Pesticide Pollution (Bioconcentration, Bioaccumulation, Bio-magnification), Thermal Pollution: Stratification
 2. Environmental Acts –Water act, Environmental protection act
- Practical**-Field visit to Industries

References:

1. Environmental Pollution by Pesticides. 1973, C.A.Edwards, Plenum Press, London/ New York.
2. River Pollution. 1968, KLEIN Volumes 1,2,3, Butter Worths, London.
3. Ecology Pesticides, 1978, A.W.A. Brown, Academic Press, London.
4. Insecticides Action and Metabolism. 1978, R.D. O'Brien, Academic Press, New York.
5. Pesticides in Aquatic Environment. 1978, Mohammad Abdul Quadden Khan, Plenum Press, New York/London.
6. Qualitative Toxicology. 1979, V.A.Filov, John Wiley Sons, New York.
7. Pesticide Residue Management. 1977, D.L. Watson and A.W.A. Brown, Academic press/New York/London.
8. Radiation Bio-physics. 1974, H.L. Andrews, Prentice Hall, Inc., New York, USA.
9. Man and His Environment. 1974, D.Lee and D. Maindad, Academic Press, New York.
10. Water Toxicology. 1971, V.V. Matehev and A.I.Kanaer, Amerind Publishing Co. Pvt. Ltd., New Delhi.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY- 2022-2023
II Semester, 4- FRESH WATER, BRACKISH WATER & MARICULTURES

UNIT-I

1.Major cultivable species for aquaculture: freshwater, brackish water and marine water

2.Fresh water Culture: Culture of Major carp

Practical- Identification of Major cultivable species of Fresh water, Brackish water and Marine water, Field visit to pond and observation of culture process

UNIT – II

1.Cultivable species of Prawns

2. Culture of *Macrobrachium rosenbergi*

3.Organic Vannamei Framing (*Litopenaeus vannamei*)

Practical- Identification of Prawns

UNIT – III

1.Culture of Crab

2.Marine water Culture: Culture of Edible oyster

2.Culture of Pearl oyster

Practical- Observation of Culture Process, Identification of Crab, Edible Oysters, Pinctada

UNIT IV

1.Mixed culture of fish and prawns

2.Culture of ornamental fishes

Practical- culture of Aquarium Fishes

UNIT V

1.Culture of Live food organisms

2.Culture of Spirulina

3.Culture of Sea weeds- Culture Techniques, important by-products

Practical- Collection and Identification of plankton, Weed plants

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY- 2022-2023
II Semester, 5- FISH NUTRITION

UNIT-I

- 1.Basic Principles of Nutrition for Fishes and Shrimps
 - 2.Nutritional Requirements of Fin fish and shell fish
- Practical- Visit to Feed Company

UNIT – II

- 1.Types of Feeds based on farming practices
 - 2.Types of feeds based on source
 - 3.Types of feeds based on the Life cycle
- Practical- Observation types of Feeds

UNIT – III

- 1.Live Foods and their role in Fish and Shrimps
 - 2.Food Supplements-Supplementary feeds
 - 3.Principle foods in artificial diets
- Practical- Observation

UNIT IV

1. Feed additives and Preservatives
 2. Role of probiotics, Immunostimulants
- Practical- culture of Aquarium Fishes

UNIT V

- 1.Feeding strategies: Feeding devices, feeding schedules, ration size
- 2.Feed Formulation, Feed Storage
- 3.Feed evaluation, feed conversion ratio

Practical- Collection and Identification of plankton , Weeds plants

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN, ELURU
I B. Vocational Course- CLINICAL AND AQUA LAB TECHNOLOGY- 2022-2023
II Semester, 6- FISH PATHOLOGY

UNIT:1

- 1.Introduction to Fish Diseases
- 2.Catogiries of Fish Diseases
- 3.Diseases and Environment

UNIT:2

Cause, symptoms and Preventive measures of

- 1.Fungal diseases of Fin FISH
- 2.Fungal diseases of Shell Fish

UNIT: 3

Cause, symptoms and Preventive measures of

- 1.Bacterial diseases of Finfish
- 2.Bacterial diseases of Shell fish

UNIT:4

Cause, symptoms and Preventive measures of

- 1.Viral diseases of Fin Fish
2. Viral diseases of shell fish

UNIT:5

Cause, symptoms and Preventive measures of

- 1.Parasitic diseases in Fin Fish and Shell Fish
- 2.Nutritional Diseases
- 3.Prophylaxis in Aquaculture

CH. S. D. ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN, ELURU
SYLLABUS FOR BACHELOR OF BUSINESS ADMINISTRATION 2022-23
PAPER TITLES & SYLLABUS

<p><u>SEMESTER I</u></p> <p>Part-I</p> <ol style="list-style-type: none"> 1. Communicative English-I 2. Hindi Grammar & Communicative Hindi-I/ Telugu <p>Part-II</p> <ol style="list-style-type: none"> 1. Managerial Economics 2. Management Process 3. Information Technology for Managers 4. Organization Behavior 	<p><u>SEMESTER II</u></p> <p>Part-I</p> <ol style="list-style-type: none"> 1. Communicative English-II 2. Hindi Grammar & Communicative Hindi-II/ Telugu <p>Part II</p> <ol style="list-style-type: none"> 1. Business Environment. 2. Quantitative Techniques for Managers 3. Business Analysis using MS-Excel 4. Accounting for Managers
<p><u>SEMESTER III</u></p> <p>Part-I</p> <ol style="list-style-type: none"> 1. English & Soft Skills – I 2. Basic Knowledge of Italian – I <p>Part-II</p> <ol style="list-style-type: none"> 1. Operations Management 2. Human Resources Management 3. Fundamentals of Web Technologies 4. Event Management 	<p><u>SEMESTER IV</u></p> <p>Part-I</p> <ol style="list-style-type: none"> 1. Professional English & Soft Skills – II 2. Basic Knowledge of Italian – II <p>Part-II</p> <ol style="list-style-type: none"> 1. Marketing Management 2. Financial Management 3. Fundamentals of Research Methodology 4. Advanced Web Technologies
<p><u>SEMESTER V</u></p> <ol style="list-style-type: none"> 1. Business law 2. E-Business 3. Taxation-I 4. Photoshop & Internet Applications 5. Management Accounting 6. Financial Markets and Services <p>** BBA Practical</p>	<p><u>SEMESTER VI</u></p> <ol style="list-style-type: none"> 1. Business Strategy 2. International Business 3. Taxation-II 4. Computerized Accounting through Tally <p>Cluster: Marketing Management</p> <ol style="list-style-type: none"> 5. Advertising & Media Management 6. Logistics and Supply Chain Management 7. Project/moocs course/self study(Marketing of Banking Services)

I BBA I SEMESTER SYLLABUS 2022-23

Communication skills – I

Unit I:

Introduction to communication: Meaning, Definitions, Process, Features, Objectives, Essentials of Good Communication, Barriers/ overcoming barriers.

Unit II:

Vocabulary Building: Words-Meaning, Synonyms, Antonyms, One Word Substitutes.

Unit III:

Basics of Grammar: Phrases, Idioms, Articles, Prepositions, Degrees of Comparison.

Unit IV:

Features of Written Correspondence: Types of Business Correspondence – Sales Letter, Claim Letter, Adjustment Letter, Quotation letter, Letter Placing Order.

Unit V:

Resume Writing: Types, Resume Writing for Various Jobs.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

I BBA I SEMESTER SYLLABUS 2022-23
AME-1A: MANAGERIAL ECONOMICS

Course Objective:

Its main objective is to develop students' capacity to analyze the economic environments in which business entities operate and understand how managerial decisions can vary under different constraints that each economic environment places on a manager's pursuit of his/her goals.

Learning Outcome:

- 1) Understand the roles of managers in firms
- 2) Understand the internal and external decisions to be made by managers
- 3) Analyze the demand and supply conditions and assess the position of a company

UNIT – I Introduction: Business – meaning and its importance in the economy; Economic and non- economic activities; economics – definitions – distinction between micro and macro economics. Concept of utility; cardinal and ordinal utility, law of diminishing marginal utility; law of substitution.

UNIT – II Demand and supply: Demand : meaning , types of demand , law of demand , elasticity of demand ; different Types of elasticity of demand – price elasticity , income elasticity , cross elasticity and promotional elasticity –determinants of elasticity of demand – supply – meaning and importance ; law of supply ; consumers surplus.

UNIT - III Production and costs: Concept of production, production function ; distinction between short run and long run ; law of variable proportions ; law of returns to scale - concept of cost of production ; cost function ; costs in short run and long run.

UNIT – IV Market structures and pricing ; Optimizing Theories : Market structures; characteristics - perfect competition –Monopoly –Pricing in various market structures during short run and long run – optimizing theories – Traditional And Modern Theories.

UNIT – V National income Trade cycles and International trade: National income ; different concepts of national income ; measurement of national income ;concept of Trade cycles – different phases of trade cycles ; concept of monetary policy and fiscal policy ; concept of International trade and Balance of payment.

REFERENCE BOOKS:

1. Dean, Joel : Managerial Economics , PHI., New Delhi
2. DN Dwivedi, Managerial Economics, Vikas, ND
3. Trivedi M.L : Managerial Economics, Theory and Applications, TMH, ND
4. Mark Hirschey, Managerial Economics: An Integrative Approach, Cengage, ND
5. Mehta, P.L: Managerial Economics, Text and Csaes, S.Chand &Co
6. Mittal, P.L: Managerial Economics, Text and Csaes, Window, ND
7. Mithani, D.M: Managerial Economics, Theory and Applications, Himalaya Publishing
8. Attmanad; Managerial Economics, Excel Publications
9. G.S. Gupta, Macro Economics; Theory and Applications, Tata McGraw Hill.
10. Dwivedi, D.N. Macro Economics; Theory and Applications, Tata McGraw Hill.

I BBA I SEMESTER SYLLABUS 2022-23

AMP-1A: MANAGEMENT PROCESS

Objective: To equip the Knowledge on the principles of management is essential for all kinds of people in all kinds of organizations. After studying this course, students will be able to have a clear understanding of the managerial functions like planning, organizing, staffing, leading and controlling. Students will also gain some basic knowledge on international aspect of management.

Learning Outcome: To enhance the skills to manage various functions of business organizations in order to provide the professional approach and outlook.

UNIT – I Management: Meaning & Definition - Importance - Role and Responsibilities of Top, Middle and Lower Managers - Functions– Ethics and Corporate Social Responsibility.

UNIT – II Planning: Meaning & Definition - Nature/Features – Purpose/Need - Significance – Steps in Planning Process - Types of planning - Levels of Planning – Limitations of Planning.

UNIT – III Organizing: Meaning & Definition - Nature - Principles– Importance – Process.

Formal & Informal: Formal Organizations – Characteristics – Advantages & Disadvantages - Informal Organizations - Characteristics – Advantages & Disadvantages – Difference between Formal & Informal.

Organizational Structure: Features – Types of Organization/Organizational Structure – Line Organization – Advantages & Disadvantages – Line & Staff Organization - Advantages & Disadvantages – Functional Organization - Advantages & Disadvantages – Divisional Structure - Advantages & Disadvantages.

UNIT – IV Staffing: Meaning & Definition – Elements - Functions.

Directing: Meaning & Definition – Nature – Elements – Purpose– Process– Importance– Requirements for Effective Direction.

UNIT-V Controlling: Meaning & Definition – Nature– Objectives– Importance– Process - Barriers of Control.

Recommended Books:

1. Koontz, H. And Wihrich H, Management, Mc Graw Hill, New York
2. Sharma, Principles of Management, Kalyani Publishers, Hyderabad.
3. Stonner, Freeman, Gilbert, Management, Prentice Hall of India
4. Maital Seshadri, Innovation Management, Sage Publications.
5. Stoner, J, Management, Pearson Education.
6. Stephen P. Robbins, Management, Pearson Publications.
7. Tripathi, Reddy, Principals of Management, Sage Publications.
8. J.S. Chandran, Management: Concept and Strategies, Vikas Publishing House Pvt, Ltd.

I BBA I SEMESTER SYLLABUS 2022-23

AIMP-1A: IT FOR MANAGERS

Objective: To provide an insight into the basic features of Computers and their applications in Managerial Decision-Making.

Learning Outcome: Be able to use and apply current technical concepts and practices in the core information technologies

UNIT – I: IT in the Modern Organization: Basic concepts of information System-Organizational structure and its support. Its support at different organizational levels managing information technology in organizations.
Introduction to computer systems: Introduction to computers –five generations of modern computers-classification of digital computer systems.

UNIT – II: Computer Hardware: Central processing unit (CPU), Control unit (CU), Arithmetic Logic Unit(ALU). Memory: Memory Organization –Random Access Memory(RAM),Dynamic RAM, (DRAM) static RAM(SRAM),Read only memory(ROM) Registers. Factors affecting processor speed –Instruction set, Machine cycle. **Secondary Storage Devices:** Magnetic Tape, Magnetic Disk, Hard Disk, Flexible Disk, Optical Disk. Input Devices: Key Board, Mouse, Trackball, Game controllers, scanners, voice Recognition, web cams, Digital cameras, OCR, OMR, MICR. **Output Devices:** Monitor, CRT Monitor, Flat-Panel Monitors-Printers: Daisy Wheel, Dot Matrix, Ink-Jet printer-plotter, Multimedia projector.

UNIT – III: Computer Software: System Software and Application Software. Operating Systems: Windows Operating System, Mobile device operating systems, and notebook operating systems.

Introduction to MS-Office: Importance, features, system requirements, advantages

MS-Word: Basic editing, formatting, paragraph formatting, borders & sharing tables, lists, page formatting, inserting pictures, clip arts, shapes, mail merge, proofing tools templates & macros.

MS-Excel: worksheet, workbook, templates, entering data, formatting, headers, footers, data analysis, charts, names, filters, sort, validation lists, function, macros

UNIT – IV: MS-Power Point: Creating basic presentation, master view, slide design, building blocks of presentation, themes and styles, charts, graphs and tables, media clips and animation, transition, slide setup, rehearsal, narrations, macros and customization.

Networks: Local area Networks, LAN Topologies, Wide Area Networks(WAN),-value added Networks (VAN) – Virtual private Networks(VPN)

The internet, Intranet and Extranets: the evolution of the internet, services provided by the internet, WORLD WIDE WEB: intranets and extranets.

UNIT – V: New Technologies in Information Technology : Introduction to hyper media, artificial intelligence and business intelligence, Knowledge Discovery in database(KDD):Data Warehouses and data marts. Data Mining and On-line Analytical Processing (OLAP)-Enterprise Resource planning(ERP)-Supply chain Management(SCM),Customer Relationship Management(CRM)-Geographic Information System(GIS).

REFERENCE BOOKS:

- Fundamentals of Computers by Reema Thareja from Oxford University Press
- Micro Soft Office 2010, Bott siechert, EEE
- Introduction to Computers by Norton
- Ms.J.J.L.R.Bharthi Devi, a Text Book on Information Technology, Maruthi Book Depot, Guntur.

IT FOR MANAGERS LAB

1. Create your Bio-Data
2. Create Mail Merge in MS-Word
3. Create a document with Cut, Copy, Paste, font style, color, font size, header and footer.
4. Create a document with picture insertion and effects
5. Create a document for macros.
6. Create a word document using Bullets
7. Create an Excel Worksheet for population table with charts
8. Create an Excel worksheet and sort the data
9. Create a Time Table In MS Word
10. Insert a picture in Excel from a file
11. Mathematical Operations On Excel
12. Creating an document with Shapes and Word Art
13. Insert a chart in Excel
14. Creating a Excel sheet for Date Functions
15. Creating a Excel sheet to Calculate the Retirement date of the Employee.
16. Create a power point presentation with Animation Effects

RECOMMENDED BOOKS:

1. Ms. J.J.L.R. Bharathi Devi, M. Com., MBA., MCA., M.Phil (Computers), M.Phil. (Management)
2. A Text Book on Information Technology, Maruthi Book Depot, Guntur.

I BBA I SEMESTER SYLLABUS 2022-23
AEM-1A: ORGANIZATION BEHAVIOR

Objective: To enable students to synthesize related information and evaluate options for the most logical and optimal solution such that they would be able to predict and control human behaviour and improve results.

Learning Outcome: Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.

Unit-I: Definition, Nature and scope - Focus and Purpose – Need & Importance of organizational behaviour – Framework – Organizational behaviour models.

Unit-II: Personality – Types – Factors influencing personality – Learning – Types of learners – Learning process – Learning theories – Organizational behaviour modification - Management Intervention - Emotions - Emotional Labour – Emotional Intelligence.

Unit-III: Attitudes – Characteristics – Components – Formation – Measurement- Values - Perception – Factors influencing perception – Perceptual process – Interpersonal perception - Motivation – Types –Work Place Ethics.

Unit-IV: Organization structure – Formation – Group dynamics – Group Behavior – Norms – Group decision making techniques – Team building - Interpersonal relations – Communication – Control.

Unit-V: Leadership and Power: Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of Power – Power Centers – Power and Politics.

Reference Books:

1. Stephen P. Robins, Organizational Behavior, PHI Learning/Pearson Education, 2008.
2. Fred Luthans, Organizational Behavior, McGraw Hill, 2001.
3. Schermerhorn, Hunt and Osborn, Organizational behavior, John Wiley, 2008.
4. Udai Pareek, Understanding Organizational Behaviour, Oxford Higher Education, 2004.
5. Mc Shane & Von Glinov, Organizational Behaviour, Tata Mc Graw Hill, 2007.
6. UdaiPareek, Understanding Organizational Behaviour, Oxford Higher Education, 2004.
7. Mc Shane & Von Glinov, Organizational Behaviour, 4th Edition, Tata Mc Graw Hill, 2007.
8. Hellrigan, Slocum and Woodman, Organizational Behavior, Cengage Learning, 2007.
9. Ivancevich, Konopaske&Maheson, Organizational Behaviour & Management, Tata McGraw Hill, 2008.

I BBA II SEMESTER SYLLABUS 2022-23

Communication Skills – II

Unit - I

Business Communication : Memorandum, Notice, Agenda, Minutes, Social Correspondence, Telephone Skills and Electronic mail.

Unit – II

Reading skills: Comprehension of Factual Material, Reading Techniques and Guide lines for Effective Reading.

Unit – III

Spoken Skills: Phonetics – Transcription, Translation, Syllabification, Word Stress and Sentence Stress.

Unit – IV

Dyadic Communication: Everyday conversation and Dialogues on Situations.

Unit – V

Basics of Grammar: Direct and Indirect Speech, Tenses, Active & Passive voice.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

I BBA II SEMESTER SYLLABUS 2022-23

ABE-1B: BUSINESS ENVIRONMENT

Objective: To provide knowledge of the environment in which businesses operate.

Learning Outcome: Define various elements internal as well as external affecting business environment.

UNIT-I: Frame work of Business Environment: Meaning - Definition - Characteristics of Business Environment- Scope - Significance/Importance - Components/factors/Elements influencing Business Environment (Internal & External).

UNIT-II: Components of Macro Environment of Business: Elements of Socio-cultural Environment – Features of Technological Environment – Impacts of Technological Environment on Business- Dimensions of Political Environment – Influence of Political Environment on business.

UNIT-III: Economic Environment of Business: Meaning - Definition – Classification of Economic Environment of Business- Components of Economic Environment of Business – Economic Planning – Introduction – Need & Importance – Essentials – Limitations.

UNIT-IV: Economic System-Meaning-Definition-Basic units of an Economic system-Characteristics of Economic system – Functions of Economic system- Types of Economic system (Socialistic, Capitalistic, Mixed) – Characteristics, Merits & Demerits of Economic system.

UNIT-V: International Business Environment: Introduction- Determinants of the International Business Environment – Importance - Dimensions/Framework - Challenges of International Business Environment.

Recommended Books:

1. Sharma R.K., Gupta Shashi, Kalyani Publishers
2. Dr. Ravindranath Badi, Himalaya Publishing House Pvt.ltd
3. K .V. Sivaiah & V.B.M Das, Indian Industrial Economy , S .Chand & Company , New Delhi.
4. Francis Cherunilam, Business Environment , Himalaya Publications .
5. Suresh Bedi , Business Environment , Excel Books , New Delhi.
6. Chidambaram, Indian Business Environment, Vikas, ND
7. Pandey G.N., Environmental Management, Vikas Publishing House.
8. Sundaram & Black, International Business Environment – The Text and Cases, Prentice Hall of India
9. Gosh PK., Business Environment, Sultan Chand & Sons, ND
10. Daniel John D and Redebough, Lee H., International Business, Addison Wesley India
11. Saleem, Business Environment, Pearson, ND
12. Bhalla, V.K., & S.Sivaramu, International Business Environment and Business, Annual Publications.

I BBA II SEMESTER SYLLABUS 2022-23
AAFM-1B: ACCOUNTING FOR MANAGERS-I

Objective: Understanding Basic Principles of Accounting.

Learning Outcome: Hands on skills in preparing Financial Statements of a Business enterprise

Unit I: Introduction to Accounting

Meaning & Definition of Accounting – Objectives– Principles - Functions– Branches - Advantages– Disadvantages. Few Basic terms (Business Transactions, Debtor, Creditor, Capital, Goods, Assets, Equity, Income, Expenditure, Expense, Drawings, Loss, Turnover, Net worth, Insolvent, Voucher). **(Theory)**
Preparation of Journal and Ledger **(Problems)**

Unit II: Subsidiary Books with special reference to cash book (Single, Double, Triple Column & Analytical Petty cash Book) – **(Problems)**

Unit III: Bank Reconciliation Statement: Meaning - Need - Reasons for difference between cash book and pass book balances - Problems on favorable and over draft balances - Ascertainment of correct cash book balance- Preparation of BRS. **(Problems)**

Unit IV: Trial Balance, Final Accounts:

Trial Balance: Meaning, Objectives, Methods of preparation, Limitations– Preparation of Trail Balance **(Theory) - Trial Balance - (Problems)**

Final Accounts:

Trading Account, Profit & Loss Account and Balance Sheet- Final Accounts of a Sole trader, Manufacturing Account – Trading Account – Profit and Loss account and Balance Sheet – Adjustments **(With Simple Adjustments)**. Green Accounting (Theory only)

Unit V: Depreciation - Meaning – Causes – Objectives - Accounting Treatment - Methods– Straight line Method – Diminishing Balance method - Annuity Method. **(Simple Problems)**

Recommended Books:

1. Accountancy - I - S.P. Jain & K.L Narang Kalyani Publishers
2. Financial Accounting - Dr.V.K.Goyal Excel Books
3. Introduction to Accountancy - T.S.Grewal S.Chand and CO
4. K. Arun Jyothi, A Text Book of Fundamentals of Accounts, Maruthi Publications, Guntur
5. R L Gupta &V K Gupta, Principals and Practices of Accounts, S Chand & Co.
6. S.N Maheswari & V.L.Maheswari, Advanced Accountancy -1, Vikas Publishing House.

I BBA II SEMESTER SYLLABUS 2022-23
AQTM-1B: QUANTITATIVE TECHNIQUES FOR MANAGERS

Objective: To enable the students to develop quantitative analytical skills & application of quantitative techniques to research problem

Learning Outcome: To connect acquired knowledge and skills with practical problems in economic practice.

UNIT – I: INTRODUCTION: Statistics: Meaning, Definition, Functions, Importance and Limitations of Statistics.

Measures Of Central Tendency: Definition of Central Tendency, Objectives of Central Tendency, Characteristics of Central Tendency, Types of Averages – Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode (for Individual, Discrete, Continuous Series) – Properties of Averages and their Applications.

UNIT – II: MEASURES OF DISPERSION: Meaning, Definitions, Objectives of Dispersion, Range Quartile Deviation, Mean Deviation, Standard Deviation - Co-efficient of variation.

UNIT – III: MATRIX: Meaning – Types of Matrices – Matrix Operations (Matrix addition, Matrix Subtraction, Matrix Multiplication) – Matrix Determinants, Minors and Co-factors – Matrix inversion.

UNIT – IV: MEASURES OF CORRELATION AND REGRESSION: Meaning, Definition and use of Correlation-Types of Correlation – Karl Pearson's Correlation Co-efficient-Spearman's Rank correlation – Probable error- Meaning utility of regression analysis- comparison between correlation and regression.

UNIT – V: PROBABILITY: Definition, Concept of discrete probability distribution, Normal Distribution, Use of normal distribution tables.

Recommended Books:

1. Sivayya K.V. and Satya Rao, Business Mathematics, Saradhi publication, Guntur.
2. Sancheti and Kapoor V K, Business Mathematics, Sulthan Chand & Sons, New Delhi.
3. D. N. Elhance: Fundamental of Statistics, Kitab Mahal, Allahabad.
4. Gupta S.C: Fundamentals of Business Statistics, Sultan Chand, New Delhi.
5. Aggarwal, Business Statistics, Kalyani Publishers, Hyderabad.
6. Reddy C R, Business Statistics, Deep&Deep Publications, New Delhi.
7. S.P. Gupta- Statistical Methods for Management
8. CR Kothari- Quantitative Techniques, Vikas, New Delhi

I BBA II SEMESTER SYLLABUS 2022-23
ABAME-1B: BUSINESS ANALYSIS USING MS-EXCEL

Objective: To provide an insight into the basic features of Computers and their applications in Managerial Decision-Making.

Learning Outcome: Students will have a working knowledge of basic functions and formulas in MS Excel.

UNIT – I: Getting Started with Excel

Introducing Excel - Entering and Editing Worksheet Data - Essential Worksheet Operations - Working with Cells and Ranges - Worksheet Formatting – Excel Views and Zooming - Using and Creating Templates - Printing Your Work

UNIT – II: Working with Formulas and Functions

Introducing Formulas and Functions – Mathematical Functions – Logical Functions – Text Functions – Date and Time Functions – Statistical Functions – Financial Functions - Creating Formulas That Look Up Values - Creating Formulas for Financial Applications

Creating Charts and Graphics:

Getting Started Making Charts - Learning Advanced Charting - Visualizing Data Using Conditional Formatting - Enhancing our Work with Pictures and Drawings

UNIT – III: Using Advanced Excel Features

Customizing the Quick Access Toolbar - Using Custom Number Formats - Using Data Validation - Creating drop down list -Worksheet Outlines - Linking and Consolidating Worksheets - Excel and the Internet - Sharing Data with Other Applications - Protecting Your Work – Using Macros for simplifying tasks.

UNIT – IV: Analyzing Data with Excel

Introducing Pivot Tables - Analyzing Data with Pivot Tables - Performing Spreadsheet What-If Analysis - Analyzing Data Using Goal Seek and Solver - Analyzing Data with the Analysis Tool Pak -Practical Examples of Business Reporting - Excel Shortcut Keys.

UNIT – V

Internet Technology

Internet – Networks – LAN/WAN/MAN – Websites – Web Browsers – Opening Web Sites – Searching Websites – Copying Information from the Websites – Saving Images/Videos from Websites – Bookmarking Websites – Downloading Information in PDF/PPT formats – Viewing Google Maps – Using Google Translation tools – Watching/Downloading Videos from YouTube

Email: Creating Email Account - Login/Logout Email – Receiving Mails – Sending Mails – Attaching Documents/Pictures – Searching Mails – Deleting/Moving Mails – Social Networking – Face book and Orkut – Useful websites for business management.

Reference Books:

1. Excel 2010 formulas – John Walkenbach
2. Computer Fundamentals and office Automation tools by Rachhpal Singh
3. Office Automation Tools by Puneet Kumar, Susheel
4. Data Communications and Networks by Godbole from TATA McGRAW HILL
5. Using excel for Business Analysis a guide to financial model fundamentals by Danielle stein fairhurst from Belly
6. Data Analysis for business decisions using Excel by Dr.George Joseth, Dr. Drenjini,Nimitha, Aboobakar, Dr.Smarty P, Mukundan

MS-EXCEL LAB

1.Mathematical functions in excel

2.Logical functions in excel

- 3.Date and time functions in excel
- 4.Statistical functions in excel
- 5.Text functions in excel
- 6.How to insert charts in excel
- 7.Creation of student marks list table
- 8.Creating a drop down list
- 9.Creating charts and graphs
- 10.Creation of pivot table
- 11.Macros in excel
- 12.Goal seek in excel
- 13.Data validation in excel
- 14.Insert a picture in excel
- 15.Financial functions in excel

RECOMMENDED BOOKS:

1. N. V. N. Chary & Lalitha S., Fundamentals of Information Technology, Kalyani Publishers, Hyderabad.
2. Alexi's Leon and Mathews Leon, Fundamentals of Information Technology, Leon Press (2nd Edition)



II BBA III SEMESTER SYLLABUS 2022-23
Professional English & Soft Skills – I

Unit I:

Body Language: Gestures, Facial Expressions, Eye Contact, Appearance, Positive Body Language.

Unit II:

Interpersonal Relationships: Concept & Features, Team Work, Analysis of Strengths & Weakness.

Unit III:

Time Management: Concept, Significance, Aspects & Relevance, Factors Causing Waste of Time.

Unit IV:

Writing Skills Paragraph Writing, Essay Writing, Common Errors, and Abbreviations.

Unit V:

Speaking Skills: Accent and Rhythm in Connected Speech, Intonation.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

II BBA III Semester Syllabus 2022-2023

Basic Knowledge of Italian – I

- Italiano l'alfabeto
- Pronouns
- Articles
- Verbi essere/ Avere
- Forma affermativa/ negative / interrogative
- I numeri in Italiano
- I giorni della settimana
- I mesi dell' anno
- Translations
- Espressioni con il verbo Avere
- Verbo stare
- Exceptions
- Italian words
- Italian vocabulary for professions
- Possessive pronouns
- Familiare Italiano
- This and that
- Salutare
- Colors
- La lancetta dei minuti è lunga e di colore
- How many/ How much
- Italian regular verbs
- Il condizionale presente
- Fare / Andare / Idiomatic expressions with fare
- -Are - Ere - Ire in - Isc
- Presente dei principali verbi irregolari

II BBA III SEMESTER SYLLABUS 2022-23
AHRM-2A: HUMAN RESOURCE MANAGEMENT

Objective: To make the student understand the basic concept and significance of Human Resource Management

Learning Outcome: To impart the skills to manage various functions of Human Resource Management in order to provide the professional approach and outlook

Unit-I: Introduction: Meaning & Definition of Human Resource Management – Nature – Features - Scope– Objectives - Functions – Principles of Human Resource Management.

Unit-II: Human Resource Planning: Meaning & Definition - Characteristics/Features – Reasons for Increasing Focus on HR Planning – Objectives/Purpose/Importance of Human Resource Planning – Principles – Activities of human Resource Planning – Human Resource Planning at Different levels - Types of Human Resource Planning.

Unit-III: Recruitment: Meaning & Definition of Recruitment – Nature/Features– Significance– Objectives - Factors Affecting Recruitment policy – Sources of Recruitment - Methods/Techniques of Recruitment –.

Unit-IV: Selection: Meaning & Definition of Selection – Purpose– Selection procedure - Factors Affecting Selection Decisions – Limitations– Difference between Recruitment & Selection – Selection / Employment tests.

Interview: Meaning & Definition of Interview – Features– Objectives– Types of Interview.

Unit-V: Training: Meaning & Definition of Training – Purpose/Objectives - Areas of Training – Training Process – Training Methods & Techniques.

Development: Meaning & Definition of Development - Objectives– Difference Between Training & Development.

References:

1. DK Tripathi , Human Resource Management; Text & Cases, Wisdom, Delhi
2. P.S. Rao, Essentials of Human Resource Management& IR Himalaya, Mumbai
3. Human Resource Management- Shashi K. Gupta, Rosy Joshi, Kalyani Publishers.
4. D'Enzo, David A., Stephen P. Robbins, and Susan L. Verhulst, Human Resource Management, John Wiley and Sons, NewDelhi.
5. Gomez-Mejia, Luis R., D. B. Balkin, and R. L. Cardy, Managing Human Resources, Prentice Hall, NewJersey.
6. Ian, Beardwell, and Len Holden, Human Resource Management, Prentice Hall.
7. Dessler, Garry, Human Resource Management, Prentice Hall of India. Department of Commerce, University of Delhi 20
8. Saiyadain, Mirza S., Human Resource Management, Tata McGraw-Hill Pub. Co. Ltd., New Delhi.

ADD-ON COURSE
II BBA III SEMESTER SYLLABUS 2022-23
AEM-2A: EVENT MANAGEMENT

Objectives: To provide students with a structured approach to operational and creative fundamentals, from inception to debrief.

Learning Outcome:

- obtain a sense of responsibility for the multi-disciplinary nature of event management
- gain confidence and enjoyment from involvement in the dynamic industry of event management

UNIT:1 Introduction to Event Management & Concept:

Meaning, Definition of Event Management, Size of Events, Types of Events, The Event Theme, Code of Ethics, Developing, Analyzing, Designing & Logistics of Concept.

UNIT:2 Legal Compliance, Marketing & Risk Management:

Relevant Legislation, Liquor Licensing, Federal Trade Commission Act, Stakeholders & official Bodies ,Contracts, Nature & Process of Event Marketing, Promotion, Process of Risk Management.

UNIT: 3 Planning, Staging & Staffing:

Planning Process, Staging: Choosing the Event Site, Developing the Theme, Conducting Rehearsals, Producing Services, Arranging catering, Organizing Accommodations & Managing The Environment, Staffing: Preparing Job Description, Recruitment& Selection, Training Briefing & Managing Volunteers.

UNIT:4 Safety & Security:

Security, Occupational Safety & Health, Incident Reporting, Crowd Management &Evaluation: Plan, Major Risks, Emergency Planning, Implementing Emergency Procedures

UNIT: 5 Monitoring, Control & Evaluation:

Monitoring & Control Systems, Operational Monitoring & control, Evaluation, Careers in Changing Environment-Job Opportunities.

References:

1. Event Management, Lyn Van Der Wagen&Brenda R.Carlos-Perason Publication
2. Event Management by Swarup K. Goyal - Adhyayan Publisher – 2009.
3. Event Management & Public Relations by Savita Mohan - Enkay Publishing House.
4. Event Management: A Blooming Industry and an Eventful Career by Devesh Kishore, Ganga Sagar Singh – Har and Publications Pvt. Ltd.
5. Event Entertainment and Production - Mark Sonder, CSEP, Wiley & Sons, Inc.
6. Special Event Production - Doug Matthews.
7. Fenich, G. Meetings, Expositions, Events, and Conventions: An introduction to the Industry. Pearson Prentice Hall, New Jersey.

II BBA III SEMESTER SYLLABUS 2022-23
AOM-2A: OPERATIONS MANAGEMENT

Objective: to improve students understanding of the concepts, principles, problems, and practices of operations management.

Learning Outcome: Identify and articulate how operations management contributes to the achievement of an organization's strategic objectives.

Unit-I:

Operations management: Introduction of Operation Management – Meaning & Definition of Operation Management – Objectives of Operation Management – Scope of Operation Management –Advantages & Limitations of Operations Management- Interaction of Operations Management with Other Areas – Difference between Manufacturing and Service Operations.

Unit-II:

Plant Location: Meaning of Plant Location – Factors determining Plant Location – Process/Steps in Plant Location Selection – Importance of Plant Location

Plant Layout: Meaning of Plant Layout – Objectives of Plant Layout – Factors influencing Plant Layout – Importance of Plant Layout – Types of Plant Layout: Process Layout, Product Layout, Fixed Position Layout, Combined Layout

Unit-III:

Materials Handling: Meaning & Definition of Materials Handling – Objectives of Materials Handling – Scope of Materials Handling – Factors Affecting Materials Handling – Materials Handling Equipment's: Lifting & Lowering Devices; Transporting Devices; Combination Devices; Storage Devices

Unit-IV:

Job Design: Introduction – Goals of Job Design – Objectives of Job Design – Factors Affecting Job Design – Techniques of Job Design

Work Study: Meaning & Definition of Work Study – Objectives of Work Study – Benefits of Work Study – Procedure of Work Study

Unit-V:

Operations Control: Meaning & Definition of Operations Control – Techniques of Operations Control: Benchmarking, Balanced Score Cards, Network Techniques – Process of Operations Control

References:

1. Russell, Roberta S & Bernard W.Taylor, Operations Management, Pearson, New Delhi, 2004.
2. Chase: Operations Management for Competitive Advantage, Tata McGraw Hill, New Delhi.
3. Buffa, E.S., 'Modern Production Management', New York, John Wiley, 1987.
4. Adam, E.E. and Ebert, R.J, Production and Operations Management, PHI, New Delhi, 1995.
5. Chary, S .N., Production and Operations Management', Tata McGraw Hill, New Delhi 1989

UNIT- I

Introduction to internet concepts:

What is the Internet – History of the Internet – Uses of the Internet – Protocols – Email – World Wide Web – Computers in business – Web Browsers – Web-Page.

UNIT – II

Internet Technologies:

Modem – Internet Addressing – Physical connections – Telephone lines – Internet Explorer – Netscape Navigator – Types of Networks – Protocols – Internet Protocols (IP), TCP, UDP, HTTP, Telnet, POP.

UNIT – III

HTML:

Basic HTML – The document body – Text – Hyperlinks – Lists – Tables, Using Color and Images – Multi media objects - Frames – Forums.

UNIT – IV

DHTML (Dynamic HTML):

Introduction to DHTML – Defining style-sheets – CSS Syntax – CSS colors – Borders – CSS Backgrounds – CSS Margins – CSS Lists – CSS Fonts – CSS Links – CSS Tables – CSS Image Gallery – CSS Forms.

UNIT – V

Java script:

Introduction – Language Elements – Identifiers – Expressions – Java script Keywords – Operators – Statements – Functions – Objects of Java Script – The Window Object – The Document Object – Forms Object – Text Boxes and Text areas – Buttons – Radio Buttons and Check Boxes.

Prescribed Text Books:

- Web Programming Building Internet Applications 2nd Edition by Chris Bates.
- World Wide Web Design with HTML by C Xavier.
- Web Technology 2nd Edition by N. P. Gopalan, J. Akilandeswari.

Reference Books:

- Web Technologies Sammulal Kishor
- Web Technologies Black Book ,Dreamtech publishers

AWTP-2A: FUNDAMENTALS OF WEBTECHNOLOGIES LAB

1. Write HTML code to implement body tag and its attributes
2. Write HTML Program to create a web page using text formatting tags
3. Write HTML code for Escape sequences (or) Special characters
4. Write HTML Program to demonstrate all types of hyperlinks available using <A> tag.
5. Write HTML code for various attributes of marquee tag
6. Write code for Course list in HTML
7. Write HTML code to Frame Set
8. Write HTML code for a table to create 2 columns and 4 rows
9. Write HTML code using Table Tags
10. Write a program to illustrate form controls and many input types
11. Write a program on Java Script operators
12. Write a program on Java Script Functions
13. Write a Java Script program on Sum of two integers
14. Write a program on Window object in Java Script
15. Write a program on Form Object in Java Script

II BBA SEMESTER-IV SYLLABUS 2022-2023

Professional English & Soft Skills – II

Unit – I

Soft Skills: Motivation, Goal Setting, Positive Attitude, Stress Management.

Unit – II

Spoken Skills: Extempore Speech Making, Short Speeches/ Presentations, Interview Skills and Group Discussions.

Unit – III

Written Skills: Report Writing, E-mail and Advertising.

Unit – IV

Information Transfer: Pie Diagrams, Bar Diagrams, Flow Charts, Interpretation of Pictures, Interpretation of Tables.

Unit – V

Vocabulary Building: Words often mis-spelt, Punctuation, Words often Confused.

References

Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, O.U.P, New Delhi, 2011

Kumkum Bharadwaj, *Professional Communication*, I.K. Publishing House, New Delhi, 2008

II BBA SEMESTER-IV SYLLABUS 2022-2023

Basic Knowledge of Italian – II

1. Demonstrative adjectives and pronouns

- This (singular)
- That (singular)
- These (plural)
- Those (plural)

2. Tenses

- Present tense/ simple present tense
- Present perfect tense
- Future tense
- Past tense

3. Gerund form (-ing)

4. Conditional tense

5. Present subjunctive tense

6. "Avere" - verb conjugation table

II BBA IV SEMESTER SYLLABUS 2022-23
AFM-2B: FINANCIAL MANAGEMENT

Course Objectives: To develop critical thinking and problem solving competencies, at both the individual and group levels, of capital budgeting, capital structure, and to apply financial theory to analyze real life situations in an uncertain environment with an incomplete data set.

Learning Outcome: To impart the skills to manage various functions of Financial Management in order to provide the professional approach and outlook.

Unit-I : Financial Management: Nature and scope – Financial goals: profit maximization , wealth maximization ; Financial functions – investment, financing and dividend decisions- Dividend decisions– types of dividend– determinants of dividend policy.

Unit-II :Source of Finance : Classification of Source of Finance – Factors determining the choice of finance - Mid Term Finance - Public deposits – Commercial banks– Lease Financing

Short term Sources; Bank Credit (Loans, Cash, Credit, Overdraft) –Trade Credit –Installment – Credit – Advances – Commercial paper

Long term Sources of Finance – Issue of shares – Equity shares– Preference shares; Types of Preference shares – Difference between Preference shares and Equity shares – Retained Earnings – Debentures – Types of Debentures –Difference between Debentures and shares.

Unit-III: Working capital Management : Working Capital – Meaning – Concept - Permanent working capital – Temporary working capital – Components– Importance– Factors influencing working capital – Adequate & Inadequate working capital – Estimation of required working capital.

Unit-IV: Capital Budgeting: Meaning – Importance – Computation of capital budgeting – Process– Methods; Payback period method, Net present value method, Profitability index method – **(Simple Problems in Payback period method , Net present value method and Profitability index method)**

Unit-V: Capital Structure: Meaning – Importance- features of appropriate capital structure – Capital structure theories – Determinants of capital structure. **(Theory only)**

Recommended Books:

1. Financial Management- P.Viswanadham, Md. Jafrulla, Himalaya Publishing House
2. Financial Management- Khan & Jain, Tata Mc Graw Hill
3. Bhattacharya, Hrishikesh: Working Capital Management: Strategies & Techniques; PHC, New Delhi.
4. Chandra, Prasanna: Financial Management; Tata McGraw Hill, Delhi.
5. Pandey, I.M.: Financial Management, Prentice Hall of India, New Delhi.
6. Khan M.Y. and Jain P.K.: Financial Management; Tata McGraw Hill, Delhi.
7. Vanhorne, J.C.: Financial Management and Policy; Prentice Hall of India, New Delhi.
8. Ravi M Kishore: Fundamentals of Financial Management, Taxman Publications.

II BBA IV SEMESTER SYLLABUS 2022-23
AMM-2B: MARKETING MANAGEMENT

Course objectives: to develop understanding about marketing management concepts and frameworks, and apply these to a new or existing business and to enhance business communication skills required to work effectively with a marketing team.

Learning Outcome: Critically Analyze an Organization's marketing strategies, formulate and assess strategic, operational and tactical marketing decisions

Unit-I: Introduction: Meaning of Market –Definition - Importance - Classification– Meaning & Definition of Marketing – Nature– Scope– Objectives – Importance – Concepts(Needs, Wants & Demands, Products, Value, Exchange, Transaction & Relationship, Market & Marketer) Meaning & Definition of Marketing Management – Objectives – Principles – Steps in Marketing Planning – Marketing Environment – Marketing Mix.

Unit-II: Product Design: Meaning and Definition of product – Features – Importance – Product Classifications/Types of Product - Decisions Involved in Product – Levels of Product – Characteristics of Services – Differences Between Product & Service.

Unit III : Product Mix & Product Line – Factors Influencing Change in Product Mix – Product mix Strategies – Product Mix Decisions – Product Line Decisions/Managing Product Line Decision – Green Marketing -Meaning & Definition of Product Life Cycle (PLC) – Characteristics – Assumptions - Stages.

Unit-IV: Branding: Meaning & Definition – Factors to be considered in Branding – Advantages & Disadvantages. **Packaging:** Meaning & Definition – Importance – Functions – Requirements of Good Packaging – Kinds of packaging. **Labeling:** Meaning & Definition – Classifications – Role of Labeling In packaging. **Pricing:** Meaning & Definition – Objectives – Factors affecting Pricing Decisions – Pricing Methods/Approaches (Cost –Oriented, Customer Demand Oriented, Competition Oriented)

Unit V: Marketing Channels: Meaning & Definition of Marketing Channels – Characteristics – Purpose – Need - Functions – Effectiveness of Marketing Channels – Factors Influencing Channel Decisions – Types of Channels of Distribution.

Recommended Books:

1. S.A. Sherlekar , R. Krishnamoorthy,Himalaya Publishing House Pvt.ltd
2. Philip Kotler and Armstrong, Principles of Marketing, PHI
3. Philip Kotler, Marketing Management, PHI
4. V.S Ramaswamy and S. Namakuari, Marketing Management.
5. J.P.Gupta and Joyti Rana, Principles of Marketing Management, R. Chand & Co.
6. Pearson, Marketing Management

II BBA IV SEMESTER SYLLABUS 2022-23
AFRM-2B: FUNDAMENTALS OF RESEARCH METHODOLOGY

Objective: To equip the students with the basic understanding of research methodology and to provide insight into the application of modern analytical tools and techniques for the purpose of management decision making.

Learning Outcomes: Students should be able to identify the overall process of designing a research study from its inception to its report. This will make them familiar with the steps involved in identifying and selecting a good instrument to use in a study.

UNIT - I: Introduction : Meaning & Definition of Research – Objectives - Importance - Motivation for research - Types of Research- Research Approaches – Limitations.

Defining Research Problem: Research problem – Selection - Necessity of defining the problem – Techniques / Steps involved in Defining a problem.

UNIT - II: Research Design: Meaning of Research Design – Features– Need - Purpose – Components & Requirements of a Good Research Design.

UNIT -III: Sampling Design: Meaning of Sampling – Steps/Elements– Characteristics of a Good Sample Design- Advantages of Sampling – Disadvantages of Sampling – Sampling – with and without replacement – Types/ Methods of Sampling: Random Sampling(Random, Systematic, Cluster, Multistage, Area Samplings), Non random Sampling(Convenience, Judgment, Quota, Panel, Snowball)

UNIT -IV : Collection of Data: Meaning – Types; Primary Data: Meaning– Advantages – Disadvantages; Secondary Data: Meaning– Advantages– Disadvantages; Comparison of Primary Data & Secondary Data.

UNIT -V: Presentation of Data &Report Writing: Frequency distribution: Meaning & Definition of Frequency Distribution – Tabulation Meaning & Essentials for Good Table, Diagrammatic Presentation of Data - Meaning, Importance & Limitations; **(Problems On:** Frequency Distribution, Histograms, Frequency Curves and Frequency Polygon.); Oral and written abstracts, thesis and papers for seminars.

References:

1. Mark Saunders, Philip Lewis, Adrian Thornbill, Research Methods for Business Students, Pearson,ND
2. Churchill, Iacobucci & Israel, Marketing Research: A South Asian Perspective, Cengage, New Delhi
3. C.R. Kothari, Research Methodology, New Age International.
4. Carver & Nash, Data Analysis with SPSS, Cengage, New Delhi
5. Alan Bryman & Emma Bell, Business Research Methods, Oxford University Press.
6. Donald R. Cooper & Pamela S. Schindler, Business Research Methods 8th Edition, Tata McGraw Hill.
7. K.V.S. Sarma, Statistics made sample, do it yourself on PC, Prentice Hall.

UNIT- I

Basic XML Concepts:

Introduction – HTML Vs XML – Syntax of the XML Document – XML Validation – XML DTD – The building Blocks of XML Documents.

Advanced XML Concepts:

DTD Elements: Declaring an element – Empty elements – Elements with Data, Elements with children, Wrapping – DTD Attributes.

UNIT – II :Introduction to PHP : Installing and configuring PHP,MYSQL,XAMPP server.

Variables: Global and super global. **Data types:** Changing type by casting. Use of var_dump operator for data types. **Operators and Expressions:** Assignment operators, arithmetic operators, concatenation operators, comparison operators, increment and decrement operators, constants.

UNIT – III: Flow Control functions in PHP : If statement, If-else statement, Switch statement, using the operator, While statement, do-while statement, for statement, break and continue statement.

UNIT – IV:Working with functions: Calling functions, Defining a function, Returning values from user defined functions, variable scope, Accessing variables with global statement.

Working with Arrays :What are Arrays? Creating Arrays. Creating Associative arrays, Creating multi-dimensional arrays.

UNIT-V: Introduction to MySQL Understanding the Database Design Process: The Importance of Good Database Design, Types of Table Relationships.

Learning basic SQL Commands: Learning the MySQL Data types, Learning the Table Creation Syntax, Using Insert Command, Using SELECT Command, Using WHERE in your Queries, Selecting from Multiple Tables, Using the UPDATE command to modify records, Using REPLACE Command, Using the DELETE Command, Frequently used string functions in MySQL, Using Date and Time Functions in MySQL.

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

Prescribed Text Books:

1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
3. Web Programming Building Internet Applications 2nd Edition by Chris Bates.
4. Web Technology 2nd Edition by N.P. Gopalan, J. Akilandeswari.

Reference Books:

- Beginning PHP and MySQL, W.Jason Gilmore, From Novice to Professional
- PHP and MySQL Web Development, Welling Thomson
- Web Technologies Sammulal Kishor
- Web Technologies Black Book ,Dreamtech publishers

AAWTP-2B: ADVANCED WEB-TECHNOLOGIES LAB

1. Prepare a XML document for book catalog.
2. Prepare a XML document for external DTD.
3. Prepare a XML document for internal DTD.
4. Design a webpage in php to find the given number is Even or Odd.
5. Design a program in php for Fibonacci series.
6. Design a program in php to print sum of numbers from 1to10 using While loop.
7. Design a webpage in php to find the given number in Palindrome or not.
8. Design a program in php to find the days of the week using Switch case.
9. Design a webpage in php to print from AtoZ.
10. Design a program in php to print sum of Squares numbers.
11. Design a webpage using Numeric array.
12. Design a webpage using Associative array.
13. Desing a webpage using Create array.
14. Design a webpage in php for Login form.
15. Design a program in php for using Buttons, user defined functions.
16. DDL Commands in My-SQL
17. DML Commands in My-SQL
18. Establish the connection between MySQL and PHP

III BBA V SEMESTER SYLLABUS 2022-23

AEB-3A: E-BUSINESS

Objective: The objectives of the course are to introduce the concept of electronic commerce, and to understand how electronic commerce is affecting business enterprises, governments, consumers and people in general.

Learning Outcome: Recognize the impact of Information and Communication technologies, especially of the Internet in business operations

UNIT - I: E-commerce: Introduction – Meaning & Definition of e-commerce – Features – Classification – Benefits/Advantages – Limitations/Disadvantages – Resources required for successful implementation of e-commerce – Threats of e-commerce Transactions – Disputes regarding e-commerce Transactions – Concept of M-Commerce – Trends, Issues and Challenges of M-Commerce.

UNIT - II: E- Advertisement: Meaning & Definition of E-Advertisement - Types Of E-Advertising – Advantages of E-Advertisement – Disadvantages of E-Advertisement - The Ethical Issues In E-Business - The Legal Ethical Issues of E-Business.

Unit III: Electronic Payment System: Meaning & Definition - Objectives - Participants In An Online Electronic Payment Transaction -Problems In Traditional Payment Systems - Factors Contributing Towards Electronic Payment Systems - Challenges - Distinction Between Traditional Payment Systems And Electronic Payment Systems - Reasons For Less Popularity Of Electronic Payment Systems-Recommendation To Motivate More Electronic Payment System.

UNIT - IV:Types of Electronic Payment System: Types of Electronic Payment System, Major Electronic Payment System: Electronic or Digital Cash, Credit Card, Debit Card, Smart Card, E- Money, Electronic Fund Transfer, Electronic Cheque, Digital wallets, E-Cash Mobile payment. Electronic payment Gateways - Concepts. **ATM (Automated teller machine):** Meaning & Definition – Various parties involved in Maintaining ATM’s- Types of ATM – Advantages -Disadvantages.

UNIT- V: Customer Relationship Management: Meaning & Definition of CRM- Process of CRM – Principles of Building Profitable CRM – Advantages– Strategies. **e-CRM:** Meaning & Definition – Characteristics - Strategies of e-CRM – Different levels of e-CRM - Advantages– Application of e-CRM – Difference between CRM & e-CRM.

Reference Books:

1. Krishnamurthy, E-Commerce Management, Vikas Publishing House.
2. Turban E. Lee J., King D. and Chung H.M: Electronic commerce-a Managerial Perspective, Prentice-Hall International, Inc.
3. Bhatia V., E-commerce, Khanna Book Pub. Co. (P) Ltd., Delhi.
4. Daniel Amor, E Business R (Evolution), Pearson Education.
5. Krishnamurthy, E-Commerce Management, Vikas Publishing House.
6. David Whiteley, E-Commerce: Strategy, Technologies and Applications, Tata McGraw Hill.
7. P. T. Joseph, E-Commerce: A Managerial Perspectives, Tata McGraw Hill.
8. Jerry, FitzGerald and Alan Dennis, Business Data Communications and Networking,

John Wiley & Sons.

9. Tanenbaum, A. S., Computer Networks, Pearson Education.
10. David A Stamper, Business Data Communications. Addison Wesley.
11. Business Analytics – Methods, Models and Decisions, James R. Evans, Prentice Hall.
12. Business Analytics - An Application Focus, Purba Halady Rao, PHI learning.
13. R.N Prasad and Seema Acharya, Fundamentals of Business Analytics, Wiley India.
14. Domonique Rambure and Alec Nacamuli, “Payment Systems: From the Salt Mines to the Board Room”, Palgrave MacMillan.
15. Weidong Kou, “Payment Technologies for E-Commerce”. Springer, Germany.
16. Donal O’Mahony, Michael Peirce and Hitesh Tewari, “Electronic Payment Systems”, Artech House, Inc.
17. M. H. Sherif, Protocols for Secure Electronic Commerce, Boca Raton, Fla, CRC Press.

III BBA V SEMESTER SYLLABUS 2022-23

ATAX-3A: TAXATION-I

Objective: To make the students to equip with the tax concepts and calculate Total Income & Tax Liability.

Learning outcome: By the end of this course, students should be able to identify and explain the self-assessment system of tax administration.

Unit-I: Introduction: Meaning of Tax –Direct taxes –indirect taxes –History of income tax. **Basic Concepts:** Income –Agriculture Income –Person- Assesses -Assessment year- Previous year –Gross total income –Total income- Exempted Incomes under sec 10-Maximum Marginal Rate of Tax

Unit-II: Residential Status of an individual: Meaning-Resident- Ordinary Resident – Not Ordinary Resident - Non Resident - Scope of Total Income on the Basis of Residential Status. (**Problems on incidence of tax**).

Unit-III: Income under the head Salaries: Meaning –Allowances – HRA – Children’s Education Allowance – Children’s Hostel Allowance-Perquisites- Rent Free Accommodation – Car – Medical Expenses - Profit in lieu of Salary - Treatment of Provided Fund-Deduction under Sec16- Sec 80 C.(Problems included).

Unit-IV: Income from House Property: Meaning-Annual value-Different type’s rentals Values – Computation of income from let out House- Computation of income from self –occupied House- Deductions under Sec.24. (Problems Included)

Unit –V: Income from Capital Gains: Meaning of Capital Assets -Transfer of capital asset-computation short-term capital gain-Cost Inflation Index –Computation of long term Capital Gain-Exempted Capital Gains Under sec 54.

References:

1. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxman Publication.
2. B.B. Lal: Direct Taxes, Konark Publisher (P) Ltd.
3. Bhagwati Prasad: Direct Taxes – Law and Practice, Wishwa Prakashan.
4. Dr. Mehrotra and Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication.
5. Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and sons.
6. Gaur & Narang: Income Tax
7. V. P. Gaur, D.B. Narang, Puja Gaur and Rajeev Puri, Income Tax Law and Practice, Kalyani Publishers.

III BBA V SEMESTER SYLLABUS 2022-23

ABL-3A: BUSINESS LAW

Objective: To understand legal procedures and practices of an organization.

Outcome: The academic study of law gives an insight into legal systems on which much day-to-day life is based.

Unit-I: Law of Contract – Essentials of valid contract, Kinds of Contracts, Offer, Acceptance, Consideration, Capacity of Parties to a contract, Free Consent, Stranger to the contract.

Unit-II: Contingent Contracts, Performance of Contract, Discharge of Contract, Quasi Contracts, Breach of Contracts and Remedies.

Unit-III: Specific Contract – Contract of Indemnity – Guarantee Contract – Contract of Bailment – Pledge – Contract of Agency.

Unit-IV: Sale of Goods Act – Essentials of Sale Contract – Sale and Agreement to Sale – Conditions and Warranties – Unpaid Seller – Rules of transfer of Property.

Unit-V: Companies Act 1956 – Introduction – Characteristics – Formation of a Company – Memorandum of Association (MOA) – Articles of Association (AOA) - Certificate of Commencement of Business – Certificate of Incorporation of Business – Meetings – Resolutions – Winding of a Company – Companies Act 2013. - Corporate Social Responsibility

References:

1. Indian Contract Law – Bare Act, Government of India.
2. N. D. Kapoor Mercantile Law, Sultan Chand & Company, New Delhi.
3. Balchandani – Business Laws.
4. Avatar Singh Mercantile Law, Vikas Publication.
5. S.D.Geet and M.S. Patil: Business Laws.
6. S.S. Gulshan: Business Laws.
7. N.M. Wechlakar: Business Laws.
8. All Bare Acts, Published by the Government of India.

III BBA V SEMESTER SYLLABUS 2022-23
AMA-3A: MANAGEMENT ACCOUNTING

Objective: To integrate GAAP in Accounting for Managers & to excel in problem solving

Outcome: Demonstrate Accounting compliance and planning & to learn the managerial Accounting concepts

Unit – I: Management Accounting - Introduction – Meaning – Nature and Scope - Company Final Accounts; Trading Accounting – Profit & Loss Accounting – Profit & Loss Appropriation Account – Balance Sheet .

Unit – II: Financial Statements & Financial Analysis: Financial Statements – Introduction – Meaning – Importance – Types, Financial Analysis – Meaning – Types.

Ratio Analysis – Introduction – Importance– Computation of Ratios from the Profit & Loss Account – Computation of Ratios from the Balance Sheet –Return on capital employed.

Unit – III: Funds Flow Statement – Introduction – Meaning – Significance and Importance – Difference between Funds Flow Statement and Income Statement – Statement of changes in working capital – Calculation of Funds From Operations – Preparation of Funds Flow Statement.

Unit – IV: Cash Flow Statement – Introduction – Meaning – Importance – Limitations – Differences between Cash Flow Statement and Funds Flow Operations – Procedure for preparing Cash Flow Statement.

Unit – V: Marginal Costing and Break Even Analysis – Marginal Costing – Meaning – Features – Advantages – Limitations – Break Even Analysis - Calculation of Break Even Point – Margin of Safety – Applications of Marginal Costing and Cost-Volume-Profit Analysis – Make/Buy Decision.

References:

1. S.P. Jain, K.L. Narang, Simmi Agarwal and Monika Sehgal, Cost and Management Accounting, Kalyani Publishers.
2. Shashi K. Gupta, R.K. Sharma and Anuj Gupta, Management Accounting and Financial Management, Kalyani Publishers.
3. Debasrshi Bhattacharya, Management Accounting.
4. G. Prasad, Accounting for Managers, Jai Bharat Publishers.

III BBA V SEMESTER SYLLABUS 2022-23

AFMS-3A: FINANCIAL MARKETS & SERVICES

Objective: To familiarize the students with the Financial Markets and Traditional & Modern Financial Services.

Outcome: Students will get equipped with the knowledge of Issues in Primary & Secondary Markets & about the various Financial Services.

Unit – I: Financial Markets – Introduction – Types – Securities and Role of Regulator – Primary Market – Procedure for buying shares through IPO – Dematerialization of Securities.

Unit – II: Secondary Market – Stock Exchanges, Stock Trading – Products in Secondary Market: Equity, Debt: Derivatives – Types: Commodity Derivatives & Financial Derivatives.

Unit – III: SEBI – Objectives of SEBI – Organization – Functioning of SEBI – Powers of SEBI – Role of SEBI in marketing of Securities and protection of Investor Interest – SEBI guide lines towards the issue of Equity Shares and Debentures.

Unit – IV: Financial Services Introduction – Meaning Types – Factoring and Forfeiting– Role of Financial Services – Theoretical Framework – Factoring Services in India.

Unit – V: Mutual Funds – The Concept and Objectives– Types – Advantages– Importance – Risk in dealing with Mutual Funds.

References:

1. Gupta L. C: Stock Exchange Trading in India: Society for Capital Market Research & Development, Delhi, 1997.
2. Financial Markets: A Beginners Module, Work Book from NSE Reference Book.
3. Vasant Desai: Financial Markets and Services: Financial Markets & Services.
4. V. A. Avadhani: Financial Services in India, Himalaya Publishers.
5. Khan M.Y., Financial Services, Tata McGraw Hill Education Private Limited, New Delhi.
6. Siddiah, T., Financial Services, Pearson
7. Tripaty Nalini Prava, Financial Services, Prentice Hall of India, New Delhi.
8. Guruswamy.S, Financial Services, Tata McGraw Hill Education Pvt. Ltd., New Delhi.
9. Rajesh Kothari, “Financial Services in India”, SAGE.

III BBA SYLLABUS FOR V SEMESTER 2022-23

ABBAP-3A: BBA PRACTICALS

Objectives: To gain knowledge of business practices and processes

Learning Outcomes: the capacity to analyze, evaluate and interpret data practically & expose students to the situations at the industry, business and individual levels

UNIT I: BANKING and INSURANCE: Opening Bank Account – KYC Norms - Types of Cheques – Filling up Bank Forms – Demand Draft – Deposit Form – Withdrawal Form – Promissory Note – Booking on line Railway Tickets – Life Insurance Terminology in Life Insurance - General Insurance – Health Insurance.- Fill up the application form to take insurance policy.

UNIT II: DESCRIPTIVE STATISTICS: Classification, tabulation, frequency distribution, diagrammatic and graphic representation, analysis, categorization, coding and sampling.

UNIT III: FINANCIAL FUNCTIONS-using EXCEL: Future value calculation –FV Schedule- Present Value- Net Present Value calculation- Internal Rate of Return- Modified IRR-NPER. PAN CARD – Filling up the application for PAN Card.

UNIT IV: BUSINESS CORRESPONDENCE AND REPORT WRITING: Business Letters – Types– Contents, Business Reports- Types - Contents– Stages of Business Report

UNIT V: FINANCIAL MANAGEMENT: Filling up of Share Application – Filling up of Debenture Application– ITR Forms- DMAT Account – Financial analysis of the company through ratio analysis - Profitability ratio – Current ratio – Quick ratio – Debt Equity Ratio - Working Capital Turnover ratio.

REFERENCE BOOKS:

1. Dictionary of Insurance Terms by Harvey W. Rubin Ph.D.
 2. Statistical Tools for Finance...by Pavel Cizek
 3. Excel 2016 Bible, by John Walkenbach
 4. Building Financial Models with Microsoft Excel, by K. Scott Proctor
 5. Shashi K. Gupta, R.K. Sharma and Anuj Gupta, Management Accounting and Financial Management, KalyaniPublishers.
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APIA-3A: V PHOTOSHOP AND INTERNET APPLICATIONS

Unit – I PHOTOSHOP BASICS: - Photoshop Introduction, Uses of Photoshop, Photoshop versions Screen elements, colors description -Creating and Saving Photoshop Documents - Browsing images and duplicating them.

PHOTOSHOP TOOLS: Tool box description - Marquee tool - Move tool - Lasso tools Magic wand tool - Healing Brush tool and Patch tool. - Brush tool and Pencil tool - Cloning tool- Pattern tool – History brush tool - Art History tool - Eraser tools - Gradient tool - Paint Bucket tool - Blur Tool - Sharpen tool- Smudging tool - Dodge Tool - Burn Tool - Sponge tool - Text tools - Type mask tool - Pen Tools- shapes Tool such as Rectangle, Ellipse, Polygonal, line etc - Eye dropper tool - Measure Tool - Zoom tool - Hand tool - Working with Background and Foreground colors - Quick Mask mode - Working with Screen modes

Unit – II LAYERS: Understanding the Layers - Hiding/Unhiding Layers Palette - Creating a new layer - Selecting a Layer - Deleting a Layer - Naming a Layer – Hiding / Unhiding Layer - Linking Layer – Layer Fill and Opacity – Locking Layers – Layer Modes – Ordering Layers – Copying Layers – Duplicating Layers – Masking Layers – Merging Layers - Layer Properties **BLENDING OPTIONS :** Blending options for Images - Blending options for Shapes - Blending options for Text:

Unit – III SOME IMPORTANT MENU COMMANDS: FILE – Recent documents – Save As – Contact Sheets-Gallery – Printing with Preview – Printing - EDIT – Step forward – Step backward – Cut – Copy – Copy merged – Paste – Paste into – Fill – Stroke – Free Transform – Different Transforms. IMAGE – image modes – Levels – Curves – Color Balance – Brightness/ Contrast – Desaturate – Threshold – Variations LAYERS – New Fill Layer – New Adjustment Layer – Group with Previous – Flatten Image. SELECT – All – Deselect – Reselect – Inverse – Feather – Transform Selection . Filters – All options Filters. VIEW – Working with rules, guides.

WORKING WITH PALLETS : Navigator Pallet – Colour Pallet – History Pallet – Actions Pallet – Brushes – Character – Paragraph

Unit – IV DESIGNING PART: Modifying old images to new one - Black and white photo to colour - Preparing Visiting Cards -Preparing Wedding Invitations -Photo Creations -Preparing Passport size photos - Designing Cover Pages - Flex board designing - Designing real world objects - Creating Photo Albums - Creating different text effects with filters and blending options - Designing techniques for different and variety of creations.

Unit – V Internet Applications: Blog Creation – Maintenance of Blog – Creating and running free website – Using social media for business promotions – using online internet applications – Using free sms, voice calls services – downloading software and business applications – Experiencing virtual life world – Internet security options.

Prescribed Text Book :

2. Adobe Photoshop Class Room in a Book by Adobe Creative Team.

3. Photoshop: Beginner's Guide for Photoshop - Digital Photography, Photo Editing, Color Grading & Graphic...19 February 2016 by David Maxwell

APIP-3A: PHOTOSHOP LAB

1. Modifying old images to new one
 2. Converting black and white photo to colour photo
 3. Preparing a visiting card
 4. Preparing a wedding invitation
 5. Designing a photo in Photoshop
 6. Preparing a pass port size photos
 7. Designing a cover page
 8. How to design a flex board
 9. Designing a real world objects using custom shapes
 10. Creating a photo album
 11. Creating different text effects with filters and blending options
 12. Designing techniques for different and variety of creations
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III BBA VI SEMESTER SYLLABUS 2022-23

ABS-3B: BUSINESS STRATEGY

Objective: To introduce the basics of the how organizations are managed, with a special focus on the role played by a business firm's strategy.

Outcome: To independently assess or predict business performance based on the detailed analysis of a specific problem, case or company.

Unit-I: Introduction to Business Strategy: Concept of Business Strategy, Need for Business Strategy, Essentials of Effective Strategy, Effects of Inadequate Strategies, Functions of Business Strategies.

Unit-II: Strategic Analysis: Strategic Analysis –Definition, Need for Strategic Analysis & Environmental Scanning, Understanding environment of business for strategic analysis, Strategic thinkers & their contributions, Role of Strategic Analysis in Policy making

Unit-III: Strategy Formulation: Types of Strategies, Steps in Strategy Formulation, Core Competencies and their Importance in Strategy Formulation

Unit-IV: Strategic Planning and Implementation: Strategic Planning Process, Types of Strategies, Stability, Expansion or Growth, Mergers and Acquisitions, Activating Strategy, Issues in Strategy Implementation, Integrating the Functional Plan and Policies

Unit-V: Strategic Management Process: Vision, Mission ,Strategic Management Process, Strategic Vision and the role of a Strategist, Criteria for Effective strategy, Role of Strategic Management in Policy Making

References: 1.Nitin Balwani, Strategic Management & Business Policy, Excel Books, New Delhi.

2.Upendra Kachru, Strategic Management: Concepts & Cases, Excel Books, New Delhi. 3.Porter, M.E., Competitive Strategy, The Free Press, New York, 1980.

4.Kazmi, Azhar, "Business Policy and Strategic Management", Tata McGraw Hill, New Delhi.

5.Srinivasan R. Strategic Management –The Indian Context, Prentice Hall of India, New Delhi.

III BBA VI SEMESTER SYLLABUS 2022-23
AIB-3B: INTERNATIONAL BUSINESS

Objective: To facilitate the students in understanding International Business in a multicultural world.

Outcome: Equip them with the knowledge of impact of various economic, legal, cultural, geographical, and political systems on international business.

Unit – I:

International Business-Meaning-Definition-Objectives-Reasons of Internalisation-Internationalisation process- Approaches of International business -Significance-limitations-Difference between International Business & Domestic Business

Unit – II:

Foreign Exchange Markets- Meaning-Definition- Features–Factors affecting foreign exchange market-Classification (spot, forward)-Functions -Participants -Advantages and Disadvantages

Unit – III:

Balance of Payments-Meaning –Definition-Characteristics-Fundamentals of BOP-components (current account, capital account, official reserve account)-BOP accounting statement- Disequilibrium in BOP-Methods of Correction.

Unit – IV:

Trade strategies-Introduction-Types (Inward oriented trade strategies, Outward oriented trade strategies)-Protection-Techniques of protection-Arguments for Protection-Free trade-Arguments for free trade-Free trade vs. Protection-Trade Blocks.

Unit – V:

Procedure and Documents: Export procedure-Import Procedure-Bill of lading-Invoice--AR and GP Forms-Mate Receipt-Letter of Credit-EXIM list-Packing list-Incentives to exports-EXIM Policy 2012.

References:

1. C.Jeevanandam,Foreign Exchange Practice, Concepts&Control, Sultan Chand&Sons.
2. T.S.Balagopal, Export Management, Himalaya Publishing House.
3. KPM Sundaram&Rudradatta, Indian Economy, S.Chand&Co. , New Delhi.
4. Francis Cherumilum, Foreign Trade& Export Management, Himalaya Publication.

III BBA VI SEMESTER SYLLABUS 2022-23

ATAX-3B: TAXATION-II

Objective: To make the students to equip with the tax concepts and calculate Total Income & Tax Liability.

Learning outcome: By the end of this course, students should be able to identify and explain the self-assessment system of tax administration.

Unit-I :Profit and Gains of Business and Profession: Meaning of Business- meaning of Profession- Charging Provisions under sec 28-expeness disallowed for business- computation of profits And gains of business-professional receipts-Profession expenditure-computation of income from Profession.

Unit II: Income from Other Sources: Incomes Chargeable under the head Income from Other Sources- General Incomes-Specific Incomes-Tax Treatment of Gift Received in the Hands of Individual-Grossing up of Interest- computation of Income from Other Sources.

Unit III: Gross Total Income: Meaning –deductions from Gross total Income –sec 80 D, Sec 80 DD, Sec 80 E and Sec 80G.Computation of Total Income of an Individual –computation of tax liability.

Unit IV: Goods and Services Tax: Introduction-Limitations of VAT-Need for Introduction of GST- Advantages and disadvantages of GST-Types of GST-GSTN.

Unit V: Assessment of GST- Self-assessment – Provisional assessment – Scrutiny of returns – Assessment of non-filers of returns – Assessment of unregistered persons – Assessment in certain special cases – Tax Invoice – Credit and Debit Notes – Payment of Tax – Tax Deducted at Source – Electronic Commerce – Definitions - Collection of Tax at source.

References:

1. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxman Publication.
 2. B.B. Lal: Direct Taxes, Konark Publisher (P) Ltd.
 3. Bhagwati Prasad: Direct Taxes – Law and Practice, Wishwa Prakashan.
 4. Dr. Mehrotra and Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication.
 5. Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and sons.
 6. Gaur & Narang: Income Tax
 7. V. P. Gaur, D.B. Narang, Puja Gaur and Rajeev Puri, Income Tax Law and Practice, Kalyani Publishers.
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III BBA VI SEMESTER SYLLABUS 2022-23

ACATT-3B: COMPUTERIZED ACCOUNTING THROUGH TALLY

Objective: The Objective of course is to acquaint students with the accounting concept, tools and techniques influencing business organization.

Learning Outcomes: At the end of the course students be able to use accounting and business terminology, explain the objective of financial reporting and related key accounting assumptions and principles.

Unit – I :Introduction to Tally - Features– Tally Screen elements - Gate way of Tally -Accounts info menu – Inventory info menu – Button Bar – work area etc – Company – Creation of a company – Alternation and Deletion of a company – Company Security.

Unit – II: Classification of Accounts – Accounts groups – Ledger accounts – Hierarchy of Accounts – **Accounts groups of balance sheet:** capital accounts – loans – current accounts – fixed assets – investments – current assets- **Accounts groups of profit and loss account:** sales – purchases – direct and indirect incomes – direct and indirect expenses – common mistakes committed in account groups - Account Masters – Creation and Management of Masters using Tally.

Unit – III: Account Vouchers – Types– Maintenance of Vouchers– Inventory Accounting – Day book - **Final accounts** – Balance sheet – Liabilities side– assets side – Buttons at balance sheet screen – Profit and loss Accounts – Buttons – Trail balance sheet – Cash and Bank Account – Individual Master Reports – Printing configurations.

Unit – IV: Accounting Features: Multi Currency – Bill wise details – Interest Calculations – Cost Centers – Invoice Mode – Cheque Printing - Budgets

Unit – V: Inventory Features: Godowns – Stock categories – Batch wise details – Purchase and sales orders **Inventory Features:** Price Levels – Additional cost of purchase – Actual and Different bills –

References:

1. Implementation of TALLY – BPB Publications
2. Computerized Accounting – M.Yadagiri, G.Srinivas Kalyani Publications.

Objective: To provide students an opportunity to gain an understanding of advertising and sales promotion practices.

Learning Outcome: Demonstrate preparation of evaluation tools for promotion and advertising campaigns, as indicated by suggested methods in projects, assignments, and tests.

Unit I: Advertising: Meaning & Definition - Features– Objectives - Classification - Challenges and Opportunities in Advertising- Steps in Advertising Process - Advantages of Advertising: Manufactures, Consumers, Middlemen and Society - Disadvantages of Advertising.

Unit II: Advertising Agency: Introduction & Meaning – Definition – Importance/Role of Advertising agencies – Types - Functions - Advantages – Disadvantages. Features/Qualities of good advertising copy, Scientific Advertising: Meaning - Phases or Stages of Scientific Advertising.

Unit III: Creative Execution: Creative Execution: Introduction – Meaning – Aspects of creative execution: Verbal Creative Execution - Visual Creative Execution

Verbal Creative Execution: Headlines - Types of headlines (According to their manner of presentation, According to the Contents, According to the Kleppner) – Sub headlines – Slogan – Writing scripts for broad cast media: Radio – Television.

Visual Creative Execution: Layout – Stages of preparing Layout –Layout Formats -Illustrations.

Unit IV: Sales Promotion: Introduction – Meaning – Objectives - Need /Purpose - Importance - Reasons for the Rapid Growth of Sales Promotion – Advantages and Disadvantages of Sales Promotion- Types of sales promotion - Differences between: Sales Promotion & Advertising, Sales Promotion & Personal Selling, Advertising & Personal Selling -Qualities of successful Salesman.

Unit V: Media Planning: Meaning & Definition - Various functions of Media Planning in Advertising - Criteria Considered in the Development of Media Plans - Media Buyer responsibilities -Steps in Development of Media Plan - Factors Influencing Media Choice – Advantages & Disadvantages of Television.

References:

1. Jack G. Wiechmann, N.T.C's Dictionary of Advertising, NTC Publishing Group Lincolnwood, Illinois, U.S.A. 1998.
 2. D.B. Taraporevala : Advertising Management – Selected Readings, D.B. Taraporevala & Sons Co. Private Ltd., Bombay, 1965.
 3. J.S. Chandan, Jagjit Singh, P.N. Malhan, : Essentials of Advertising, Oxford & IBH Publishing Co. Pvt. Ltd, Calcutta, 1990.
 4. Rajeev Batra, John G. Myers, David A. Aaker: Advertising Management, Prentice Hall of India Pvt. Ltd., New Delhi, 1997.
 5. William F Arens, Irwin : Contemporary Advertising, MC Graw Hill, Boston.
 6. Paul Winner: Effective PR Management - A Guide to Corporate Survival, Jaico Publishing House, Bangalore, 2001.
 7. Alison Theaker: The PR Hand Book, Routledge Publishers New York, 2001.
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III BBA VI SEMESTER SYLLABUS 2022-23
ALSCM - 3B: LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Objectives:

To gain a working understanding of logistics principles & to prepare students for career opportunities.

Learning Outcomes:

Ability to address LSCM problems in a holistic approach by taking into account general management concepts, human resources, environmental concerns, and quality, technological and economic aspects

UNIT-I : Logistics Management – Introduction – Definition – Meaning - Types - Logistics management - Importance of Logistics management - Need for Logistic in today's business - Logistics activities-Components in Logistics management.

UNIT-II: Inventory Control-Introduction-Meaning-Types – Demand Forecasting – Concept-Importance of Demand forecasting-Demand forecasting period-Factors affecting Demand forecasting-Methods of estimating future demand-Demand forecasting for new products.

UNIT-III: Supply Chain Management- Meaning and Definition – Features - Objectives - Significance - Functions -Differences between Logistics and Supply Chain Management.

UNIT -IV: Supply Chain - Manufacturing Supply Chain – Service Supply Chain – Process view of Supply Chain (Cycle View-Pull & Push view)-Drivers of Supply Chain Performance-Supply chain Interface with Logistics

UNIT- V: Channel Relationship-Types of Relationship-Dimensions in Channel Relationship-Types of Logistics & Supply chain relations-Significance of Logistics Supply chain relations-Requirements for achieving harmonious relations in logistics and supply chain.

REFERENCES:

1. G.Raghuram & N Rangaraj, logistics and supply chain management-cases and concepts. Mc Millan
 2. Martin Christopher, logistics and supply management ;creating value-adding networks ,FT press
 3. Janat shah, logistics and supply chain management ;text and cases ,Pearson
 4. D K Agarwal,Textbook of logistics and supply chain management Mac Millan2003.
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III BBA SYLLABUS FOR VI SEMESTER 2022-23
SELF STUDY PAPER
AMBS-3B: MARKETING OF BANKING SERVICES

Objectives: The subject covers the fundamentals of banking as applicable on individuals and organizations within the larger economic system.

Learning Outcomes: To enable the students in getting an outlook of how banking sector work on day-to-day basis and how things are done in a professional business set up

Unit – I: Introduction of Banking - Definition of Bank – Meaning - History of Banking –Social Control - Nationalization of Banks – Role of Banks in Economic Development- Functions of Commercial Banks – Narasimhan Committee Recommendations Phase – I, Phase – II – Other Committee Recommendations.

Unit – II: RBI – Functions – Role of Commercial Banks in the Economic Development - NABARD – Cooperative Banks – RRBs.

Unit – III: Banker and customer definition and their relationship - Banker’s Obligations -Different Types of Customers - Innovations in Banking –ATMs, Credit Cards, Online & Offshore Banking etc. – Green Banking

Unit – IV: Banking Services – Customer services in Commercial Banks – Bank Marketing – Role of Information Technology (IT) in the Banking Sector – E- Banking – Recent Trends in Banking

Unit – V:Marketing of Banking Services –Introduction of marketing - Four P’s of marketing – marketing Management Concepts - Nature of Marketing of Banking Services – Purpose of Marketing Bank Services – Services rendered by Banks – Current Account – Saving Account – Fixed Deposit Account – Night Safe Facilities – Safe Custody – Leasing – Loan Syndication – Telegraphic Mail Transfer – Cheque Clearing – Bank Draft – Standing Orders – Problems facing in Marketing of Bank services – How to improve marketing of bank services

References:

1. Dr. C. Satyadevi “Financial Services – Banking and Insurance” – S. Chand Publishing – New Delhi.
2. Y. S. Kiranmayi, A. Uttama Durga Devi, “Banking Theory and Practice”, Jai Bharat Publications, Guntur.
3. S.A. Sherlekar , R. Krishnamoorthy,Himalaya Publishing House Pvt.ltd

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN, ELURU

ECONOMICS- SYLLABUS I BA I SEMESTER ECONOMICS

SEMESTER – I PAPER-I

MICRO ECONOMIC ANALYSIS

Module–1: Economic Analysis and Methodology

Scarcity and Choice as fundamental problems of economics - Opportunity Cost - Production Possibilities Curve - Micro and Macro Analysis - Micro economic analysis – Scope and Importance -Principles of Microeconomics : Allocation of Resources - Optimization, Equilibrium and Marginal analysis -Rationality Principle the concept of Welfare

Module -2: Theory of Consumption

Concept of Demand -Factors determining demand - Law of Demand - reasons and exceptions - Elasticity of Demand -Cardinal and Ordinal utility - Indifference Curveanalysis
: Properties of Indifference curves, Indifference Curve Map -Marginal Rate of Substitution - Budget Line - Changes -Consumer Equilibrium under Indifference Curve Analysis – Consumers' Surplus and Indifference Curve Analysis

Module -3: Theory of Production

Concept and Objectives of Firm - Production Function: Cobb- Douglas Production Function
-Law of Variable Proportions -Laws of Returns to Scale - Economies of large scale - Concepts of Cost - Total, Average and Marginal Costs - Law of Supply - Concept of Revenue : Total, Average and Marginal Revenues - Relation between Average and Marginal Revenues and elasticity ofSupply

Module-4: Theory of Exchange

Concepts of Market: Criteria for Classification of Markets - Perfect Competition– Conditions, Price and Output determination; Monopoly: Conditions, Price and Output Determination - Price Discrimination;

Selling Costs; Oligopoly -Types- Kinky demand curve and Price rigidity

Module - 5: Theory of Distribution

The concepts of Functional and Personal Distribution of Income - Marginal Productivity Theory of Distribution - Modern Theory of Distribution -Concept of Rent - Ricardian Theory of Rent – Marshall's concepts of Economic Rent and Quasi Rent; Theories of Wage Determination: Subsistence Theory and Standard of Living Theory - Modern Theory of Wages; Classical Theory of Interest -Loanable Funds Theory of Interest -Liquidity Preference Theory of Interest; Theories of Profit: Risk and Uncertainty, Dynamic and InnovationsTheories.

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ECONOMICS- SYLLABUS I BA II SEMESTER ECONOMICS

SEMESTER II PAPER- II

MACROECONOMIC ANALYSIS

Module - 1: National Income

Macroeconomics - Definition, Scope and Importance - Difference between Micro economic and Macro economic Analyses – Circular Flow of Income -National Income: Definitions, Concepts, Measurement of National Income - Difficulties - Importance - Concept of Green Accounting

Module -2: Theory of Employment

Classical Theory of Employment - Say's Law of Markets - Criticism -Keynesian Theory of Employment - Consumption Function - Keynes' Psychological Law of Consumption - Average and Marginal Propensity to Consume - Factors determining Consumption Function –Brief Review of Relative, Life Cycle and Permanent Income Hypotheses - Investment Function: Marginal Efficiency of Capital -Multiplier and Accelerator - Keynesian Theory of Employment - Applicability to Developing countries

Module – 3: Money and Banking

Definitions of Money - Concepts of Money, Liquidity and Finance - Money Illusion - Gresham's Law - RBI classification of Money - Theories of Money: Fisher and Cambridge (Marshall, Pigou, Robertson and Keynes equations) - Banking - Definition and types of Banking - Commercial Banks - Functions -Recent Trends in Banking - Mergers and Acquisitions - Central Bank - Functions - Control of Credit by Central Bank - NBFCs- Factors contributing to their Growth and theirRole

Module – 4: Inflation and Trade Cycles

Inflation: Concepts of Inflation, deflation, reflation and stagflation - Phillip's Curve - Measurement of Inflation - CPI and WPI -Types of Inflation - Causes and Consequences of Inflation -Measures to Control Inflation. Trade Cycles: Phases of a Trade Cycle -Causes and Measures to control Trade Cycles

Module -5: Finance and Insurance

Financial Assets and Financial Instruments - Financial Markets - Functions of Money Market - Functions of Capital Market - Stock Market - Exchanges – Indices:Sensex and Nifty - Concept of Insurance -Types and Importance ofInsurance.

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ECONOMICS- SYLLABUS II BA III SEMESTER ECONOMICS

PAPER - III

DEVELOPMENT ECONOMICS

Module - 1: Economic Growth and Development

Economic Development as a Branch of Study of Economics – Scope and Importance - Distinction between Economic Growth and Economic Development -Measures of Economic Development and their limitations - Relevance of Herd (Group) Immunity in the context of COVID 19 - three core values of economic development : Sustainability, Self-esteem and Freedom – Economy and Environment : Concepts of sustainable development and inclusive growth

Module -2: Modern Economic Growth

Characteristics of Underdeveloped Countries - World Bank and IMF Classification of countries - Modern economic growth – Kuznets' Six Characteristics -Obstacles to economic development - Vicious Circle of Poverty and cumulative causation -Factors of economic growth: Economic and Non-economic - Capital Formation – Foreign and Domestic capital, Debt and Disinvestment.

Module-3: Theories of Development and Underdevelopment

Classical Theory: Adam Smith, Ricardo and Malthus -Marxian Theory - Schumpeter Theory -Rostow's Stages of Economic Growth -Harrod-Domar two sector model -Solow's Model and Robinson's Golden Age

Module – 4: Strategies of Economic Development

Strategies of Economic Development – Big Push -Balanced Growth -Unbalanced Growth - Mahalanobis Model - Agriculture vs Industry -Capital Intensive Technology vs Labour Intensive Technology -Role of Infrastructure in Economic Development

Module - 5: Institutions and Economic Development

Role of State in Economic Development -Role of Markets - Market Failure and Regulation

-NITI Ayog - Economic Federalism -Financial Institutions and Economic Development -Role of International Institutions-IDBI, ADB, IMF -Foreign Trade - FIIs and FDIs

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN, ELURU

ECONOMICS- SYLLABUS

II BA IV SEMESTER ECONOMICS PAPER-IV

ECONOMIC DEVELOPMENT- INDIA AND ANDHRA PRADESH

Module – 1 Basic Features

Basic characteristics of Indian Economy as a developing economy – Economic development since independence - Objectives and achievements of planning – Planning Commission/NITI Ayog and their approaches to economic development - India's Rank in Global Human Development Index .

Module 2 National Income and Demography

Trends in National income - Demographic trends - Poverty and Inequalities – Occupational Structure and Unemployment - Various Schemes of employment generation and eradication of poverty – Issues in Rural Development and Urban Development –Intra-state and Inter-state Labour Migration and unorganized sector Problems of Migrant Labour

Module – 3 Agricultural and Industrial Developments

Indian Agriculture – Agricultural Strategy and Agricultural Policy – Agrarian Crisis and land reforms – Agricultural credit – Minimum Support Prices -Malnutrition and Food Security - Indian Industry - Recent Industrial Policy – Make-in India – Start-up and Stand-up programmes – SEZs and Industrial Corridors - Economic Reforms and their impact - Economic initiatives by government of India during COVID - Atmanirbhar Bharat package.

Module -4 Indian Public Finance

Indian Tax System and Recent changes – GST and its impact on Commerce and Industry – Centre, States financial relations- Recommendations of Recent Finance Commission – Public Expenditure and Public Debt - Fiscal Policy and Budgetary Trends

Module- 5 Andhra Pradesh Economy

The basic characteristics of Andhra Pradesh economy after bifurcation in 2014 – Impact of bifurcation on the endowment of natural resources and state revenue – new challenges to industry and commerce - the new initiatives to develop infrastructure – Power and Transport - Information Technology and e-governance – Urbanization and smart cities – Skill development and employment – Social welfare programmes.

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ECONOMICS- SYLLABUS II BA IV SEMESTER ECONOMICS PAPRE -V

STATISTICAL METHODS FOR ECONOMICS

Module – 1: Nature and Definition of Statistics

Introduction to Statistics – Definition, scope, importance and limitations of Statistics –
Primary and Secondary data- Census and Sampling techniques and their merits and demerits

Module – 2: Diagrammatic Analysis

Collection of data - Schedule and questionnaire – Frequency distribution – Tabulation –
diagram and graphic presentation of data – Histogram, Frequency Polygon, Cumulative
Frequency Curves - Bar Diagrams and Pie Diagram

Module – 3: Measures of Central Tendency and Dispersion

Measures of Central Tendency and Dispersion - Types of averages- Arithmetic Mean,
Geometric Mean, Harmonic Mean – Median – Mode – Dispersion - Range, Quartile
Deviation, Mean Deviation, Standard Deviation- Coefficient of Variation.

Module – 4: Correlation and Regression

Correlation and Regression - Meaning, Definition and uses of Correlation- Types of
Correlation- Karl Pearson's Correlation coefficient - Spearman's Rank Correlation-
Regression Equations - utility of regression analysis – Demand forecasting.

Module – 5: Time Series and Index Numbers

Time Series and Index Numbers: Definition and components of Time Series – Measurement
of Time Series – Moving Average and the Least Squares Method – Index Numbers -
Concepts of Price and Quantity Relatives – Laspeyres's, Paasche's and Fisher's Ideal Index
Numbers – Uses and Limitations of Index Numbers.

ECONOMICS

III.B.A V Semester Course 6C: Insurance Services

Unit 1: Insurance Concept and Principles

Risk Management: Risk and Uncertainty, Risk Classification – Concept, Importance and Types of Insurance– Principles of Insurance – Insurance Regulations in India - Role of IRDA and Insurance Ombudsman –Scope for Insurance Business in India.

Unit 2: Life Insurance and Products

Life Insurance: Nature and Features - Major Life Insurance Companies in India - Important Life Insurance Products/policies and their Features: Conventional, Unit Linked, Annuities, Group Policies – Medical Examiner.

Unit 3: General and Health Insurances and Products

General Insurance: Nature, Features and Types - Major General Insurance Companies in India - Important General Insurance Products/Policies and their Features - Surveyor – Health Insurance: Nature and Features - Health Insurance Companies in India - Major Health Insurance Products/policies and their Features: Individual, Family, Group.

Unit 4: Practicing as an Insurant Agent

Insurance Contract and Terms of Insurance Policy - Registration of Insurance Agency with the Company — Procedure to issue a Policy: Application and Acceptance – Policy Lapse and Revival – Premium Payment, Assignment, Nomination and Surrender of Policy – Policy Claim - Important Websites and Apps of Insurance in India.

Unit 5: Understanding the Customer and Case Studies

Insurance Customer and Categories – Understanding Customer Mindset and Satisfaction - Addressing the Grievances of the Customer – Ethical Behavior in Insurance – Moral Hazard –Discussion of two different Case Studies related to Life or General or Health Insurance Services.

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ECONOMICS

III.B.A V Semester Course 7C: Banking and Financial Services

Unit1: Principles of Banking and Indian Banking System

Meaning of Banking – Principles of Banking – Functions of Banking – Structure of Indian Banking System – Regulations of Banking in India – Role of RBI in Banking – Anti-money Laundering - Basics of Financial literacy - Problems and Challenges of Banking in India.

Unit 2: Deposits, Loans and Digital Banking

Bank Deposit Account Types – Account Opening and Closing – Banking Customer types – KYC Norms – Negotiable Instruments: Cheque, Bill of Exchange, Promissory Note, Endorsement - Principles of Lending – Different categories of Loans – Mortgaging -Priority Sector Lending – E-Banking facilities: Debit Card, Credit Card, Net Banking, Mobile Banking, Tele-banking, Micro ATMs, Digital Currency – Core Banking Solutions.

Unit 3: Banking Correspondents and Common Service Centers

Banking Correspondent Model - Activities of Banking Correspondent: Deposit Mobilization. Identification of Borrowers, Collection and Recovery Loan, Other Banking Services – Common Services Centre (CSC) - Provision of Services by CSC – Requirement for Registering CSC and Telecentre - Case Study of Banking Correspondents with any Bank or CSC in Local Area.

Unit 4: Financial Services of NBFIs

Non-Banking Financial Institutions (NBFIs): Types and Major Players of NBFIs in India – Important Financial Services offered by NBFIs and their Features – Concept of EMI - Micro Finance: Concept and Operation - Chit Funds: Concept and Operations– Payment Banks - Regulations of NBFIs in India – Problems and Challenges of NBFIs in India.

Unit 5: Work with Finance Service Company (FSC)

Types of loans by Finance Service Company (FSC) – Customer of FSC: Types and Needs - Marketing of FSC's Loans – Procedures and Requirements in FSC's Loan Sanction - Collection and Recovery of FSC Loans - Case Study of a FSC's services in

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN, ELURU

I.B.COM ECONOMICS – II SEMESTER

Business Economics

Unit-I:

Introduction: Meaning and Definitions of Business Economics - Nature and Scope of Business Economics - Micro and Macro Economics and their Interface.

Unit-II:

Demand Analysis: Meaning and Definition of Demand – Determinants to Demand – Demand Function - Law of Demand – Demand Curve – Exceptions to Law of Demand - Elasticity of Demand – Measurements of Price Elasticity of Demand

Unit III:

Production, Cost and Revenue Analysis: Concept of Production Function – Law of Variable Proportion - Law of Returns to Scale - Classification of Costs - Break Even Analysis - Advantages

Unit-IV:

Market Structure: Concept of Market – Classification of Markets - Perfect Competition – Characteristics – Equilibrium Price - Monopoly – Characteristics – Equilibrium Under Monopoly.

Unit-V:

National Income: Meaning – Definition – Measurements of National Income - Concepts of National Income - Components of National Income - Problems in Measuring National Income

I.BBA ECONOMICS – I SEMESTER

Managerial Economics

UNIT-I Introduction to Managerial Economics

Nature, scope and definition of Managerial Economics. Application of managerial economics, Micro and Macro Economics, Basic principles of managerial economics, opportunity costs principle, increment principle, principle of time perspective, Discounting principle.

UNIT-II Consumer behavior, demand and supply analysis

Law of demand, Theory of demand, shift in demand curves, concept of measurement of elasticity of demand, Factors affecting elasticity of demand, cross elasticity of demand

UNIT-III Consumer behavior utility approach

Cardinal utility approach, diminishing marginal utility, Law of equi marginal utility, ordinal utility approach, indifference curve, Marginal rate of substitution, Budget line and consumer equilibrium Law of supply, Shift in supply curve.

UNIT-IV Theory of production, cost and firm's behavior

Meaning, concept of production, Factors of production and production function, Fixed and variable factors, Law of variable proportion and law of returns of scale, Concept of cost, cost function, short run cost, long run cost, Economics and dis economics of scale.

Explicit cost and implicit cost, private and social cost, perfect competition, Monopoly, Monopolistic competition, oligopoly, Pricing in various market structures.

UNIT-V Macro Economic Analysis

Circular flow of income, national income concepts, Theory of income and employment: classical, Modern (Keynesian) approach, circular flow of income, national income concepts

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II B.A III SEMESTER ECONOMICS

ADD-ON COURSE SYLLABUS

TITLE: SELF HELP GROUPS –DWACRA

UNIT-I

Self help groups – Self help groups in Andhra Pradesh – evolution of SHGs in Andhra Pradesh – DWACRA – Objectives of the programme link – ages with other programmes – savings and credit

UNIT – II

DWACRA in Andhra Pradesh – SAPAP – Velugu’s vision – Velugu strategy – SMERLC – Livelihoods Enhancement Program

UNIT – III

Swarnajanthi Gram Swarojgar Yojana – Social Mobilization of the poor – SGSY. Indira Kranthi Patham – Objectives of IKP.

UNIT- IV

Categorization of Groups – Community Investment Fund. SHG Movement – Evolution of SHG Federation – Financing of SHG Federations.

UNIT- V

Present Status of SHG Movement in Andhra Pradesh – SHG Bank Linkage Programme – Criteria for selecting SHGs – State Government Support for the SHG Movement – State Revolving Fund – Waiving of Stamp Duty – Pavala Vaddi Scheme – Initiatives of NABARD in Andhra Pradesh

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN (A) ELURU**Department of Social Sciences****History Syllabus 2022-2023****I Year B.A - Semester -I****Course 1 : ANCIENT INDIAN HISTORY AND CULTURE****(From Indus Valley Civilization to 13th Cent A.D)**

Unit –I Ancient Indian Civilization (from Circa 3000 BC to 6thBC): Indus Valley Civilization - Salient Features; Vedic Age -Society, Polity, Economy, Culture during early and later Vedic period

Unit –II Ancient Indian History & Culture (6thCentury BC to 2rdCentury AD): Doctrines and Impact of Jainism and Buddhism; Mauryan Administration, Society, Economy & Culture - Ashoka's Dhamma - Kanishka's Contribution to Indian Culture

Unit –III History & Culture of South India (2ndCentury BC to 8thCentury AD): Sangam Literature; Administration, Society, Economy and Culture under Satavahanas; Cultural contribution of Pallavas.

Unit –IV India from 3rd century AD to 8th century AD: Administration, Society, Economy, Religion, Art, Literature and Science & Technology under Guptas –Samudragupta; Cultural contribution of Harsha: Arab Conquest of Sind and its Impact

Unit –V History and Culture of South India (9thcentury AD to 13thcentury AD): Local Self Government of Cholas; Administration, Society, Economy and Culture under Kakatiyas –Rudram Devi

I B.A- Semester II**Course 2 : MEDIEVAL INDIAN HISTORY AND CULTURE****(From 1206 To 1764 A.D.)**

Unit -I Impact of Turkish Invasions –Balban, AllauddhinKhilji, Md.Bin Tughluq - Administration, Society, Economy, Religion and Cultural developments under Delhi Sultanate (from 1206to 1526 AD) .

Unit –II Impact of Islam on Indian Society and Culture –Bhakti Movement; Administration, Society, Economy, Religion and Cultural developments under Vijayanagara Rulers.

Unit –III Emergence of Mughal Empire –Babur –Sur Interregnum -Expansion & Consolidation of Mughal Empire –Akbar, Jahangir, Shah Jahan, Aurangzeb

Unit –IV Administration, Economy, Society and Cultural Developments under the Mughal –Disintegration of Mughal Empire -Rise of Marathas under Shivaji.

Unit –V India under Colonial Hegemony: Beginning of European Settlements -Anglo-French Struggle –Conquest of Bengal by EIC

II B.A- Semester III**Course 3 : MODERN INDIAN HISTORY AND CULTURE****(From 1764 To 1947 A.D.)**

Unit -I Policies of Expansion –Warren Hastings, Cornwallis -Subsidiary Alliance & Doctrine of Lapse –Causes & Results of 1857 Revolt –Lyttton, Rippon, Curzon

Unit –II Social, Religious & Self-Respect Movements –Raja Rammohan Roy, Dayananda Saraswathi, Swami Vivekananda, JyotibaPhule, Narayana Guru, Periyar, Dr. B. R. Ambedkar

Unit- III Causes for the growth of Nationalism -Freedom Struggle from 1885 to 1920: Moderate Phase —Militant Phase: Vandemataram Movement -Home Rule Movement.

Unit –IV Freedom Struggle from 1920 to 1947: Gandhiji’s Role in the National Movement –Revolutionary Movement –Subhas Chandra Bose.

Unit –V Muslim League & the Growth of Communalism –Partition of India –Advent of Freedom -Integration of Princely States into Indian Union –SardarVallabhai Patel.

II B.A- Semester IV

Course 4 : HISTORY & CULTURE OF ANDHRA

(FROM 1512 TO 1956 AD)

Unit -I Andhra through 16th & 19th Centuries AD: Evolution of Composite Culture -The Qutb Shahis of Golconda –Administration, Society & Economy –Literature & Architecture; Advent of European and settlements in Andhra -Occupation of Northern Circars and Ceded Districts–Early revolts against the British.

Unit –II Andhra under British rule: Administration –Land Revenue Settlements –Society –Education -Religion –Impact of Industrial Revolution on Economy –Peasantry & Famines –Contribution of Sir Thomas Munroe & C. P. Brown –Impact of 1857 Revolt in Andhra.

Unit –III Social Reform & New Literary Movements: Kandukuri Veeresalingam, Raghupathi VenkataRathnam Naidu, Guruzada Apparao, KomarrajuVenkata Laxmana Rao; New Literary Movements: Rayaprolu Subbarao, Viswanatha Sathyanarayana, GurrarnJashua, Boyi Bheemanna, Sri Sri.

Unit –IV Freedom Movement in Andhra (1885-1947): Vandemataram Movement–Home Rule Movement in Andhra-Non-Cooperation Movement -Alluri Seetarama Raju & Rampa Revolt (1922-24) -Civil Disobedience Movement –Quit India Movement

Unit –V Movement for separate Andhra State (1953)and AP (1956): Causes –Andhra Maha Sabha–Conflict between Coastal Andhra &Rayalaseema –Sri Bagh Pact –work of various Committees–Martyrdom of PottiSriramulu –Formation of separate Andhra State(1953); Movement for formation of Andhra Pradesh (1956): VisalandhraMahasabha –Role of Communists –States Reorganization Committee –Gentlemen’s Agreement –Formation of Andhra Pradesh

II B.A- Semester IV

Course 5 : HISTORY OF MODERN WORLD

(From 15th Century AD to 1945 AD)

Unit -I Transformation from Medieval to Modern Era –Chief Characteristics; Glorious Revolution (1688) –Origin of Parliament Bill of Rights –Results

Unit –II American Revolution (1776); French Revolution (1789) –Causes, Course and Results

Unit –III Unification of Italy; Unification of Germany

Unit –IV Communist Revolution in Russia; World War I: Causes –Results of the War –Paris Peace Conference; League of Nations

Unit –V World War II: Causes, Fascism & Nazism –Results; The United Nations Organization: Structure, Functions and Challenges

HISTORY

III B.A Semester – v

Course 6B: Tourism and Hospitality Services

UNIT I

Tourism – Definition – Nature and Scope – History of Tourism – Types of Tourism – Domestic and International Tourism – Causes of rapid growth of Tourism – National Institute of Tourism and Hospitality Management.

UNIT II

Relationship between History and Tourism – Major tourist spots in A.P – Gandikota, Nagarjunakonda, Salihundam, Konaseema.

UNIT III

Characteristics of Hospitality Industry – Inflexibility, Intangibility, Perishability - Types of Hospitality Jobs – Hotel Manager, Hotel Receptionist, Restaurant Manager, Catering assistant, Executive Chef – Concepts of Athidi Devobhava – Types of Hotels in India.

UNIT IV

Duties, Responsibility, and skill of Front Office Staff – Duties, responsibilities and Skills of House Keeping Staff – Guest Stay process in a hotel – Major Processes and stages associated with it.

UNIT V

Different type of Services offered in Selected Hotels/Motels/Restaurants - Room Service, Catering services – Different Types of Managerial issues – Service etiquettes

HISTORY

III B.A Semester – V

Course 7B : Tourism Guidance and Operating Skills

Unit I

Meaning of Tour guide – types of tour guides: heritage guide, nature guide, adventure guide, business guide, special interest guide etc – duties and responsibilities of guides – various roles of tour guides.

Unit II

Guiding technics: leadership skills, social skills, presentation skills, communication skills – Guide's personality skills : passion, empathy, enthusiasm, punctuality, humor etc/ Personal hygiene and grooming/code of conduct.

Unit III

Guest Relationship Management – Handling emergency situations/Medical, Personal, Official, Visa/Passport, death, Handling Guests with special needs/Different Abilities/Different age groups.

Unit IV

Conducting tours : Pre-Tour Planning, Root Chart, Modes of Transportation, Security Measures and Checklists etc - Conducting various types of tour - Relationship with Fellow Guides - Coordination with hospitality institution.

Unit V

Travel Agency and Tour operation: Difference between Travel Agent and Tour operator- Functions Of Tour Operator-Types of Tour Operations and of Tour Operators-A brief study of tour operating agencies like APTDC, Southern Travels etc.

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN ,ELURU

Department of Social Sciences

Political Science Syllabus 2022-23

The following are the titles proposed

IBA	I SEMESTER	PAPER I	Introduction to Political Science
IBA	II SEMESTER	PAPER II	Basic Organs of Government
II BA	III SEMESTER	PAPER III	Indian Government and Politics
II BA	IV SEMESTER	PAPER IV	Indian Political Process
	IV SEMESTER	PAPER V	Western Political Thought
III.B.A	V SEMESTER	PAPER VI	Office Management
III. B.A	V SEMESTER	PAPER VII	Personnel Administration

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN ,ELURU
POLITICAL SCIENCE
I B.A I SEMESTER

Course-1: INTRODUCTION TO POLITICAL SCIENCE

Unit : I Introduction

1 .Definition , Nature Scope of Political Science – Relations with allied disciplines (History , Economics , Philosophy and Sociology)

2 Approaches to the study of Political Science :

Traditional Approach – Philosophical , Historical
Modern Approach – Behavioral and System Approach

Unit –II: State

1 . Definition of the State , Elements of the State , Theories of Origin of the state – (Divine Origin , Force , Evolutionary and Social Contract).

2 .Concept of Modern state and Welfare state .

Unit –III : Concepts of Political Science

1 Law , Liberty ,Equality

2. Power ,Authority and Legitimacy .

Unit –IV Theories of Rights

1 Meaning , Nature and Classification of Rights

2 Theories of Rights

Unit V : Political Ideologies

1 Liberalism , Individualism ,Anarchism

2. Socialism , and Multiculturalism .

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN ,ELURU

I. B.A II Semester - Basic Organs of the Government

Unit –I: Constitution

1. Meaning , Definition , Origin and Evolution of Constitution
- 2 Classification of the Constitution – Written and unwritten : Rigid and Flexible .

Unit –II :Organs of the Government

- 1 .Theory of Separation of power – B. D Montesquieu .
- 2 . Legislature – Unicameral and Bicameral – power and Functions ,
Executive – Types, Powers and Functions .
Judiciary – Powers and Functions .

Unit - III : Forms of Government

- 1 . Unitary and Federal forms of Government – Merits and Demerits
- 2 Parliamentary and Presidential form of Government – Merits and Demerits

Unit – IV : Democracy

- 1 Meaning , Definition , Significance , Theories and Principles of Democracy
- 2 Types of Democracy : Direct and Indirect Democracy , Methods , Merits and Demerits – Essential Conditions for Success of Democracy .

Unit – V Political parties , Pressure groups and public opinion

- 1 .Meaning , Definition and Classification of Political Parties : National and Regional – Functions of Political Parties .
- 2 Pressure Groups – (Interest Groups) – Meaning , definition ,Types ,Functions and Significance of Public Opinion

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN ,ELURU

II. B.A – III. Semester

Paper – III INDIAN GOVERNMENT AND POLITICS

Unit – 1 :SOCIAL AND IDEOLOGICAL BASE OF THE INDIAN CONSTITUTION

- 1 . Constitutional Development in India during British Rule – A Historical Perspective with reference to government of Indian Acts ,1909,1919 and 1935 .
2. Constituent Assembly – Nature , Composition , Socio- Economic , Philosophical Dimensions and Salient Features of the Indian Constitution

Unit – II Individual and State

- 1 Fundamental Rights , Directive Principles of State Policy and Fundamental duties – Differences between Fundamental Rights and Directive Principles of State Policy .
- 2 . The “Doctrine of Basic Structure of the Constitution “ with reference to Judicial Interpretation and Socio- Political Realities

Unit – III :UNION EXECUTIVE

- 1 . President of India – Mode of Election , Powers and Function
- 2 . Parliament – Composition , Powers and Functions , Legislature Committees , Prime Minister and council of Ministers – Powers and Functions , Role in Coalition Politics .

Unit – IV :STATE EXECUTIVE

- 1 Governor – Mode of appointment , Powers and Functions
- 2 Legislature – Composition , Powers and Functions , Chief Minister and Council of Ministers - - Powers and Functions

Unit –V THE INDIAN JUDICIARY

- 1 Supreme court – Composition and Appointment , Powers and Functions or Jurisdiction of the Supreme court , Judicial Review , Judicial Activism .
- 2 High Court – Composition , Powers and Functions , Debate on the mode o f appointment of judicial Appointment commission and Judicial Reforms

II. B. A IV SEMESTER – PAPER IV INDIAN POLITICAL PROCESS

Unit – I : FEDERAL PROCESSES

- 1 Features of Indian Federal System – Central – State Relations – Legislature , Administrative , and Financial
- 2 Emerging Trends in Central – State Relations – Restructuring centre – State Relations- Recommendation of SarkariaCommission , M. M. Punchi Commission .

UNIT – II ELECTORAL PROCESSES

- 1 The Election Commission of India , Powers and Functions .
- 2 Issues of Electoral Reforms , Voting BEHSVIOUE – Determinants and Problems of Defections .

Unit :III Grossroot Democracy –Decentralization

- 1 Panchayat Raj System – Local and Urban Governments – Structure , Powers and Functions
- 2 Democratic Decentralization – Rural Development and Poverty Alleviation with reference to 73rd and 74th constitutional amendment Acts , Challenges and Prospects

Unit – IV : Social Dynamics and Emerging challenges to Indian Political System

- 1 Role of Caste , Religion , Languages and Regionalism in India
- 2 Politics of Reservation , Criminalization of Politics and Internal threats to Security .

Unit- V Regulatory and Governance institutions

1. NITI Ayog , Finance Commission , Comptroller and Auditor General of India
- 2 Central Vigilance Commission ,Central information commission ,Lokpal and Lokayukta

CH.S.D.ST.THERESA' COLLEGE FOR WOMEN ,ELURU
II. B. A IV SEMESTER – PAPER V WESTERN POLITICAL THOUGHT

Unit –I ANCIENT GREEK POLITICAL THOUGHT

1. Plato-Rule of Philosopher Kings-Theory of Justice-Ideal State and Education
2. Aristotle-Theory of State-Classification of Governments-Citizenship, Slavery and Theory of Revolutions

UNIT – II MEDIEVAL AND MODERN POLITICAL THOUGHT

1. St.Augustine-Theory of Two Cities
2. NiccoloMachiavelli-State and Statecraft

UNIT-III : CONTRACTUAL POLITICAL THOUGHT

1. Thomas Hobbes- Social Contract and Absolute Sovereignty.
2. John Locke- Human Nature, State of Nature, Social Contract, Natural Rights and Limited Government
3. Jean Jacques Rousseau- Human Nature, State of Nature, Social Contract, General Will and Popular Sovereignty

UNIT-IV UTILITARIAN POLITICAL THOUGHT

1. Jermy Bentham-Theory of Utility, Law and Reforms
2. J.S.Mill-Theory of Liberty and Representative Government.

UNIT-V MARXIST POLITICAL THOUGHT

1. Karl Marx-Dialectical Materialism, Theory of Surplus Value and Class Struggle.
2. Antonio Gramsci-Hegemony and Civil Society

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN ,ELURU

POLITICAL SCIENCE
III.B.A Semester V
Course 6C: OFFICE MANAGEMENT

Unit: 1

Introduction to Office, Office structure-Office Management: Meaning, Nature, Importance, Elements and Functions of Office Management-Basic Principles of office management.

Unit: II

Office organization: Definition, Characteristics-Office Planning, Accommodation, Layout and Office Environment.

Unit: III

Office Record Management-Objectives and Importance-Filing System: Steps in filing, Essentials for filing, Classification and arrangements of files, Modern filing methods using Information and Communication Technology and devices- Indexing: Essentials of a good indexing and Records retention and Micro filing.

Unit: IV

Office Communication: Meaning and mailing, Barriers to communication - Correspondence and Report Writing-Types- Periodical reports.

Unit: V

Form Letters: Meaning, Principles, Factors in designing office forms-Supervisory Skills- Importance of Motivation and Leadership-Issues in Office Management- Recent trends: e-office, use of modern appliances and application of IT in office management

CH.S.D.ST.THERESA'S COLLEGE FOR WOMEN ,ELURU

POLITICAL SCIENCE

III.B.A Semester V – Course 7C: PERSONNEL ADMINISTRATION

Unit: I

Personnel Administration: Concept, Nature, Scope and Significance-Hierarchy in Personnel Administration-Roles and Responsibilities of Personnel Administrative Officers- Bureaucracy: Meaning, Characteristics, Nature, Importance and its role in modern state.

Unit: II

Recruitment: Meaning and Importance, Types of Recruitment, Methods of recruitment with regard to All India, Central and State Services-Union Public Service Commission and State Public Service Commissions-Constitutional provisions and Composition, Functions and Role.

Unit: III

Training: Meaning, Objectives, Types and Significance-Training Institutions in India-Promotion- Promotion procedure-Career Planning, Evaluation and Development-Motivation and Morale- Performance Appraisal.

Unit: IV

Administrative Ethics-Integrity in administration-Code of Conduct-Common Lapses and Disciplinary Procedure-Employee and Employer Relations-Rights of Civil Servants.

Unit: V

Problems in Personnel Administration-Employees participation in administration-Grievances- Institutional arrangements for settlement of disputes-Change in work place, Counseling and Time Management.

**CH.S.D.ST .THERESA'S AUTONOMOUS COLLEGE FOR WOMEN ,
ELURU.**

**II YEAR IV SEMESTER CERTIFICATE COURSE
ADDON COURSE PAPER- WOMEN IN INDIAN POLITICS**

UNIT-1

Introduction –objectives

Role of women in Freedom Movement

Movement of Right to Vote

UNIT-2

Role of women in politics after Independence

Women representation in Parliament

Women representation in different state legislatures

UNIT-3

Women representation in the union cabinet

Women representation in AP state ministerial council

UNIT-4

Women representation in local bodies after 73rd&74th constitutional amendments

Reservation for women in legislatures and Local bodies

UNIT-5

Various limits on woman's participation in Politics and their impact

National Women's Commission

State Women's Commission

Psychology

Syllabus 2022-23

PAPER TITLES

	Semester	Paper	Title of the Paper
I Year	I	Paper I	General Psychology
	II	Paper II	General Psychology
II Year	III	Paper III	Child Psychology
	IV	Paper IV	Social Psychology
		Paper –V	Psychopathology (abnormal behavior)
III Year	V	Paper VI(A)	Educational psychology
		Paper VII(A)	Educational psychology - applications and skills

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN,ELURU

I BA PSYCHOLOGY

I SEMESTER PAPER I SYLLABUS 2022-23

TITLE: GENERAL PSYCHOLOGY

UNIT-I: Introduction

- A) Historical foundations of Psychology: Definition, Nature and Scope of Psychology; Schools and fields of psychology.
- B) Methods of Psychology- Introspection, Observation, Case Study, Interview, Survey and Experimental Method

UNIT-II: Biological Basis of Behavior

- A) Neuroanatomy - Structure of the neuron; The Autonomic Nervous System-Structure & function; The Central Nervous System: Spinal cord - structure and function; The Brain - hindbrain, midbrain & forebrain.
- B) Hormones and Behavior-Main endocrine glands, their hormone products and principal effects of the hormones - Mechanisms of Heredity and Environment

UNIT-III: Attention and Perception

- A) Types and determinants of Attention, Distraction, Division, Fluctuation and Span of attention
- B) Perception- Perceptual constancies, illusions, Organizational factors of perception.

UNIT-IV: Motivation and Emotion

- A) Motivation – Definition and types of motives- Bio and Psycho- Social Motives, Theories of motivation- Maslow's Theory of Motivation and Freud's Unconscious Motivation. B) Emotions – Definition and Nature of Emotions, Types of emotions, Theories of emotions James- Lange, Cannon-Bard

UNIT – V:

Personality : Definition ,meaning , nature, approaches to personality –Type , Behaviouristic, Humanistic and Psychosexual approaches,Projective techniques

.REFERENCE BOOKS:

1. Morgan, Clifford.T., King, Richard.A., Weisz,John.R., Schopler, John (1993). Introduction to Psychology, TataMcGraw Hill.
2. Marx, Melvin H. (1976). Introduction to Psychology - Problems, Procedures & PrincipleMacMillan Publishing Co.
3. Hilgard, E.R., Atkinson, R.L., Atkinson, R.C., (1979): Introduction to Psychology,

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN,ELURU

I BA PSYCHOLOGY

II SEMESTER PAPER II SYLLABUS 2022-23

TITLE: GENERAL PSYCHOLOGY

UNIT-I: Learning

- A) Definition of learning - Classical conditioning, Operant Conditioning, Learning by insight and observation, Latent learning.
- B) Role of motivation and maturation in learning, Reward and Punishment, Learning curves, Efficient methods of learning, Transfer of learning.

UNIT-II: Memory and Forgetting

- A) Meaning and types of Memory, Methods of measuring memory, Information processing Model of Memory.
- B) Forgetting- meaning, nature and causes; Methods to improve memory

UNIT-III: Thinking

- A) Definition, Mental Images, Concepts, Reasoning- Deductive and Inductive Reasoning.
- B) Problem Solving- Impediments to Problem Solving.
- C) Creative thinking- Meaning and stages of creative thinking, Characteristics of Creative People.

UNIT-IV: Intelligence

- A) Intelligence Definition- Theories: Spearman Two Factor Theory, Thurstone's Multi Factor Theory and Sternberg's Triarchic Theory of Intelligence
- B) Measurement of Intelligence- Concept of IQ, Types of Intelligence tests, Intellectually gifted and Retardation.
- C) Role of heredity and environment in intelligence

UNIT-V: Aptitude and Interest

- A) Meaning-Nature of aptitude, ability, achievement.
- B) Difference between Intelligence and Aptitude, Aptitude and Interest.
- C) Measurement of Aptitude –Utility of Aptitude tests.

REFERENCE BOOKS:

1. Morgan, Clifford.T., King, Richard.A., Weisz, John.R., Schopler, John (1993): Introduction to Psychology, TataMcGraw Hill.
2. Marx, Melvin H. (1976) Introduction to psychology - Problems, Procedures & Principles, MacMillan Publishing Co.
3. Hilgard, E.R., Atkinson, R.L., Atkinson, R.C., (1979): Introduction to Psychology, Harcourt

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN,ELURU

II BA PSYCHOLOGY

III SEMESTER PAPER III SYLLABUS 2022-23

TITLE: CHILD PSYCHOLOGY

UNIT-I

Introduction, importance of developmental psychology

Meaning, nature and importance of developmental psychology

UNIT-II

Growth and development

Concept of growth and development/ Principles of development. Stages of human life span. Methods of studying human development. Factors influencing growth and development:- Heredity and environment.

Early Stages of Development.

UNIT-III

Prenatal Period: Characteristics, Importance of conception. Prenatal stages, factors influencing prenatal development , Hazards.

UNIT-IV

Infancy: Characteristics , adjustments in infancy , conditions influencing postnatal life (pre maturity, multiple births, post maturity)- physical development ,activities-sensitivities / and capacity for learning / emotions of the infants / Hazards.

UNIT-V

Babyhood:

Characteristics, developmental tasks, physical development, physiological functioning, muscle control, speech development, emotional behavior, social typing and family relations , personality development Hazards.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN,ELURU

II BA PSYCHOLOGY

IV SEMESTER

PAPER IV SYLLABUS 2022-23

TITLE: SOCIAL PSYCHOLOGY

UNIT-I

Nature and Scope of Social Psychology: Definition, Nature and Scope. Importance of social psychology .

UNIT-II

Methods of Social Psychology - Observation method, Survey method, Correlational method, Field study and Experimental method.

UNIT-III

Social Perception (Understanding Others):

Attribution – Theories of Attribution :-Theory of Correspondent Inference, Kelly's theory of causal attribution, Errors in Attribution – Fundamental Attribution Error, Actor- Observer effect, Self Serving Bias. Impression formation and Impression Management – Techniques of Impression Management.

UNIT-IV

Communication: Definition, nature and types of communication. Barriers of effective Communication.

UNIT-V

Attitudes: Definition, Distinctive features of Attitudes, Formation of Attitudes, Measurement of Attitudes – Likert of Summated ratings, Bogardus method of Social Distance, Thurstone's Equal appearing intervals method. Cognitive Dissonance, Reducing Dissonance.

CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR WOMEN,ELURU

II BA PSYCHOLOGY

IV SEMESTER PAPER-V SYLLABUS 2022-23

TITLE: PSYCHOPATHOLOGY (ABNORMAL BEHAVIOR)

UNIT-I

Introduction to Abnormal Psychology: Defining abnormality. Abnormal psychology – past and present views and treatments. Approaches to psychopathology – psychodynamic, behavioral, cognitive behavioral, existential and biological.

UNIT-II

Classification and Causes of Abnormal: Classification of disorders - Etiological factors in abnormality - Stress, coping and the ego- defense mechanisms.

UNIT-III

Anxiety Disorders – Nature and Symptoms: Generalized anxiety disorder - Phobias - Panic and panic disorders - Obsessive – compulsive disorder - Post – traumatic stress disorder.

UNIT-IV

Somatoform Disorders Nature and Symptoms: Conversion disorders – with motor/ sensory symptoms or deficits, with seizures. Pain disorders – headache, migraine, low back pain, etc, Acute versus chronic pain, cognitive perception of pain, individual differences in reaction to pain/ Hypochondriasis.

UNIT-V

Dissociative Disorders Nature and Symptoms: Amnesia and fugue - Dissociative identity disorder.

III B:A Psychology

SEMESTER - V SYLLABUS 2022-23

TITLE: Paper:- 6(A) Educational Psychology

1. Understanding the meaning and processes of educational psychology
2. Demonstrating an appreciation of various theoretical perspectives on cognition and learning in educational contexts.
3. Developing insights into the facilitators of learning such as intelligence, emotion, imagination, creativity and self processes.
4. Understanding the phenomena of transfer of learning and its applications.

UNIT I: Introduction

A. Educational Psychology: Definition, Nature, Scope and importance.

B. Methods of educational psychology- Classroom Observation -Observation Schedule preparation. Experimental method -Group Experimentation, Survey method-Survey Schedule preparation.

UNIT II: Learning Process

A. The nature of learning process: Nature of learning – and Role of maturation

B. The process of learning -learning curves - plateaus in learning - Demonstration of learning curves

UNIT III: Theories and Laws of Learning

A. Theories and laws of learning and their educational implications: trial and error learning - learning by conditioning – learning by insight

B. Learning of skills - Role of motivation, attention and interest in learning – kinds of motivation: extrinsic and intrinsic, achievement motivation – Methods of motivating pupils to learn.

UNIT IV: Transfer of Learning

A. Transfer of Learning: Forms of transfer – theories of transfer of learning – factors

influencing transfer of learning.

B. Transfer of Verbal and motor learning, Distribution of practice, knowledge of results.

UNIT V: Individual Differences in Personality- Educational implications

A. Personality- Nature and Educational Implications

B. Types of personality –Type and Trait approaches

C. Assessment of personality- Questionnaires, Inventories, Rating Scales, Projective techniques

D. Role of School and Education in development of personality

References:

1. S.K. Mangal (1982). Educational psychology. Prakash Brothers Educational publications, Ludhiana.
2. H.R. Bhatia (1977) A text book of educational psychology Macmillan India Ltd.
3. S.N. Rao. (1990) Educational psychology. Wiley eastern Limited.

**CH.S.D.ST.THERESA'S AUTONOMOUS DEGREE COLLEGE FOR
WOMEN,ELURU**

SEMESTER - V SYLLABUS 2022-23

**TITLE: Paper:- Course No: 7(A) Course Name: Educational Psychology-
Applications and Skills**

I. Learning Outcomes

1. Understanding Learning Disabilities, identification and role of teacher in facilitating education.
2. Identifying the mental health factors influencing learning process.
3. Understanding the impact of various skills on students' learning.
4. Appreciation for various behaviour modification methods to facilitate learning.

II. Syllabus (Total Hours-90 Including Teaching, Lab, Field Training, Internal Tests etc.,)

Unit-I: Learning Disabilities:

- A. Learning Disabilities: Concept, Definition, Meaning,
- B. Characteristics and Types of learning disabilities (HI, MR, ASD)
- C. Identification of Learning Disabled Children. Approaches and Techniques,
- D. Role of teachers in facilitating education to learning disabled.

Unit-II: Adjustment and Wellbeing

Adjustment and Psychological well-being. Factors influence and promote adjustment and quality of life. Goal setting, self- concept, creativity and, optimistic life style.

Stressors- examination anxiety, bullying, parental expectations, peer pressure and competition

Unit III: Assessment of skills for learning

- A. Study skills and habits- Meaning, nature, development and impact on academic success
- B. Role of Emotional Quotient and Social Quotient in education

Unit-IV : Behaviour Modification in Education

- A. Behavioural problems and their identification- Absenteeism, dropouts, under achievement
- B. Behaviour modification – Meaning and its application. Positive reinforcement, Negative Reinforcement, Punishment, Systematic desensitization, Token Economies and Extinction.

Unit V: Counselling and Guidance in Education

- A. Meaning and Scope educational counselling and guidance in education
- B. Types of counselling- Individual and group counselling
- C. Counselling Skills

Reference

- Chauhan,S.S.(2004). Advanced Educational Psychology, Vikas Publishing Pvt. Ltd., Shimla.
- Mangal, S.K. (1999). Advanced Educational Psychology and Research. Prakash Brothers Educational publications, Ludhiana.
- Nagaraju et al (2019) Learning Assessment. Neelkamal Publications, Hyderabad.
- Dubois, Alverson and Staley. (1998) Educational Psychology and Instructional Decisions.The Dorsey Press, Illinois USA.

DEPARTMENT OF SOCIAL SCIENCES

SOCIAL WORK SYLLABUS 2022-2023

PAPER TITLES

Year I	Semester I	Paper I	<i>SOCIAL WORK PROFESSION, PHILOSOPHY AND BASIC SOCIAL SCIENCES CONCEPTS</i>
	Semester II	Paper II	SOCIAL WORK METHODS
Year II	Semester III	Paper III	SOCIALWORKWITH WOMEN AND CHILDREN
Year II	Semester IV	Paper IV	NON - GOVERNMENTAL ORGANIZATION
	Semester IV	Paper V	SOCIALPROBLEMS AND SOCIALLEGISLATIONS
Year III	Semester V	Paper VI A	COUNSELLING SKILLS IN SOCIAL WORK
		Paper VI B	SOCIAL WORK PRACTICE WITH DIFFERENTLY- ABLED PERSONS

CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU

I BA SOCIAL WORK I SEMESTER PAPER -I SYLLABUS

***TITLE: SOCIAL WORK PROFESSION, PHILOSOPHY AND BASIC
SOCIAL SCIENCES CONCEPTS***

UNIT I:

History of Social Work: Historical background of social work in UK and India

UNIT II:

Social Work: concept, nature and definition of social work, scope of social work, social work as a profession.

UNIT III:

Groups and Communities: definition, of groups characteristics and types of groups
Community definition, characteristics and types of community.

UNIT IV:

Social stratification: caste and class, Social inequality, Social exclusion, social Inclusion

UNIT V:

Understanding human behavior: Stages of human development, importance of heredity and environment, motivation, perception, personality, factors influencing on personality.

CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU

I BA SOCIAL WORK II SEMESTER SYLLABUS

TITLE: SOCIAL WORK METHODS

UNIT I:

Working with Individuals: Case Work- concept and definition, historical development of case work in India. Values and Principles of case work, components of case work – person place, problem. Role of social worker in case work setting – family, school, hospitals, industries and correctional institutions.

UNIT II:

Working with groups: Group work –Concept and definition of social group work historical development, principles, values and skills of group work. Use of group work technique in different fields of social work such as correctional settings, schools and communities. Group dynamics, leadership, conflict and communication.

UNIT III:

Community Organization: Definition and scope. Community organization as a method of social work. Its relation to other methods of social work. Principles and skills of community organization- resource mobilization, conflict resolution, organizing meetings, report writing, documentation and networking.

UNIT IV:

Social Action: Meaning definition, scope and principles of social action, various techniques and stages of social action. Social awareness, financial resources, bill drafting and legislation.

UNIT V:

Social work research: Meaning and scope differences between social work research and social research, stages of social work research. Sampling- definition, types of sampling, advantages and disadvantages of sampling, universe tools of data collection, questionnaire, interview schedule, observation etc.; data analysis and report writing.

CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU
II BA SOCIAL WORK III SEMESTER
SYLLABUS TITLE: SOCIALWORKWITH WOMEN AND CHILDREN

UNIT I

Role and Status of Women in India: Changing perspectives of the role and status of women in India - Their status in the context of family, marriage, religion and economy.

UNIT II:

Concept of gender: Concept of Gender; Gender Inequalities Constitutional provisions and programmes pertaining to women in India

UNIT III:

Violence against Women: Domestic violence - Legislations such as Dowry Prohibition Act; 1961 (Amended - 1984), Prevention of Domestic Violence Act 2005, Pre-Natal diagnostic techniques (regulation and misuse) Act, 1994

UNIT IV:

Child: Concept, definition, influence of heredity and environment - family, peer group, neighborhood and social - street children, child labor, neglected and abused children and their problems. Institutional and non-institutional service for children

UNIT V:

Programmes for Women and Children - Child Nutrition ICDS, Child Line, SHGs, Role of Social Worker in Family Counselling Centers, marital counselling centers and child guidance clinics

***CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU
II BA SOCIAL WORK IV SEMESTER SYLLABUS PAPER - IV***

TITLE: NON - GOVERNMENTA ORGANIZATION

UNIT I:

Non-Governmental Organizations: Concept, Meaning and Types,
Relationship of NGOs with government

UNIT II:

Promotion and Formation of NGOs: Voluntary action - Concept and trends,
A.P. Societies Registration Act, 2001 - Features and steps

UNIT III:

Management of the NGOs: General Body, Executive Committee, Roles and
functions.

UNIT IV:

Financial Management: Sources of Finance - Governmental and Non-
Governmental; methods of resource mobilization. Corporate Social
Responsibility (CSR)

UNIT V:

Project Management: Formulating a project, preparing an Organizational Budget,
significance . project Reporting.

***CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU
II BA SOCIAL WORK IV SEMESTER SYLLABUS PAPER - V***

**TITLE: SOCIAL PROBLEMS AND SOCIAL
LEGISLATIONS**

UNIT I:

Definition of Social deviance, meaning and Nature of social disorganization and causes of social problems.

UNIT - II

Study and analysis of specific social problems such as crime, juvenile delinquency, prostitution, alcoholism, drug addition, untouchability, women related specific social problems such as dowry, female feticide and infanticide.

UNIT - III

Social Legislation related to crime, juvenile delinquency, prostitution, alcoholism and drug addiction, dowry, untouchability and female feticide, domestic violence

UNIT - IV

The preventive and remedial services available at the Government and Non-Governmental level to deal with problems mentioned above

UNIT - V

A critical study of models of preventive and remedial work with reference to the role of social work profession. Formulation of research projects to study social problems

***CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU
III BA SOCIAL WORK IV SEMESTER SYLLABUS PAPER – VI A***

COUNSELLING SKILLS IN SOCIAL WORK

Unit: 1

Introduction to counselling skills in social work

Meaning, definition, principles and goals of counselling. Preventive, crisis, facilitative and developmental concepts of counselling.

Unit: 2

Counselling process in social work

Problem exploration and classification, dynamic self–understanding, developing a new perspective, values and ethics in counselling.

Unit: 3

Practice of counselling in different settings Case studies

Practice of counselling in family counselling centers, family courts, counselling bureau.

Unit: 4

Counselling techniques in social work

Initiating contact, intake, establishing, structure, behavior, interaction, observation, responding, rating and interpretation.

Unit: 5

Approaches for counselling in social work

Psycho-analytical theory, rational-emotive therapy, help and self-help, marital and family therapy.

***CH.S.D.ST. THERE'S COLLEGE FOR WOMEN (A) ELURU
III BA SOCIAL WORK IV SEMESTER SYLLABUS PAPER – VII A***

SOCIAL WORK PRACTICE WITH DIFFERENTLY-ABLED PERSONS

Unit: 1

Social work with differently abled persons

Introduction, definition of disability, discrimination over differently abled.

Unit: 2

Types and causes for disability

Types of disability, causes, magnitude, assessment, impairment and the final impact.

Unit: 3

Needs and problems of differently abled, problems of disability

Physical, mental, reproductive and sexual disability dependence and flattering self-esteem.

Unit: 4

Psychological disability Institutional and non Institutional services for the disability

Self thinking, decision making, unconditional thoughts and unparalleled behavior.

Unit: 5

Cure and treatment

Therapy, animal therapy, drama therapy, dance, music and role of a social worker in curing the differently abled.

**DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT
COURSE STRUCTURE (I, II, III, IV, V, VI, VII & VIII SEMESTERS)**

SEMESTER -I

S.No.	COURSE TITLE	CODE	Teaching Hrs/Week	TO
1	English	20ENFCEP13	4	
2	Fundamentals of Agronomy	AGRO101	2	
	Fundamentals of Agronomy-Practical	AGRO101P	2	
3	Fundamentals of Plant Biochemistry and Soil Science	BICM101	2	
	Fundamentals of Plant Biochemistry and Soil Science-Practical	BICM101P	2	
4	Fundamentals of Agriculture Economics	AECO141	2	
5	Fundamentals of Horticulture	HORT181	2	
	Fundamentals of Horticulture-Practical	HORT181P	2	
6	Rural Sociology, Educational Psychology and Human Values	AEXT 191	2	
7	HVPE (LSC)	20LSCHP2	2	
8	Vermicompost Production (SDC)	20SDCVP2	2	
9	MSPA	CERMA	2	
10	Extracurricular activities		1	

MSPA: Minimum Supporting Price for Agriculture crops in Andhra Pradesh

SEMESTER-II

S.No.	COURSE TITLE	CODE	Teaching Hrs/Week
1	English	20ENFCEP23	4
2	Introductory Agrometeorology and Climate Change	AGRO 103	2
	Introductory Agrometeorology and Climate Change-Practical	AGRO 103P	2
3	Fundamentals of Genetics	GPBR 111	2
	Fundamentals of Genetics-Practical	GPBR 111P	2
4	Fundamentals of Entomology-1	ENTO 131	2
	Fundamentals of Entomology-1-Practical	ENTO 131P	2
5	Soil and Water conservation engineering	AENG 151	2
	Soil and Water conservation engineering-Practical	AENG 151P	2
6	Fundamentals of Plant Pathology –I	PATH 171	2
	Fundamentals of Plant Pathology –I-Practical	PATH 171P	2
7	Basic Computer Applications (LSC)	20LSCCA2	2
8	Zero Budget Natural Farming (ZBNF) (SDC)	20SDCZN2	2
9	SEED BED PREPARATION	CERSB	2
10	Community Service	20CSP4	120Hrs/Sem

ZBNF: Zero Budget Natural Farming**SEMESTER-III**

S.No.	COURSE TITLE	CODE	No. of	
			Teaching Hrs/Week	Total CREDITS
1	Crop Production Technology	AGRO 201	2	3
	Crop Production Technology – Practical	AGRO 201P	2	
2	Fundamentals of Plant Breeding	GPBR 211	2	3
	Fundamentals of Plant Breeding-Practical	GPBR 211P	2	
3	Fundamentals of Entomology II	ENTO 231	1	2
	Fundamentals of Entomology II -Practical	ENTO 231P	2	
4	Fundamentals of Plant Pathology II	PATH271	1	2
	Fundamentals of Plant Pathology II-Practical	PATH271P	2	
5	Farm Machinery and Power	AENG 251	1	2
	Farm Machinery and Power-Practical	AENG 251P	2	
6	Production Technology for Vegetables and Spices	HORT 281	1	2
	Production Technology for Vegetables and Spices-Practical	HORT 281	2	
7	Agricultural Finance and Co-operation	AECO 241	1	2
	Agricultural Finance and Co-operation-Practical	AECO 241P	2	
8	Fundamentals of Agricultural Extension	AEXT 291	2	3
	Fundamentals of Agricultural Extension-Practical	AEXT 291-P	2	
9	Economics for Rural Development	AERD201	2	2
10	Eco-physiology	CPHY 261	1	2
	Eco-physiology-Practical	CPHY 261P	2	
11	Environmental Science (LSC)	20LSCEE2	2	2
12	Bee Keeping (SDC)	20SDCBK2	2	2
13	Yoga		4	2
				29

SEMESTER-IV

S.No.	COURSE TITLE	CODE	No. of	
			Teaching Hrs/Week	T CRI
1	Crop Production Technology – II (Oilseeds, Fibre, Sugar, Tobacco and Fodder crops)	AGRO 202	2	
	Crop Production Technology – II -Practical	AGRO 202P	2	
2	Irrigation water management, farming systems and sustainable agriculture	AGRO 203	2	

	Irrigation water management, farming systems and sustainable agriculture-Practical	AGRO 203P	2	
3	Agriculture Marketing, Trade, Prices	AECO 242	2	
	Agriculture Marketing, Trade, Prices-Practical	AECO 242P	2	
4	Manures, Fertilizers and Soil Fertility Management	SSAC 221	2	
	Manures, Fertilizers and Soil Fertility Management-Practical	SSAC 221P	2	
5	Production Technology for Ornamental Crops, Medicinal and Aromatic Plants and Landscaping	HORT 282	1	
	Production Technology for Ornamental Crops, Medicinal and Aromatic Plants and Landscaping-Practical	HORT 282P	2	
6	Entrepreneurship Development and Business Communication	AEXT 292	1	
	Entrepreneurship Development and Business Communication-Practical	AEXT 292P	2	
7	Renewable energy and Green Technology	AENG 252	1	
	Renewable energy and Green Technology-Practical	AENG 252P	2	
8	Live-stock and Poultry Management	LSPM 201	2	
	Live-stock and Poultry Management-Practical	LSPM 201P	2	
9	Statistical Methods	SMCA 201	1	
	Statistical Methods-Practical	SMCA 201P	2	
10	Rural Development Planning and Management	PMRD202	2	
11	Entrepreneurship and Development (LSC)	20LSCED2	2	
12	Mushroom Cultivation (SDC)	20SDCMC2	2	
13	Summer Internship Project			

SEMESTER-V

S.No	COURSE TITLE	CODE	Teaching Hrs/Week	C
1	Geo informatics and Nanotechnology for Precision Farming and Practical Crop Production	AGRO 301	2	
	Geo informatics and Nanotechnology for Precision Farming and Practical Crop Production-Practical	AGRO 301P	2	
2	Environmental Studies and Disaster Management	CPHY361	1	
	Environmental Studies and Disaster Management -Practical	CPHY361P	2	
3	Principles of Food Science and Nutrition	BICM 300	2	
	Principles of Food Science and Nutrition-Practical	BICM 300P	2	
4	Crop Improvement - I (<i>Cereals, Millets, Pulses and Oilseeds</i>) and Intellectual Property Rights	GPBR 311	2	
	Crop Improvement - I (<i>Cereals, Millets, Pulses and Oilseeds</i>) and Intellectual Property Rights-Practical	GPBR 311P	2	
5	Problematic Soils and their Management	SSAC 321	1	
	Problematic Soils and their Management-Practical	SSAC 321P	2	
6	Protected Cultivation and Post-harvest technologies	AENG 351	1	
	Protected Cultivation and Post-harvest technologies-Practical	AENG 351P	2	
7	Pests of Field crops and Stored Grain and their Management	ENTO 331	2	
	Pests of Field crops and Stored Grain and their Management-Practical	ENTO 331P	2	

8	Diseases of Field and Horticultural Crops and their Management - I (Field Crops)	PATH 371	2	
	Diseases of Field and Horticultural Crops and their Management - I (Field Crops)-Practical	PATH 371P	2	
9	Principles of Integrated Pest and Disease Management	PATH 372	1	
	Principles of Integrated Pest and Disease Management-Practical	PATH 372P	2	
10	Rural Industrialization and Entrepreneurship	RERD 303	2	

SEMESTER-VI

S.No.	COURSE TITLE	CODE	Teaching Hrs/Wk
1	Rain fed Agriculture, Watershed Management and Principles of Organic Farming	AGRO 303	2
	Rain fed Agriculture, Watershed Management and Principles of Organic Farming-Practical	AGRO 303P	2
2	Agriculture Informatics	SMCA 301	1
	Agriculture Informatics-Practical	SMCA 301P	2
3	Crop Improvement-II (<i>Fibre, Sugar, Starches, Narcotics, Vegetables, Fruits and Flowers</i>) and Principles of Seed Technology	GPBR 312	2
	Crop Improvement-II (<i>Fibre, Sugar, Starches, Narcotics, Vegetables, Fruits and Flowers</i>) and Principles of Seed Technology-Practical	GPBR 312P	2
4	Pest of Horticultural Crops and their Management and Beneficial insects	ENTO 332	2
	Pest of Horticultural Crops and their Management and Beneficial insects-Practical	ENTO 332P	2
5	Diseases of Field and Horticultural Crops and their Management - II (Horticultural Crops)	PATH 372	1
	Diseases of Field and Horticultural Crops and their Management - II (Horticultural Crops)-Practical	PATH 372P	2
6	Post-harvest Management and Value Addition of Fruits and Vegetables	HORT 381	1
	Post-harvest Management and Value Addition of Fruits and Vegetables-Practical	HORT 381P	2
7	Communication Skills and Personality Development	AEXT 391	1
	Communication Skills and Personality Development-Practical	AEXT 391P	2
8	Farm Management, Production and Resource Economics	AECO 341	1
	Farm Management, Production and Resource Economics-Practical	AECO 341P	2
9	Agriculture Microbiology	AMBE 373	1
	Agriculture Microbiology-Practical	AMBE 373P	2
10	Fundamentals of Plant Biotechnology	BICM302	1
	Fundamentals of Plant Biotechnology-Practical	BICM302P	2

SEMESTER-VII**Rural Agricultural Work Experience (RAWE) and Agro-Industrial Attachment (AIA)**

S.No.	COURSE TITLE	CODE	SEM
1	Rural Agricultural Work Experience (RAWE) and Agro-Industrial Attachment (AIA)	<u>RAWE</u>	VI
	Crop Production	R	
	Crop Protection		
	Rural Economics		
	Extension Programme		
	Research Station / KVK /DAATT Centre activities and attachment to Agro based industries	A	
		W	
		E	

SEMESTER-VIII

S.No.	COURSE TITLE	CODE	SEM	CREDITS	THEORY	LAB
1	AELP-Agriculture Experiential Learning Programme	AELP	VIII	20	0	20

Dept. of Agriculture and Rural Development, Course total Credits

S.No.	Discipline	No. of Credits	Total Credits
01	Agriculture core Papers	164	164
02	English	6 (I&II SEM)	6
03	SDC	8 (I,II,III&IV SEM)	8
04	LSC	8 (I,II,III&IV SEM)	8
05	Certificate course	2 (I&II SEM)	2
06	Yoga	2	2
07	Extracurricular activity	2	2
08	Community service	4	4
09	Summer internship	4	4
TOTAL CREDITS			196+4

SYLLABUS

Subject: Agriculture and Rural Development Semester: I
Course Title: Minimum Supporting Price for Agriculture Crops in AP
Course Code: CERMS
No. of Hours: 30 Hrs. Credits: 1

PRACTICAL

UNIT-I: (6 Hours)

1. Introduction to MSP - History, definition
2. Brief description on MSP in AP

UNIT-II: (6 Hours)

1. Determination of MSP in Agricultural Crops
2. Determination of MSP in Horticultural Crops

UNIT-III: (6 Hours)

1. Daily Determination of MSP in Krishna district

UNIT-IV: (6 Hours)

1. Role of MSP in Indian Economy

UNIT-V: (6 Hours)

1. Role of MSP in AP Economy

Reference Text Books:

1. Budget 2018 on Agriculture: Can new MSP prop up rural economy? - Live mint.
2. Jump up to:^{a b} "CACP". cacp.dacnet.nic.in. Commission for Agricultural Costs and Prices. Retrieved 24 September 2020.
3. Budget 2018: Focus on MSP ideal for tackling farm distress - The Economic Times.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Vermicompost Production

Course Code: 20SDCVP2

No. of Hours: 30 Hrs.

Credits: 2

PRACTICAL

UNIT-I: (6 Hours)

1. Introduction to Vermicompost - History, definition
2. Brief description methods of preparation of vermicompost

UNIT-II: (6 Hours)

1. Procedure for preparation of vermicompost by step by step
2. Materials used for vermicompost bed of greenhouses

UNIT-III: (6 Hours)

1. Maintenance of vermicompost bed

UNIT-IV: (6 Hours)

1. Nutrient value for vermicompost

UNIT-V: (6 Hours)

1. Advantages and Disadvantages in Vermicompost.

Reference Text Books:

1. Kurien, J., and Ramasamy, E.V. 2006. Vermicomposting of Taro (*Colocasia esculenta*) with two epigeic earthworm species. *Bioresource Technology* 97(11):1324-1328.
2. Monroy, F., Aira, M., Dominguez, J., and Velando, A. 2006. Seasonal population dynamics of *Eisenia fetida* (Savigny, 1826) (Oligochaeta, Lumbricidae) in the field. *Comptes Rendus Biologies* 329(11):912-915.
3. Nair, J., Sekiozoic, V., and Anda, M. 2006. Effect of pre-composting on vermicomposting of kitchen waste. *Bioresource Technology* 97(16):2091-2095.
4. Suthar, S. 2006. Potential utilization of guar gum industrial waste in vermicompost production. *Bioresource Technology* 97(18):2474-2477.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Fundamentals of Agriculture Economics

Course Code: AECO141

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6 Hrs.)

1. Economics – meaning – definitions – subject matter of economics – traditional approach
 - a. consumption, production, exchange and distribution
2. Modern approach – microeconomics and macroeconomics – methods of economic
 - a. investigation – deduction and induction
3. Agricultural economics – definitions – meaning – importance of agricultural economics – branches of agricultural economics
4. Agricultural production economics – meaning – definitions – subject matter – objectives; Farm management – meaning – scope – definitions – objectives
5. Agricultural finance – meaning – definitions – micro vs macro finance – need for agricultural finance; Agricultural marketing – meaning – definition – importance of agricultural marketing
6. Basic terms and concepts in economics – goods and services – free and economic goods, utility – cardinal and ordinal approaches – characteristics of utility – forms of utility

UNIT-II: (6 Hrs.)

1. Value – definition – characteristics; price – meaning; wealth – meaning – attributes of wealth – types of wealth – distinction between wealth and welfare; Wants – meaning characteristics of human wants
2. Law of diminishing marginal utility – statement – assumptions of law – explanation – limitations of the law – importance
3. Law of equi-marginal utility – meaning – assumptions – explanation of the law – limitations of the law – practical importance

4. Consumer's surplus – meaning – assumptions – explanation – difficulties in measuring consumer's surplus – importance
5. Demand – meaning – definition – types of demand – income demand, price demand and cross demand
6. Demand schedule – demand curve – Law of demand – contraction and extension, increase and decrease in demand

UNIT-III: (6 Hrs.)

1. Elasticity of demand – meaning – elastic and inelastic demand – kinds of elasticity of demand – perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic and unitary elastic demand
2. Price elasticity – income elasticity and cross elasticity of demand – practical importance of elasticity of demand
3. Supply – meaning – definition – Law of supply – supply schedule – supply curve
4. Increase and decrease in supply – contraction and extension of supply – factors affecting supply
Elasticity of supply – kinds of elasticity of supply – perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic and unitary elastic – factors affecting elasticity of supply
5. Price determination – equilibrium price and quantity – determination of market price
6. Markets – definition – essentials of market – classification of market structure – perfect and imperfect markets

UNIT-IV: (6 Hrs.)

1. Characteristics of monopolistic competition – monopoly and oligopoly
2. National income – concepts of national income – gross domestic product, gross national product, net national product, net domestic product – national income at factor cost, personal income, disposable income
3. Methods of measurement of national income – product method, income method and expenditure method
4. Public finance – meaning – role and importance of public finance – functions of the government – differences between public finance and private finance
5. Public revenue – meaning – major and minor sources of public revenue
6. Tax – meaning – classification – direct and indirect taxes – methods of taxation – proportional, progressive, regressive and degressive taxation, agricultural taxation – other types of taxation – Value Added Tax (VAT)
7. Canons of taxation – Adam Smith's canons of taxation – equality,

economy, certainty and convenience – other canons of taxation

UNIT-V (6 Hrs.)

1. Public expenditure – meaning – need for public expenditure – social and economic overheads, balanced regional growth, development of agriculture and industry, exploitation and development of mineral resources and subsidies and grants to provinces, local governments, and exporters
2. Principles of public expenditure – Principle of maximum social benefits Principle of economy, *i.e.*, wasteful expenditure should be avoided, Principle of sanction, *i.e.*, authorized expenditure, Principle of balanced budget, Canon of elasticity, *i.e.*, fairly flexible and Avoidance of unhealthy effects on production and distribution
3. Inflation – meaning – definition – related concepts of inflation – *deflation, disinflation, stagflation and reflation* – measurement of inflation - consumer price index, wholesale price index, producer price index and GDP deflator
4. Types of inflation – demand pull and cost push inflation – comprehensive and sporadic inflation – suppressed and repressed inflation – creeping, walking, running and galloping inflation – mark up inflation
5. Causes of inflation – factors causing increase in demand – increase in money supply, increase in disposable income, increase in public expenditure, increase in consumer spending, cheap monetary policy, deficit financing and increase in exports, factors causing shortage of supply – shortage of factors of production, industrial disputes, natural calamities, artificial scarcities, increase in exports, lop-sided production, Law of diminishing returns and international factors
6. Remedial measures to control inflation – monetary measures – credit control, demonetization of currency and issue of new currency – fiscal measures – reduction in unnecessary expenditure, increase taxes, increase in savings, surplus budgets and public debt.

References Text Books:

1. Dewett, K.K. and Chand, A. 1979. *Modern Economic Theory*.
2. S. Chand and Co., New Delhi. Dewett, K.K. and Varma, J.D. 1986. *Elementary Economics*.
3. S. Chand and Co., New Delhi. Jhingan, M.L. 1990. *Advanced Economic Theory*. Vikas

Publishing House, New Delhi.

SYLLABUS

Subject: Agriculture and Rural development

Semester: I

Course Title: Rural Sociology, Educational Psychology and Human Values

Course Code: AEXT191

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6Hrs.)

1. Sociology and rural sociology, extension education, agricultural extension - meaning and definitions
2. Importance of rural sociology in agricultural extension and their interrelationship
3. Characteristics of Indian, rural society - differences and relationships between rural and urban societies
4. Social group(s) - classification - formation and organization of groups role of social groups in agricultural extension
5. Social stratification - meaning - forms - class system and caste system

UNIT-II: (6Hrs.)

1. Culture and different cultural concepts and their role in agricultural extension
2. Social values, social control and attitudes types and their role in agricultural extension
3. Leadership - meaning - classification of leaders - roles of a leader and different methods in selection of a leader
4. Training of leaders - lay and professional leaders - advantages and limitations in using local leaders in agricultural extension
5. Psychology and educational psychology - meaning - scope and importance

UNIT-III (6Hrs.)

1. Intelligence - meaning - types - factors and importance in agricultural extension
2. Personality - meaning - types - factors and importance in agricultural extension
3. Perception, emotions, and frustration - meaning - types - factors and importance in agricultural extension,
4. Motivation - meaning - types of motives - theories of motivation importance of motivation in agricultural extension
5. Teaching, learning, learning experience and learning situation - meaning and definition -elements of learning situation and its characteristics

UNIT-IV: (6Hrs.)

1. Principles of learning and their implications in teaching - steps in extension teaching
2. Variety of moral issues (part-1): - Understanding the harmony in the society (society being an extension of the family), Integrity, work ethic, Courage, Empathy,
3. Variety of moral issues (part-2): -Self-confidence, Moral Autonomy, Concensus and Controversy, Professional and Professionalism, Professional idea, and virtues.
4. Principles of Ethics and Morality (part-1): - Ethics as a Subset of Morality, Ethics and Organization, Employee, Duties and Rights.
5. Principles of Ethics and Morality (part 2): Discriminatory and Pre-judicial employee practices, Understanding harmony in nature, Natural acceptance of human values.
6. Risk benefit analysis (part-1): - Reducing risk, the government regulators, approach to risk, handling ethical dilemmas at work.

UNIT-V: (6Hrs)

1. Risk benefit analysis (part-2): - Market strategy and ethics, ethical practice in marketplace, ethics in finance, ethics in business and environment.
2. Collegiality and loyalty (part-1): - Respect of authority, collective bargaining, confidentiality, professional rights.
3. Collegiality and loyalty (part-2): -Intellectual property rights, multinational corporation and ethical investing, computer and ethics, management patterns
4. Competence and professional ethics: -
 - I. Ability to utilize the professional competence and augmenting universal human order
 - II. Ability to identify the scope and characteristic people friendly and eco-friendly production

- III. Ability to identify and develop appropriate technologies and management and pattern for above production system
5. Strategy for transition from the present state to universal human order
- I. At the level of individual- as socially and ecologically responsible technologies and managers
- II. At the level of society- as mutually enriching institutions and organizations
6. Case studies of typical holistic technologies and management patterns.

References Text Books:

1. Adivi Reddy, A. 2001. Extension Education. Sri Lakshmi Press, Bapatla.
2. Chitamber, J.B. 1997. Introductory Rural Sociology. Wiley Eastern Limited, New Delhi.
3. Daivadeenam, P. 2002. Educational Psychology in Agriculture. Agrotech Publishing Academy, Udaipur.
4. Mangal, S.K. 2000. Educational Psychology. Prakash Brothers, Ludhiana.

SYLLABUS

Subject: Agriculture and Rural Development

Course Title: Fundamentals of Agronomy

No. of Hours: 30 Hrs.

Semester: I

Course Code: AGRO101

Credits: 2

UNIT-I: (6Hrs.)

1. Definition of agriculture – meaning and scope of agronomy
2. History and development of agriculture in ancient India – agriculture in civilization era
3. National and International Agricultural Research Institutes in India

4. Agro-climatic zones of India – soils, land use pattern, major sources of irrigation and ground water potential
5. Agro-climatic zones of Andhra Pradesh – soils, land use pattern, major sources of irrigation and ground water potential
6. Tillage and tilth – objectives of tillage – characteristics of ideal seed bed – effect of tillage on soil properties – pore space, texture, structure, bulk density and color of the soil

UNIT-II: (6Hrs.)

1. Types of tillage – preparatory tillage – factors affecting preparatory cultivation, after cultivation, puddling
2. Sowing – methods of sowing – time and depth of sowing for major agricultural crops – cereals, pulses and oilseeds
3. Crop stand establishment – factors affecting optimum stand establishment
4. Planting geometry – competition – types of competition, intra and inter plant competition – plant population – effect of plant population on growth and yield – optimum plant density and planting pattern
5. Soil fertility – soil fertility and soil productivity – fertility losses – maintenance of soil fertility – soil organic matter
6. Weed control – definition of weed – losses and uses of weeds – weed influence on crop production – methods of weed control

UNIT-III: (6Hrs.)

1. Irrigation management – importance of irrigation – objectives of irrigation – methods of irrigation – drainage and its advantages
2. Cropping systems – monocropping – definition and principles of crop rotation – mixed cropping – intercropping – relay cropping – multistoried cropping – sole cropping and sequence cropping
3. Harvest maturity symptoms and harvesting of major agricultural crops – rice, maize, groundnut, sugarcane and pulses – maturity indices, method of harvesting, threshing and winnowing – harvest index
4. Introduction - weed definition - harmful and beneficial effects of weeds
5. Classification of weeds – classification based on morphology – life cycle – habitat – origin – association – special features and soil pH with examples.

6. Propagation of weeds – sexual – asexual – vegetative reproduction – dispersal of weed seeds and fruits – dispersal agents – wind and water – animal – man – manures – farm implements and silage – dispersal of vegetative propagules

UNIT-IV: (6Hrs.)

1. Weed Biology – characteristic features of weeds – weed ecology – definition – persistence of weeds climatic – edaphic and biotic factors – crop weed association with some important crops like rice, maize, wheat, jowar, pulses, groundnut, sugarcane, cotton and tobacco.

2. Crop -weed competition - principles – factors - critical period of crop-weed competition - allelopathy.

3. Methods of weed management – preventive weed control measures – physical / mechanical, cultural,

4. Chemical and biological methods of weed control – bioherbicides - integrated weed management

5. Herbicides – definition - advantages and limitations of herbicide usage in India- classification of herbicides based on chemical nature - time and method of application

6. Classes of herbicides based on – selectivity – spectrum – translocation – residual nature – soil sterilants and fumigants – types of formulations.

7. Nomenclature of herbicides - commonly available herbicides in India – adjuvants -definition, their use in herbicides application. - surfactants - stabilizing agents - solvents - humificants - stickers - activators - compatibility agents - drift control agents etc.

UNIT-V: (6Hrs.)

1. Mode of action of herbicides – important biochemical modes of action of herbicides interfering with photosynthetic reactions – respiration -enzymatic inhibition etc – effects of sub lethal doses of herbicides on plants

2. Selectivity of herbicides – fundamental principles of selectivity - differential rate of absorption - differences in morphology and growth habit of plants - rate of translocation.

3. Selectivity of herbicides - differential rate of deactivation of herbicides – metabolism - reverse metabolism – conjugation - protoplasmic resistance to the specific herbicide

4. Weed management in different crops and cropping systems – rice – nursery – upland rice – low land rice – wheat – sorghum – maize – red gram – black gram – groundnut – sunflower.
5. Weed management in different crops and cropping systems – sugarcane – cotton - tobacco, Vegetables (tomato, onion, chilli and brinjal) and Orchards (mango, banana and citrus).
6. Our Journey in Agriculture and Vision for the Future
7. Traditional and Technically knowledge of agricultural crops

References Text Books:

1. Yellamanda Reddy, T. and Sankara Reddy, G.H. 2010. Principles of Agronomy. Kalyani Publishers, Ludhiana.
2. Crafts, A.S. and Robbins, W.W. 1973. Weed Control. *Tata McGraw-Hill Publishing Co. Ltd.*, New Delhi.
3. Gupta, O.P. 1984. Scientific Weed Management. Today and Tomorrow Printers and Publishers, New Delhi.
4. Gupta, O.P. 2004. Modern Weed Management. Agro Bios (India), Jodhpur.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Fundamentals of Horticulture

Course Code: HORT181

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6Hrs.)

1. Definition of Horticulture - Division of Horticulture - Pomology, Olericulture, Floriculture, spices & Condiments, Medicinal and Aromatic plants, Ornamental and Landscape architecture and Post-Harvest Technology etc. Importance of horticulture in national economy and in human nutrition. Scope of Horticulture
2. Horticultural & Botanical classification – Fruits, Vegetables, Ornamental plants, Spices and Plantation crops
3. Climate and soil for horticultural crops – Temperature, Rainfall,

Relative humidity, Wind, Soil organic matter, Soil pH, Soil air, soil Water etc.

UNIT-II: (6 Hrs.)

1. Plant propagation methods - sexual asexual and micro propagation. Plant Propagation structures – Polyhouses, Net houses, Plastic tunnels and Mist chambers
2. Principles of orchard establishment – selection of site – Steps in establishment of orchard
– clearing of the land – leveling – fencing – purpose of raising fence – live and non-live fences – good fence plant characters – examples of live and non-live fences – wind breaks – roads – drains – tillage – sowing green manure crops – marking plant positions – digging and filling of pits – selection of plants from the nursery – lifting and packing of plants – season of planting – planting and healing inn
3. Principles and Methods of training and pruning – training – definition – objectives of training fruit trees – reasons for training – methods of training – central leader, open center and modified leader systems with merits and demerits
4. Pruning – definition – reasons for pruning – objectives of pruning – responses of plants to pruning – activation of buds, dwarfing response, production of water shoots and delay in bearing – methods of pruning – thinning out, trimming, heading back, pollarding, pinching, disbudding and deblossoming – seasons of pruning – pruning and manuring – care of pruned woods – Juvenility and flower bud differentiation

UNIT-III: (6 Hrs.)

1. Unfruitfulness in fruit trees – causes – environmental causes, nutritional causes, inherent causes, biological causes and cultural causes and their remedies
2. Pollination, pollinizers, and pollinators
3. Fertilization and parthenocarpy

UNIT-IV: (6 Hrs.)

1. Kitchen gardening
2. Garden types and parts
3. Lawn making

UNIT-V: (6 Hrs.)

1. Medicinal & Aromatic plants
2. Spices and Condiments

3. Plant bio regulators - growth regulators and plant hormones – types of growth regulating substances – use of growth regulators in propagation – rooting of cuttings, induction of rooting in layering, union of rootstock and scion in grafting and budding, control of flowering, fruit set, fruit drop, parthenocarpy, fruit ripening, fruit size, quality and sex expression – preparation of growth regulators – powder, solution and lanolinpaste
4. Irrigation & fertilizers application – method and quantity

References Text Books:

1. Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth – Heinemann, Oxford University Press.
2. Prasad and Kumar. 2014, Principles of Horticulture 2ndEdn. Agro bios (India)
3. Kumar, N.1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Fundamentals of Plant Biochemistry and Soil Science

Course

Code: BICM101

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6Hrs.)

1. Introduction – Historical aspects of Biochemistry– Scope, impact, and importance of Biochemistry in agriculture.
2. Carbohydrates– Classification - Structures – Monosaccharides – Structural aspects.
3. Oligosaccharides and polysaccharides-Functions of carbohydrates
4. Lipids – Fatty acids – Structures and properties – Functions of lipids.
5. Lipids - Classification – Storage lipids and membrane lipids – Saponification, hydrogenation.
- 6 Amino acids – Structures - Classification – Zwitterions.

UNIT-II: (6Hrs.)

1. Peptides – Oligopeptides – Cyclic and acyclic peptides.
2. Proteins –Importance - Classification - Properties of proteins –Isoelectric pH– Denaturation.
3. Proteins – Structural organization – Primary, secondary, tertiary, and quaternary structures and forces involved in stabilizing proteins.

4. Enzymes – Characteristics of enzymes – Chemical nature, speed, specificity, active site - activation energy – Mechanism of enzyme action.
5. Measurement of enzyme activity – Factors effecting enzyme activity – Enzyme Inhibition.
6. Classification of enzymes.

UNIT-III: (6Hrs.)

1. Nucleic acids–Functions–Structures of nitrogen bases–Nucleosides–Nucleotides in RNA and DNA.
2. Various types of DNA and RNA – Secondary structure of B-DNA and t-RNA.
3. Metabolism–Anabolism and Catabolism–Stages of respiration–Overall metabolic view of carbohydrates, proteins, and lipids.
4. Metabolism of carbohydrates – Glycolysis – Aerobic and anaerobic.
5. Tricarboxylic Acid (TCA) cycle AND Electron transport chain (ETC.)
6. Metabolism of lipids –Biosynthesis of fatty acids and oxidation of fatty acids.

UNIT-IV: (6Hrs.)

1. Introduction – evolution of the earth – spheres of the earth atmosphere, hydrosphere and lithosphere – their characteristics – origin of soil – soil and soil components – mineral matter, organic matter, water and air – definition of soil and various concepts of soil – branches of soil science.
3. Rocks – classification of rocks based on mode of origin – igneous rocks, sedimentary rocks and metamorphic rocks – classification of rocks based on silica content – weatherability of rocks.
4. Minerals – primary, secondary, essential, and accessory minerals – primary minerals – quartz, feldspar, micas, pyroxenes, amphiboles, and olivine's – weatherability of primary minerals.
5. Soil profile – detailed description of a theoretical soil profile – differences between surface soil and sub soil.

UNIT-V: (6Hrs.)

1. Nitrogen fixation, denitrification, solubilization of phosphorus and biological control of plant diseases – promotion of plant growth promoting substances – harmful activities of soil organisms.
2. Soil organic matter – various sources – composition – compounds in plant residues – their decomposability – humus – definition – synthesis of humus.
3. Importance of soil organic matter and humus – fractionation of soil humus – carbon cycle – carbon.

4. Important soil groups of India – alluvial soils, black soils, red soils, laterite soils and coastal sands.

Reference Text Books:

1. Principles of Biochemistry- *Lehninger*
2. David L. Nelson, Michael M.Cox; W.H. Freeman.Lehninger Principles of Biochemistry, 6th Edition
3. Biochemistry, Dr.U.Satyanarayana, Dr.U. Chakrapani, Books and Allied(P) Ltd, Kolkata

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Fundamentals of Agronomy-Practical

Course Code: AGRO101P

No. of Hours: 30 Hrs.

Credits: 1

EXPERIMENTS:

1. Study of tillage Implements: Fields. (3 Hrs.)
2. Practice of puddling: Fields. (3 Hrs.)

3. Study of seeding equipment – different methods of sowing: Fields.
(3 Hrs.)
4. Study of manures, fertilizers and green manure crops / seeds.
(4 Hrs.)
5. Study of inter-cultivation implements and practice. (4 Hrs.)
6. Herbarium preparation of weeds. (3 Hrs.)
7. **Field tours: Water reservoir:** (10 Hrs.)
1. Krishna
 2. Pattiseema Project (Polavaram)
 3. Godavari

Patron of Evaluation:

S.No.	Experiment	Marks (50)
01	Major Experiment	15Marks
02	Minor Experiment	10Marks
03	Viva	10Marks
04	Record	10Marks
05	Skills	05Marks

Subject: Agriculture and Rural Development
Course Title: Fundamentals of Horticulture-Practical
Course Code: HORT181P
No. of Hours: 30 Hrs.

Semester: I

Credits: 1

EXPERIMENTS:

1. Identification of garden tools. **(6 Hrs.)**
2. Identification of horticultural crops. **(6 Hrs.)**
3. Preparation of seed bed / nursery bed. **(6 Hrs.)**
4. Grafting & Budding. **(6 Hrs.)**
5. Transplanting and care of vegetable seedlings. **(6 Hrs.)**

Patron of Evaluation:

S.No.	Experiment	Marks (50)
01	Major Experiment	15Marks
02	Minor Experiment	10Marks
03	Viva	10Marks
04	Record	10Marks
05	Skills	05Marks

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development

Semester: I

Course Title: Fundamentals of Plant Biochemistry and Soil Science-Practical

Course Code: BICM101P

No. of Hours: 30 Hrs.

Credits: 1

EXPERIMENTS:

Experiment No.1-Determination of pH and use of pH meter. **(5Hrs.)**

Experiment No.2-Preparation of molar, Normal solutions and Buffers.

(5Hrs.)

Experiment No.3-Estimation of carbohydrates (glucose) by DNS method.

(5Hrs.)

Experiment No.4-Estimation of Proteins by Biuret method. **(5Hrs.)**

Experiment No.5-Study types of soil. **(5Hrs.)**

Experiment No.6-Study of sampling collection, processing and storage.

(5Hrs.)

Patron of Evaluation:

S.No.	Experiment	Marks (50)
01	Major Experiment	15Marks
02	Minor Experiment	10Marks
03	Viva	10Marks
04	Record	10Marks
05	Skills	05Marks

SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Soil and Water Conservation Engineering

Course Code: AENG151

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6Hrs.)

1. Introduction to soil and water conservation and causes of soil erosion.

2. Definition and agents of soil erosion, water erosion - Forms of water erosion - Gully classification and control measures.

3. Soil loss estimation by universal soil loss equation - Soil loss measurement techniques.

UNIT-II: (6Hrs.)

1. Principles of erosion control - Introduction to contouring, strip cropping.

2. Contour bund - Graded bund and bench terracing.

3. Wind erosion - Mechanics of wind erosion, types of soil movement - Principles of wind erosion control and its control measures.

4. Grassed water ways and their design.

UNIT-III: (6Hrs.)

1. Introduction to irrigation - Classification of irrigation projects.

2. Importance of irrigation water measurements - Volumetric, area velocity, discharge methods - Weirs, orifice, flumes.

3. Open channel hydraulics - Discharge calculations.

UNIT-IV: (6Hrs.)

1. Types of wells - Water lifting devices - Classification of pumps, their capacity, power requirement and discharge calculations.

2. Functional components and working principle of underground pipeline systems.

UNIT-V: (6Hrs.)

1. Functional components of micro irrigation systems and its design like drip, sprinkler irrigation systems etc.

2. Water harvesting techniques - Lining of ponds, tanks and canal systems.

References Text Books

1. Ghanshyam Das., 2012. Hydrology and Soil Conservation Engineering, including Watershed Management. Second edition, PHI Learning Private Limited, New Delhi - 110001

2. Murthy, V. V.N., 2004. Land and Water Management Engineering. Kalayani Publishers, New Delhi

3. Michael A.M., 2007. Irrigation Theory and Practice. Second edition. Vikas Publishing House Pvt. Ltd.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Introductory Agro Meteorology and Climate Change

Course Code: AGRO103

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6Hrs.)

1. Earth atmosphere, composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height
2. Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze.

UNIT-II: (6Hrs.)

1. Atmospheric humidity, concept of saturation, vapour pressure, process of condensation, formation of dew, fog, mist, frost, cloud.
2. Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification.

UNIT-III: (6Hrs.)

1. Artificial rainmaking; Monsoon, mechanism and importance in Indian agriculture. Weather hazards, drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold wave;
2. Agriculture and weather relations, modifications of crop microclimate, climatic normal for crop and livestock production.

UNIT-IV: (6Hrs.)

1. Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, energy balance of earth;
2. Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, long wave and thermal radiation, net radiation, albedo

UNIT-V: (6Hrs.)

1. Weather forecasting, types of weather forecast and their uses.
2. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

References Text Books:

1. Radha Krishna Murthy, V. 2016. Principles and practices of agricultural disaster management. B.S Publications, Koti, Hyderabad.
2. Reddy, S.R. 2014. Introduction to Agriculture and Agrometeorology. Kalyani Publishers, Ludhiana, Punjab.

SYLLABUS

Subject: Agriculture and Rural Development

Course Title: Terrace Gardening

No. of Hours: 30 Hrs.

Semester: II

Course Code: CERTG

Credits: I

PRACTICAL

UNIT-I: (6 Hours)

1. Introduction to seed bed - History, definition
2. Brief description methods of preparation of field

UNIT-II: (6 Hours)

1. Procedure for preparation of seed bed by step by step
2. Materials used for seed bed of greenhouses

UNIT-III: (6 Hours)

1. Different types of seed bed

UNIT-IV: (6 Hours)

1. Seed bed treatment

UNIT-V: (6 Hours)

1. Advantages and Disadvantages in seed bed

Reference Text Books:

1. Holzworth, L.K., Wiesner, L.E., and Bowman, H.F. Grass and Legume Seed Production in Montana and Wyoming. Special Report No. 12. Revised 1990. 31p.
2. Montana State University, Extension Service. Montana Interagency Plant Materials Handbook for Forage Production, Conservation, Reclamation, and Wildlife. EB 69. June 1990. Pgs. 175-185.
3. Ogle, D., St. John, L, Cornwell, J., Stannard, M., and Holzworth, L. 2008. Technical Note 10. Pasture and Range Seedings: Planning-Installation-Evaluation. USDA-Natural Resources

SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Fundamentals of Entomology- I

Course Code: ENTO131

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6 Hrs.)

1. History of Entomology in India. Factors for insect's abundance. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes.
2. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and moulting.

UNIT-II: (6 Hrs.)

1. Body segmentation. Structure of Head, thorax and abdomen.
2. Structure and modifications of insect antennae, mouth parts, legs, wing venation, modifications and wing coupling apparatus.
3. Structure of male and female genital organs. Metamorphosis and diapause in insects.

UNIT-III: (6 Hrs.)

1. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive systems in insects.
2. Types of reproduction in insects. Major sensory organs like simple and compound eyes and chemoreceptors.

UNIT-IV: (6 Hrs.)

1. Systematics: Taxonomy–importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order.
2. Classification of class Insecta upto orders. basic groups of present day insects with special emphasis to orders and families of agricultural importance like Arthropoda: Acrididae, Tettigonidae, Gryllidae, Gryllotalpidae;

UNIT-V: (6 Hrs.)

1. Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Miridae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera:
 2. Pieridae, Papilionidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Lymantridae, Saturniidae, Bombycidae;
 3. Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Apionidae, Bruchidae, Scarabaeidae;

References Text Books:

1. Chapman, R. F 2013 Insects: Structure and Function. Ed by Simpson, S. J. and Douglas, A. C. Cambridge Univ. Press, UK.
2. Richards, O.W. and Davies, R.G 1977. Imm's General Text Book of Entomology (Vol. I and II). Chapman and Hall, London.

3. Wigglesworth, V.B 2013. Insect Physiology. Springer (Originally published by Chapman and Hall, London, 1974).
4. Pant, N.C. and Ghai, S. 198. Insect Physiology and Anatomy. ICAR, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development	Semester: II
Course Title: Fundamentals of Genetics	Course Code: GPBR 111
No. of Hours: 30 Hrs.	Credits: 2

UNIT-I: (6 Hrs.)

1. Pre Mendelian concepts of heredity – Early history of heredity, inheritance of acquired traits, preformation theory, pangenesis and germplasm theory.
2. Chromosome - Structure of chromosome, types of chromosomes based on position of centromere.
3. Cell division – Cell cycle – Mitosis - Process of mitosis - Significance.
4. Meiosis - Process - Differences between mitosis and meiosis - Significance.
5. Mendelian principles of heredity – Terminology, Mendel’s experiments- Reasons for selection of pea as experimental material- characters studied - Reasons for mendel’s success.

6. Mendel's laws – Law of segregation – Law of independent assortment – Principle of dominance – Principle of unit characters – Exceptions to Mendel's laws – Rediscovery of Mendelian principles.

UNIT-II: (6 Hrs.)

1. Gene interaction - Non-epistatic interaction – Interaction of factors; epistatic interactions – Complementary epistasis, dominant epistasis.

2. Recessive epistasis, duplicate dominant gene action, dominant suppression or inhibitory gene action, duplicate genes with cumulative effect.

2. Multiple alleles – Characteristics of multiple alleles - Blood groups in humans, coat colour in rabbits, self-incompatibility alleles in plants - pleiotropism, penetrance and expressivity.

4. Linkage – Definition – Classification of linkage – Characteristic features of linkage – Linkage groups.

5. Detection of linkage – Estimation of linkage - Importance of test cross in linkage studies - significance in plant breeding.

UNIT-III: (6 Hrs.)

1. Chromosome mapping – point and

2. point test cross – Cytological maps and genetical maps –

3. Coincidence and interference.

4. Sex determination – Various mechanisms of sex determination – Chromosomal sex determination, genic balance mechanism of sex determination in *Drosophila melanogaster*, male haploidy, single gene effects etc.

5. Sex linkage – White eye colour in *Drosophila*, colour blindness and haemophilia in humans - sex-influenced traits – Horns in sheep, baldness in humans, sex-limited - Milk production in cattle, beard in man – Pseudohermaphrodites – Gynandromorphs.

6. Qualitative and Quantitative traits, Polygenes and continuous variations - Definition - Inheritance and their differences, multiple factor hypothesis.

UNIT-IV: (6 Hrs.)

1. Nature and structure of genetic material - DNA and its structure - Watson and Crick's model - Function – Experiments to prove DNA as genetic material.

2. Replication of DNA - Modes of DNA replication - Semi-conservative DNA replication - Experimental proof.

3. Types of RNA - Messenger RNA, ribosomal RNA and transfer RNA - structure of tRNA, differences between DNA and RNA.

4. Transcription and translational mechanism of genetic material - Genetic code – Properties of genetic code – Wobble hypothesis.

UNIT-V: (6 Hrs.)

1. Mutation - Classification - Gene mutations - Introduction - Definition - Types of mutations - Spontaneous and induced mutations - Point mutations - Characters of mutations - Xenia and metaxenia – Chimeras Types and their significance in plant breeding.

2. Methods of inducing mutations, Physical and chemical mutagens - Detection of sex linked lethals in Drosophila (CIB method given by Muller).

3. Molecular basis of mutations - Transitions, transversions and frame shift mutations - Importance of mutations in plant breeding.

References Text Books:

1. Punthian Singh. 2006. Genetics. Kalyani Publishers, Ludhiana.
2. Singh, B.D. 2015. Fundamentals of Genetics. Kalyani Publishers, Ludhiana.
3. Gupta, P.K. 2007. Genetics. Rastogi Publications, Meerut.
4. Khanna, V.K. 2002. Genetics Numerical Problems. Kalyani publishers. 2nd edition.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Fundamentals of Plant Pathology-I

Course Code: PATH171

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I: (6 Hrs.)

1. Importance of plant diseases, scope and objectives of Plant Pathology.
2. Important plant pathogenic organisms,
3. Different groups: fungi, bacteria, fastidious vesicular bacteria, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasites and nematodes with examples of diseases caused by them.

UNIT-II: (6 Hrs.)

1. Diseases and symptoms due to abiotic causes. Fungi: General characters, definition of fungus, somatic structures,
2. Types of fungal thalli, fungal tissues, Modifications of Thallus, reproduction (asexual and sexual).

UNIT-III: (6 Hrs.)

1. Nomenclature, Binomial system of nomenclature, rules of nomenclature.
2. Classification of fungi. Key to divisions, sub-divisions, orders and classes. Bacteria and mollicutes: general morphological characters.

UNIT-IV: (6 Hr.)

1. Basic methods of classification and reproduction. Viruses: nature, architecture, multiplication and transmission. Study of phanerogamic plant parasites.

UNIT-V: (6 Hrs.)

1. Nematodes: General morphology and reproduction
2. Classification, symptoms and nature of damage caused by plant nematodes (Heterodera, Meloidogyne, Anguina etc.)

References Text Books:

1. Alexopoulos, C.J., Mims C.W. and Blackwell M. 1996. Introductory Mycology.
2. Wiley Eastern Ltd., New York. Mandahar, C.L. 1987.
3. Introduction to Plant Viruses. S. Chand and Co., New Delhi.
4. Mehrotra, R.S. and Aneja, K.R. 1990. An Introduction to Mycology.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Zero Budget Natural Farming

Course Code: 20SDCZN2

No. of Hours: 30 Hrs.

Credits: 2

PRACTICAL

UNIT-I: (6 Hours)

1. Introduction to ZBNF - History, definition
2. Brief description methods of preparation of ZBNF

UNIT-II: (6 Hours)

1. Procedure for preparation of Natural Fertilizers by step by step
2. Materials used for Natural Fertilizers

UNIT-III: (6 Hours)

1. Key elements and strategy of ZBNF

UNIT-IV: (6 Hours)

1. Nutrient values for used in ZBNF

UNIT-V: (6 Hours)

1. Advantages and Disadvantages in ZBNF

Reference Text Books:

1. 1975 (in English) 1978 re-presentation The One-Straw Revolution: An Introduction to Natural Farming.
2. ^ "Life and Death in the Field | Final Straw – Food | Earth | Happiness". www.finalstraw.org. Retrieved 2017-04-16.
3. ^ Floyd, J.; Zubevich, K. (2010). "Linking foresight and sustainability: An integral approach". *Futures*. **42**: 59–68. doi:10.1016/j.futures.2009.08.001.
4. ^ Hanley, Paul (1990). "Agriculture: A Fundamental Principle" (PDF). *Journal of Bahá'í Studies*. **3** (1). Archived from the original (PDF) on March 27, 2013. Retrieved April 28, 2014.
5. ^ Colin Adrien MacKinley Duncan (1996). *The Centrality of Agriculture: Between Humankind and the Rest of Nature*. McGill-Queen's Press - MQUP. ISBN 978-0-7735-6571-5.
6. ^ Trees on Organic Farms, Mirret, Erin Paige. North Carolina State University, 2001
7. ^ Stephen Morse; Michael Stockin (1995). *People and Environment: Development for the Future*. Taylor & Francis Group. ISBN 978-1-85728-283-2.
8. Elpel, Thomas J. (November 1, 2002). *Participating in Nature: Thomas J. Elpel's Field Guide to Primitive Living Skills*. ISBN 1892784122.
9. What Does Natural Farming Mean? Archived 2011-07-20 at the Wayback Machine by Toyoda, Natsuko

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Soil and Water Conservation Engineering-Practical

Course Code: AENG151P

No. of Hours: 30 Hrs.

Credits: 1

EXPERIMENTS:

1. Practicing survey - Principles and educating to use pacing technique for measurement. **(4 hrs.)**
2. Area calculations through chain survey - GPS demo for tracking and area measurement. **(4 hrs.)**
3. Estimation of soil loss and calculation of erosion index. **(3 hrs.)**
4. Levelling concepts and practical utility in agriculture. **(4 hrs.)**
5. Water discharge measurements lab exercises for computing discharge. 12&13. Different irrigation pumps and their constructional differences. **(4 hrs.)**
6. Farm Pond construction and its design aspects. **(3 hrs.)**
7. Farm Pond and canal lining and its procedures. **(4 hrs.)**
8. Visit to nearby farm pond. **(4 hrs.)**

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development

Semester: II

Course Title: Introductory Agrometeorology and Climate Change-Practical

Course Code: AGRO103P

No. of Hours: 30 Hrs.

Credits: 1

EXPERIMENTS:

1. Visit to Agrometeorological Observatory, site selection and layout plan for observatory. **(3 Hrs.)**
2. Exposure to agrometeorological instruments and weather data recording. **(4 Hrs.)**
3. Measurement of albedo and sunshine duration. **(3 Hrs.)**
4. Computation of radiation Intensity using bright sun shine hours. **(3 Hrs.)**
5. Tabulation of maximum and minimum air temperatures, trend and variation analysis for climate change of the region. **(3 Hrs.)**
6. Measurement of soil temperature and computation of soil heat flux.

- (4 Hrs.)
7. Determination of atmospheric pressure and vapour pressure. (3 Hrs.)
 8. Determination of relative humidity. (3 Hrs.)
 9. Determination of dew point temperature- Measurement of atmospheric pressure and analysis of atmospheric conditions. (4 Hrs.)

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development Semester: **II**
Course Title: Fundamentals of Genetics-Practical
Course Code: GPBR 111P
No. of Hours: 30 Hrs. Credits: **1**

EXPERIMENTS:

1. Study of microscope. (3Hrs.)
2. Study of cell structure. (3Hrs.)
3. Practice on meiotic cell division. (4Hrs.)
4. Monohybrid and its modifications, Dihybrid and Trihybrid. (4Hrs.)
5. Test cross and back cross. (4Hrs.)
6. Epistatic interactions including test cross and back cross. (4Hrs.)
7. Study of models on DNA and RNA structure. (4Hrs.)
8. Epistatic interactions including test cross and back cross. (4Hrs.)

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development Semester: **II**
Course Title: Fundamentals of Plant Pathology-I Practical
Course Code: PATH171P
No. of Hours: 30 Hrs. Credits: **1**

EXPERIMENTS:

1. Study of vegetative structures of fungi and their modifications. (3 Hrs.)
2. Study of reproductive (sexual and asexual) structures of fungi. (4 Hrs.)
3. Study of Pythium and Phytophthora. (4 Hrs.)
4. Study of Albugo. (3 Hrs.)
5. Study of imperfect fungi – Aspergillus, Penicillium and Pyricularia. (4 Hrs.)

6. Study of imperfect fungi – Fusarium, Rhizoctonia and Sclerotium.

(4 Hrs.)

7. Isolation of phytopathogenic bacteria (locally available diseased plant material) and study of colony characteristics and Gram's staining.

(4 Hrs.)

8. Demonstration of mechanical transmission of plant viruses. (4 Hrs.)

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Agricultural Finance and Co-Operation

Course Code: AECO241

No. of Hrs: 15

Credits: 1

THEORY

UNIT I (3Hrs)

1. Agricultural Finance - Meaning, definition, nature and scope - Significance - Micro and macro finance - Capital and credit problems, need and their importance in Agriculture.

2. Credit - Meaning and definition - Classification of credit based on different criteria with examples.

3. Credit analysis - Economic feasibility tests - 3 R's of credit analysis - Returns to investment - Repayment capacity - Meaning, causes of poor repayment capacity of farmers, suggestions to improve repayment capacity - Risk bearing ability - Meaning, sources of risk, means to strengthen RBA.

4. Five Cs of credit – Character – Capacity – Capital - Condition and Common sense - Seven Ps of credit - Principle of Productive purpose - Principle of personality - Principle of productivity - Principle of phased disbursement - Principle of proper utilization - Principle of payment and Principle of protection.

UNIT II (4Hrs)

1. Social control and nationalisation - Meaning, objectives and their importance - Privatisation of commercial banks - Need and importance for institutional sources and structure of agricultural lending from different sources.

2. Lead bank scheme - Origin, objectives, functions - District credit plan - Regional Rural Banks (RRBs) - Origin, objectives, functions — RRBs in Andhra Pradesh.

3. Crop loan system - Objectives, importance, features of crop loan system - Scale of finance - Meaning and estimation and role of district level consultative committee - Term loans – Objectives and meaning of unit costs, fixation of unit costs and NABARD guidelines.

UNIT III (3Hrs)

1. Financial inclusion - Meaning and importance - Micro finance - Meaning, importance, agencies providing microcredit banks, NBFCs, NGOs, and Govt.

agencies - SHGs and their role in microfinance and bank linkages - Micro finance lending and control act in Andhra Pradesh - Objectives and important features.

2. Schemes for financing weaker sections - Differential interest rate (DIR) - Integrated rural development programme (IRDP) - Swarnajayanti gram swarozgar yojana (SGSY) - Self-help groups (SHGs) etc., Srinidhi, MUDRA.
3. Higher financing agencies - Reserve Bank of India (RBI) - Objectives and functions and role in agricultural development and finance. National Bank for Agricultural and Rural Development (NABARD) - Origin, functions, activities and role in agricultural development.

UNIT IV (3Hrs)

1. World Bank (WB) - Objectives and functions -World Bank group institutions - role and functions of International Bank for Reconstruction and Development (IBRD) - International Development Agency (IDA) - International Finance Corporation (IFC), MIGA, ISID.
2. Crop insurance - Meaning and its advantages and limitations in application - Agricultural insurance company of India - Objectives and functions - Indemnity - Meaning, premiums and claims - Prime Minister's Fasal Bhima Yojana (PMFBY) - Salient features - Weather based crop insurance - Salient features and its importance.
3. Agricultural project - Meaning, characteristics of agril. projects, project cycle and explanation of different phases of project cycle - Basic guidelines for preparation of project reports.

UNIT V (2Hrs)

1. Co-operation - Meaning, Scope, importance and definition - Principles - Objectives of co-operation, significance of cooperatives in Indian agriculture.
2. Brief history of cooperative movement development in India - Recent developments in Indian cooperative movement - Short comings of Indian co-operative movement and remedies.
3. Agricultural Cooperative institutions in India - co-operative credit structure in India and Andhra Pradesh – Objectives and functions of state level (APCOB), district level (DCCB) and Village level (PACS) cooperative societies - Functions of marketing, consumer societies, multi-purpose cooperatives, farmers' service cooperative societies, dairy cooperatives - Andhra Pradesh mutually aided Co-operative Societies Act (1995) - Role of International Cooperative Alliance (ICA), National cooperative Union of India (NCUI), National Cooperative Development Council (NCDC).

References Text Books

1. Johil S.S. and C.V. Moore. 1970. Essentials of Farm Financial Management. Today and Tomorrow Printers and Publishers, New Delhi.
2. John, J. Hampton. 1983. Financial Decision Making: Concepts, Problems and Cases, of India. New Delhi.

3. Mamoria, C.B. and R.D. Saksena. 1973. Co-operatives in India. Kitab Mahal, Allahabad,
4. Mamoria, C.B. and Saxena. Agricultural Problems in India. Kitab Mahal, Allahabad
5. Mukhi, H R. 1983. Cooperation in India and Abroad. New Heights Publishers, New Delhi.

References Books

1. Muniraj, R. 1987. Farm Finance for Development, Oxford & IBH Publishing Company Ltd., New Delhi,
2. Subba Reddy, S. and P. Raghuram. Agricultural Finance and Management. Oxford & Publishing Company Private Ltd., New Delhi, 2005
3. Subba Reddy, S., Raghu Ram., P., Sastry, T.V.N and Bhavani Devi, I. 2016. Agricultural Economics. Oxford & IBH Publishing Company Private Ltd., New Delhi.
4. Pandey, U.K. Agricultural Finance in India.
5. William, G. Murray and Nelson Aarson, G. Agricultural Finance. The Iowa State University Press, Ames, Iowa state University press Ames, IOWA.
6. www.rbi.org 12. www.nabard.org
7. www.wb.org

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Farm Machinery and Power

Course Code: AENG251

No. of Hrs:15

Credits: 1

THEORY

UNIT I (3Hrs)

1. Farm power – Source of different farm power, advantages and disadvantages.
2. Internal combustion engine - Different components and their functions - Working principle of four stroke and two stroke cycle engine - Comparison between diesel and petrol engine - Difference between four and two stroke engines.
3. Terminology related to engine power - IHP, BHP, FHP, DBHP, compression ratio, stroke bore ratio, piston displacement, and mechanical efficiency - Numerical problems on calculation of IHP, BHP, C.R., stroke bore ratio, piston displacement volume.
4. Fuel supply and cooling system of I.C. engine – Types, components and their functions, working principle of forced circulation cooling system.

UNIT II (2Hrs)

1. Ignition and power transmission system of I.C engine – Types, components and their functions, working principle of battery ignition system.
2. Lubrication system of I.C. engine – Types, purpose, components and their functions, working principle of forced feed system - Tractors classification, types, points to be considered in selection of tractors, estimating the cost of operation of tractor power.
3. Tillage - Primary and secondary tillage - M.B. plough – Functions, constructional features, operational adjustments and maintenance.

UNIT III (5Hrs)

1. Disc plough – Functions, constructional details, operational adjustments and maintenance.
2. Numerical problems on M.B. plough and disc plough.
3. Harrows – Types, functions, operation of disc harrows - Cultivators – Rigid and spring loaded tynes - Puddlers, cage wheel, rotovators - Intercultural implements – Hoes and weeders for dry and wetland cultivation.

UNIT IV (2Hrs)

4. Sowing equipment - Seed cum fertilizer drills – Types, functions, types of metering mechanisms, functional components, calibration - Paddy transplanters.
5. Harvesting equipment – Sickles, self-propelled reaper, alignment and registration - Combines, functions of combines.
6. Plant protection equipment – Types of sprayers, constructional features of knapsack sprayer, hand compression sprayer, foot sprayer, rocker sprayer and power sprayer, care and maintenance of sprayers.

UNIT V (3Hrs)

1. Dusters – Hand rotary and power operated dusters, care and maintenance of dusters.
2. Tractor mounted equipments for land development and soil conservation – Functions of bund former, ridger, and leveling blade.
3. Threshing equipment and principles of combine harvester

References Text Books

1. Jagadishwar Sahay - Elements of Agricultural Engineering.
2. Surendra Singh. Farm Machinery - Principles and Applications. ICAR Publication.
3. S.C. Jain and C.R. Rai. Farm Tractor – Maintenance and Repair. Standard Publishers, 1705-B, Nai Sarak, Delhi – 110006
4. Ojha, T. P. and Michael, A.M. Principles of Agricultural Engineering. Vol. I, Jain Brothers, 16/893, East Park Road, Karol Bagh, New Delhi – 110005

SYLLABUS

Subject: Agriculture and Rural Developments Semester: III

Course Title: Economics for Rural Development

Course Code: AERD 201

No. of Hrs:30

Credits: 2

THEORY

Unit I (6Hrs)

Introduction to Rural Economics, Nature and Scope of Rural Economics, Inter-disciplinary approach of Rural Economics –Components-Structure and Characteristics -Pre and Post-independence.

Unit II : (6Hrs)

Rural Resources Management in India, Rural Resources –Nature-Types and Magnitude - Rural Resources, Management and Development, Application of Technology in Rural Development – Problems and prospects.

Unit III : (6Hrs)

Rural Demography - Population Size - Sex and Age Composition- Density of Population, Population Problems and Challenges – Family Welfare Measures in Rural India.

Unit IV : (6Hrs)

Rural Occupational Structure - Nature of Rural Occupations - Occupational Distribution in Rural India – The Concept of Work Participation Rates.

Unit V : (6Hrs)

Rural Poverty and Unemployment - Rural Poverty-Meaning, Estimates, Causes and Consequences. Unemployment - Meaning, Types, Magnitude of Rural Unemployment, - Causes and Consequences.

References Text Books

1. Vasant Desai: Rural Development in India, Himalaya Publishing House, Mumbai, 2012.
2. Dutt and Sundaram- Indian Economy, S.Chand Publications, New Delhi, 2013-07-02.

3. Mishra,S.K. and PuriV.K. - Economics of Development and Planning, Himalaya Publishing House, Mumbai, 2012.
4. Mukundan,N.-Rural Development and Poverty eradication in India.
5. Katar Singh -Rural Development –Principles, Policies and Management.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Fundamentals Of Agricultural Extension

Course Code: AEXT291

No. of Hrs:30

Credits: 2

THEORY

UNIT I (6Hrs)

1. Education - Meaning, definition and Types – Formal, non-formal and informal education.

Extension Education – Meaning, definition, concepts - Characteristics, scope and process.

2. Objectives and principles of extension education.

3. Extension programme planning – Meaning, process, principles.

4. Extension programme planning – Steps in programme development.

5. Extension systems in India.

6. Extension efforts in pre-independence era – Sriniketan, Marthandam, Sevagram, Firka Development Scheme, Gurgaon Experiment, etc.

UNIT II (6hrs)

1. Extension efforts in post-independence era - Etawah pilot project, Nilokheri experiment etc.

2. Extension/Agriculture development programme launched by ICAR/Govt. of India – IADP, IAAP and HYVP.
3. Extension / Agriculture development programme launched by ICAR / Govt. of India – SFDA, MFAL and T & V System.
4. a) Extension / Agriculture development programme launched by ICAR / Govt. of India, KVK, ORP and ND.
b) IVLP.
5. a) Extension / Agriculture development programmes launched by ICAR / Govt. of India – NATP, ATMA, SREP, ATIC. b) NAIP.
6. New trends in agriculture extension – Privatization extension and cyber extension / e-extension.

UNIT III (6hrs)

1. New trends in agriculture extension – Market led extension, farmer-led extension, expert systems, etc.
2. Community development – Meaning, definition, concept and principles - Philology of C.D.
3. Rural development - Meaning, definitions, concept, characteristics, objectives, importance and problems in rural development.
4. Rural development launched by Govt. of India – National Extension Service (NES), Panchayat Raj Systems/ Democratic Decentralization and Panchayat Raj – Need.
5. Rural development launched by Govt. of India – Three tiers of Panchayat Raj system – Powers, functions and organization set up -Mandal system in Andhra Pradesh.
6. Social justice and poverty alleviation programmes – ITDA, IWDP and NERP.

UNIT IV (6hrs)

1. Social justice and poverty alleviation programmes – IRDP, JRY, SGRY, SGSY and MGNREGP.
2. Women development programmes – ICDS, DWCRA, RMK, MSY, ANTWA and IKP.
3. Participatory Rural Appraisal (PRA)
4. Rural leadership - Meaning, definition and concept, types of leaders in rural context, roles of leaders and different methods in selection of a leader.
5. Training of leaders – Lay and professional leaders, advantages and limitations in using local leaders in Agricultural Extension.
6. Extension administration - Meaning, definition and concept, principles and functions - Monitoring and evaluation – Meaning, definition and concept, objectives - Types and importance and monitoring and evaluation of extension programmes.
7. Transfer of technology - Concept and models and capacity building of extension personnel farmers – Training – Meaning, definition, types of training

– Pre-Service training - In-service, orientation, induction training, refresher training and training for professional qualification.

UNIT V (6hrs)

1. Training of farmers, farm women and rural youth – Farmers’ Training Centre (FTC) - Objectives – Training organized - District Agricultural Advisory and Transfer of Technology Centre (DAATTC) – Objectives.
2. Extension teaching methods - Meaning, classification, individual, group and mass contact methods, media mix strategies and communication - Meaning and definition
3. Functions of communication, models – Aristotle, Shannon, Weaver, Berlo, Schramm, J.P. Leagans, Rogers and Shoemaker, Litterer, Westley – Macleans and barriers to communication.
4. Agriculture journalism – Meaning – Scope – Importance - Characteristics of News – Factors determining the News value – Types of News and sources of News.
5. Diffusion and adoption of innovation - Meaning, definition, concepts and process and stages and Models of adoption process – Five (5) and Seven (7) stage models - Attributes of innovation – Relative advantage, compatibility, complexity, trialability – observability and predictability.
6. Innovation – Decision process – Meaning – Stages (Knowledge, persuasion, decision, implementation and confirmation) - Decision process – Meaning – Stages (Knowledge, persuasion, decision, implementation and confirmation) - Concepts - Dissonance – Rejection – Active rejection and passive rejection - Discontinuance – Replacement and disenchantment discontinuance – Over adoption – Rate of adoption and innovativeness.
7. Adopter categories and their characteristics - Factors influencing adoption process – Social, personal and situational.

References Text Books

1. Adivi Reddy, A. 2006. Extension Education. Sree Lakshmi Press, Bapatla.
2. Dahama, O.P. and Bhatnagar, O.P. 1999. Extension and Communication for Development. Oxford & IBH Private Limited, New Delhi/Mumbai.
3. Ganesh, R., Mohammad Iqbal and Ananda Raja. 2003. Reaching the Unreached – Basics of Extension Education. Associate Publishing Company, New Delhi.
4. Jalihal, K.A. and Veerabhadraiah, V. 2007. Fundamentals of Extension Education and Management in Extension. Concept Publishing House, New Delhi.

5. Ray, G.L. 2006. Extension Communication and Management. Naya Prokash/Kalyani Publishers, Kalkatta/Ludhiana.
6. Rayudu, C.S. 1997. Communication. Himalaya Publishing House, New Delhi.
7. Rogers, E.M. 2003. Diffusion of Innovation. Free Press, New Delhi.
8. Soma Sundaram, T. 1977. Producing Agricultural Information Materials. Kansas State University, USA and APAU, Hyderabad.

SYLLABUS

Subject: Agriculture and Rural Development **Semester: III**

Course Title: Crop Production Technology – I (Cereals, Millets and Pulses)

Course Code: AGRO 201

No. of Hrs:30

Credits: 2

Theory

UNIT I (6Hrs)

1. Cereals – Importance and special features of cereals - Rice- Origin - geographical distribution – nutritional value – area, production and productivity in India and Andhra Pradesh
2. Economic importance - soil and climatic requirements
3. Classification of rice plant types - growth Stages of rice -different types of rice ecosystems
4. Land Preparation –physico – chemical and biological changes under submerged soils
5. Crop establishment techniques in rice - Climate resilient technologies
6. Nutrient management with special emphasis on nitrogen dynamics, micro nutrients -INM

UNIT II (6hrs)

1. Water management in rice under different rice ecosystems
2. Weed management including weed management in rice nurseries – IWM
3. Harvesting -Yield attributes - yield - post harvest operations - milling of rice

4. Value added products of rice – export potential - rice grain classification, cropping systems in rice 11. Wheat- Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance - soil and climatic requirements - zones of wheat cultivation - growth Stages - Classification
5. Land Preparation - seeds and sowing - nutrient management - water management - weed management - climate resilient technologies
6. Harvesting -yield attributes – yield - post harvest operations – wheat based cropping systems – value addition

UNIT III (6hrs)

1. Barley – Origin- geographical distribution - economic importance- classification - area, production and productivity in India and Andhra Pradesh - soil and climatic requirements --varieties - cultural practices - Harvesting -Yield attributes – yield
2. Maize- Origin- geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh- soil and climatic requirements - growth stages - Classification of maize
3. Land Preparation – zero tillage - seeds and sowing - nutrient management - water management - weed management - climate resilient technologies²¹
4. Harvesting - yield attributes – yield - post harvest operations - value addition - cropping systems 18. Millets- Economic importance - constraints and strategies for increasing the production of millets - climate resilient technologies
5. Jowar- Origin - geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh - soil and climatic requirements - zones of jowar cultivation - growth Stages - Land Preparation - seeds and sowing

UNIT IV (6hrs)

1. Nutrient management - water management - weed management – harvesting- yield attributes – yield - post harvest operations - value addition- sorghum effect, mid-season corrections - cropping systems
2. Pearl millet – Origin - geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh- soil and climatic requirements -growth Stages - land preparation - seeds and sowing - Nutrient management - sater management - weed management – harvesting- yield attributes – yield - post harvest operations - value addition - cropping systems
3. Finger millet- Origin - geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh- soil and climatic requirements, growth Stages - land preparation, seeds and sowing - nutrient management - water management - weed management – harvesting - yield attributes – yield - post harvest operations - value addition - cropping systems

4. Proso millet, Little millet and Kodo millet – Origin - geographical distribution - economic importance - adaptations, soil and climatic requirements - growth Stages - land preparation - seeds and sowing - nutrient management - water management - weed management – harvesting - yield attributes – yield - post harvest operations

5. Foxtail millet, Barnyard millet- Origin - geographical distribution- economic importance – Adaptations - soil and climatic requirements - growth Stages- land preparation- seeds and sowing- nutrient management - water management - weed management- harvesting - yield attributes – yield - post harvest operations

6. Pulses- Economic importance - constraints for achieving higher productivity of pulses, strategies for improving the pulse production in India - climate resilient technologies

7. Pigeonpea- Origin - geographical distribution - economic importance- area, production and productivity in India and Andhra Pradesh - soil and climatic requirements - growth Stages - land Preparation - seeds and sowing – varieties - nutrient management - water management - weed management – harvesting- yield attributes – yield - post harvest operations - cropping systems

UNIT V (6hrs)

1. Greengram – Origin - geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh - soil and climatic requirements growth stages - land Preparation- seeds and sowing – varieties nutrient management -water management- weed management- harvesting- yield attributes – yield - post harvest operations - cropping systems

2. Blackgram – Origin- geographical distribution, - economic importance - area, production and productivity in India and Andhra Pradesh - soil and climatic requirements - growth stages - land Preparation - seeds and sowing – varieties- nutrient management - water management- weed management - harvesting- yield attributes – yield - post harvest operations - cropping systems

3. Bengalgram - Origin - geographical distribution- economic importance- area, production and productivity in India and Andhra Pradesh - soil and climatic requirements- growth stages -types of chick pea -land preparation - seeds and sowing- varieties- nutrient management- water management- weed management- harvesting- yield attributes – yield - post harvest operations - cropping systems

4. Lentil, peas- Origin- geographical distribution - economic importance- area, production and productivity in India and Andhra Pradesh - soil and climatic requirements- growth stages-types of lentil and peas - land Preparation - seeds and sowing – varieties- nutrient management- water management- weed management-harvesting- yield attributes – yield - post harvest operations - cropping systems

5. Horsegram- Origin- geographical distribution - economic importance - area, production and productivity in India and Andhra Pradesh - soil and climatic

requirements- growth stages - land Preparation- seeds and sowing – varieties-
nutrient management- water management- weed management- harvesting- yield
attributes – yield - post harvest operations - cropping systems

6. Cowpea- Origin - geographical distribution- economic importance - area,
production and productivity in India and Andhra Pradesh - soil and climatic
requirements - growth Stages - land preparation- seeds and sowing- varieties -
nutrient management- water management- weed management-harvesting- yield
attributes – yield - post harvest operations - cropping systems

References Text books

1. Rajendra Prasad. 2006. Text book of field crops production. ICAR, New Delhi.
2. Reddy, S.R. and Reddi Ramu. 5th edition. 2016. Agronomy of field crops. Kalyani publishers, Ludhiana.
3. Gururaj hunsigi and Krishna, K.R. 2007. Scientific field crop production. Oxford & IBH Publishing Co.Pvt.LTD.
4. De Datta, S.K.1981. Principles and practices of rice Production. John Wiley and Sons, New York

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: ECO-PHYSIOLOGY

Course Code: CPHY261

No. of Hrs:15

Credits: 1

THEORY

UNIT I (4hrs)

1. Ecophysiology – Introduction – Definition – Importance in agriculture and horticulture – Ecosystem – Definition of ecosystem, ecotypes and ecads – Biosphere and ecosystem – Sub divisions of biosphere – Pathways of energy in the biosphere – Concept of ecosystem – Components of ecosystem – Basic structure of ecosystem.

2. Different types of ecosystem – Freshwater, marine, forest and crop ecosystem – Energy in ecosystem – Productivity – Primary production – Secondary production – Types of food chains.
3. Global climates and crop distribution – Influence of climate on crop distribution (rice, wheat, maize, sorghum and sugarcane) – Important climatic regions of the world – Agro-climatic zones of India – Crop distribution in India and Andhra Pradesh.
4. Environment – Definition – Components – Biotic and abiotic environments – Biotic environment – Biotic factors and anthropic factors – Abiotic environment – Climatic, edaphic, physiographic and pyric factors – Climatic factors – Radiation – Effect of radiation on plant functions – Classification of ultraviolet (UV) radiation – Effects of UV-B radiation.

UNIT II (3hrs)

1. Abiotic environment – Climatic factors – Precipitation – Forms of precipitation – Effect of water deficit and water logging on plant processes – Temperature – Cardinal temperature – Effects of temperature on plant processes – Temperature injuries – High temperature and low temperature stress – Classification of plants based on heat resistance and cold resistance – Heat units.
2. Edaphic factors – Classification of plants based on adaptation to different soil types – Halophytes and salt stress tolerance mechanisms.
3. Physiographic factors – Altitude of the place, steepness of the slope, direction of mountain chain and exposure of the slope to light and wind – Effects of topographic factors on vegetation – Wind effect on physiological processes - Pyric factors – sources and type of fires – Effects of fire on vegetation and environment – management of fires and rejuvenation of crops.

UNIT III (3hrs)

1. Biotic factors – Herbivores (grazing effect), symbiosis (Mycorrhiza and Rhizobium associations), insectivorous plants, epiphytism and parasites - Anthropic factors – Industrialization – Shifting cultivation – Crop improvement.
2. Physiological approaches for climate resilient agriculture.
3. Competition – Ecological succession – Dominance and subordination – Types of competition – Inter-specific, intra-specific and intra-plant competition – Monoculture and polyculture – Multistoried cropping system – Mutual shading.

UNIT IV (2hrs)

1. Allelopathy – Definition – Concept – Sources of allelopathic chemicals in crop and weed species – Natural products identified as allelopathic chemicals – Mode of action – Scope for allelopathy.
2. Phyto-remediation – Definition – Concept – Applications in agriculture and industry.
3. Pollution – Air pollution – Sources – Physiological effects on plants and its Management - Water pollution – Sources – physiological effects on plants and its Management - Soil pollution – Sources – Physiological effects on plants and its Management

UNIT V (3hrs)

1. Global warming – Greenhouse effect – Causes of global warming – Methane, carbon dioxide, chloro fluoro carbons' (CFC), nitrous oxide (NO) gas and ozone – Impact of global warming on climate and agricultural productivity – Measures to reduce build-up of greenhouse gases.
2. Controlled environment – Purposes – Types – Designs of structure – Commercial applications.
3. Carbon dioxide fertilization – Definition – Concept – Importance – Sources – Methods of CO₂ fertilization – Effects on crop yields and limitations - Eco physiological models - Concept – Models for different environmental management.

References Text books

1. Agrwal, A. K. and Deo, P.P. 2013. Plant Ecology. Agrobios (India) Jodhpur
2. Varshneya, M. C and Balakrishna Pillai, P. 2006. Textbook of Agricultural Meteorology. ICAR, New Delhi
3. Lenka, S., Lenka, N.K., Kundu, S and Subba Rao, A. 2013. Climate change and Natural Resources Management, New India Publishing Agency, India
4. Prasad and Kumar. 2010. Green House Management for Horticulture Crops. Agrobios, Jodhpur.
5. Schulze, E.C., Beck, E and Muller-Hohenstein, K. 2005. Plant Ecology. Springer Science & Business Media, New York City

SYLLABUS

Subject: Agriculture and Rural Developments Semester: III
Course Title: Fundamentals of Entomology II (Insect Ecology & Concepts Of IPM)

Course Code: ENTO231

No. of Hrs: 15

Credits: 1

THEORY

UNIT I (4hrs)

1 Insect Ecology- Introduction, Autecology and Synecology-Population-Community Ecosystem – Agro - ecosystem -Environment and its components. Abiotic factors - Temperature-Its effect on the development, fecundity distribution, dispersal and movement of insects - Adaptations of insects to temperature - Thermal constant-Day degrees. Moisture- Adaptation of insects to conserve moisture. - Humidity- Its effect on development, fecundity and colour of body - Rainfall - Its effect on emergence, movement and oviposition of insects.

2 Light – Phototaxis - photoperiodism - Its effect on growth, moulting activity or behaviour, oviposition and pigmentation - Use of light as a factor of insect control; Atmospheric pressure and its effect on behavior. Air currents - Effect on dispersal of insects – Edaphic factors.

3 Biotic factors – Food - Classification of insects according to nutritional requirements - Other organisms - Inter and Intra specific associations - Beneficial and harmful associations of parasitoids based on site of attack, stage of host, duration of attack, degree of parasitism and food habits. Effect of biotic factors - Competition, natural and environmental resistance

4 Concepts of Balance of life in nature- Biotic potential and environmental resistance. - Factors contributing to increase or decrease of population - Causes for outbreak of pests in agro-ecosystem.

UNIT II (3hrs)

1 Practices, Scope and Limitations of IPM - IPM – Definitions, Concepts– Economic Threshold Level (ETL) – Economic Injury Level (EIL) and General Equilibrium Position (GEP) – Modified Equilibrium Position (MEP)- Components/tools of IPM

2 Pest surveillance and pest forecasting – Definition - Importance in IPM – Advantages - Components of pest surveillance, types of forecasting (short term and long-term forecasting and their advantages) – Insect pests – Definitions of negligible, minor and major pests; Different categories of pests – Regular, occasional, seasonal, persistent, sporadic, epidemic and endemic pests with examples.

3 Host-plant resistance- Principles of host plant resistance – Ecological resistance – Phenological asynchrony, induced resistance and escape – Genetic resistance – Mono, oligo and polygenic resistance – Major gene resistance (vertical/specific/ qualitative) and minor gene resistance (horizontal/nonspecific/quantitative) – Host- plant selection process- host habitat finding, host finding, host recognition, host acceptance and host suitability- Mechanisms of Genetic resistance- Non-preference (antixenosis), antibiosis and tolerance – Transgenic plants.

UNIT III (3hrs)

1 Components/tools of IPM: Cultural control- Normal and special cultural practices which incidentally control the pests and agronomic practices recommended specifically against the pests with examples.

2 Mechanical control- Different mechanical methods of pest control with examples.

3 Physical control – Use of inert carriers against stored product insects - steam sterilization – Solarization - Solar radiation - Light traps - Flame throwers etc.; Legislative measures - Importance of quarantine - Examples of exotic pests - Different legislative measures enforced in different countries including India.

UNIT IV (2hrs)

1 Biological control - Types of biological control – Introduction, augmentation and conservation – Advantages and disadvantages of biological control. Parasite – Parasitoid - Parasitism - Grouping of parasites based on nature of host, stage of host, site of parasitisation, duration of attack, degree of parasitisation and food habits – Kinds of parasitism – qualities/attributes of an effective parasitoid. Predators – Predatism – qualities of insect predator – Differences between predator and parasite.

2 Microbial control - Important groups of microorganisms - Bacteria, viruses and fungi used in pest control and their mass multiplication techniques - Transgenic plant pathogens – Bacteria, fungi and viruses - Entomopathogenic nematodes – Important species - Mode of infectivity and examples.

3 Chemical control - Importance and ideal properties of insecticide - Classification of insecticides based on origin, mode of entry, mode of action and toxicity with list of insecticides - Toxicity evaluation of insecticides - Acute or chronic toxicities, oral and dermal toxicities - LC50 (Median Lethal Concentration), LD50 (Median Lethal Dose), ED50 (Median Effective Dose), LT50 ((Median Lethal time), KD50 (Median Knockdown Dose) and KT50 (Median Knock Down Time) – Bioassay methods.

UNIT V (3hrs)

1 Formulations of insecticides - Dusts, granules, wettable powders, water dispersible granules, solutions, emulsifiable concentrates, suspension concentrates, concentrated insecticide liquids, fumigants, aerosols, gels, micro encapsulations, tablets, baits and mixtures of active ingredients – Advantages and disadvantages of chemical control

2 Recent methods of pest control - Repellents (physical and chemical), Antifeedants - importance of antifeedants and limitations of their use – Attractants - Sex pheromones - List of synthetic sex pheromones - Use in IPM - Insect hormones – Gamma irradiation –Genetic control – Sterile male technique.

3 Application techniques of spray fluids- High volume, low and ultra-low volume sprays - Compatibility of pesticides - Phytotoxic effects of insecticides - Safe use of pesticides - Symptoms of poisoning - First aid and antidotes for important groups of insecticides. Insecticide Act 1968-Important provisions - Insecticide resistance, resurgence and residues - Maximum Residue Limits (MRL) – Acceptable Daily Intake (ADI) – Safe waiting periods.

References text books

1. Vasantharaj David, B. and Rama Murthy V.V. 2016. Elements of Economic Entomology, Popular Book Depot, Coimbatore.
2. Vasantharaj David, B and Aanathakrishnan, T.N. 2006. General and Applied Entomology. Tata McGraw-Hill Publishing House, New Delhi.
3. Metcalf, R.L. and Luckman, W.H. 1982. Introduction to Insect Pest Management. Wiley Inter Science Publishing, New York.
4. Atwal, A. S. and Bains, S.S. 1989. Applied Animal Ecology. Kalyani Publishers, New Delhi
5. Yazdani, S.S. and Agarwal, M.L. 1979. Elements of Insect Ecology. Narosa Publishing House, New Delhi.
6. Dhaliwal, G.S. and Ramesh Arora 2001. Integrated Pest Management: Concepts and Approaches, Kalyani Publishers Ludhiana

SYLLABUS

Subject: Agriculture and Rural Development Semester: III

Course Title: Fundamentals of Plant Breeding

Course Code: GPBR211

No. of Hrs:30

Credits: 2

UNIT I: (6hrs)

1 Historical developments, concept, nature and role of plant breeding, major achievements and future prospects - Definition, aim, objectives, history and developments of plant breeding, scientific contributions of eminent scientists - Landmarks in plant breeding - Scope of plant breeding.

2 Modes of reproduction and apomixis - Asexual reproduction (vegetative reproduction and apomixis) and sexual reproduction - Their classification and significance in plant breeding.

3 Modes of pollination - Classification of crop species on the basis of mode of pollination- self-pollination – mechanisms promoting self-pollination – Genetic consequences of self-pollination – Cross pollination – Mechanisms promoting cross pollination – Genetic consequences of cross pollination – Often cross pollinated crops.

4 Self- incompatibility - Classification – Heteromorphic, homomorphic, gametophytic and sporophytic systems of incompatibility – Advantages and disadvantages – Utilization in crop improvement.

5 Male sterility- Genetic consequences, cultivar options - Different types – Genetic, cytoplasmic and cytoplasmic genetic male sterility – Inheritance and maintenance– utilization of male sterile lines in hybrid seed production – Their advantages and disadvantages.

6 Domestication, acclimatization and introduction - Plant introduction – Primary introduction and secondary introduction – Plant introduction agencies in India – National Bureau of Plant Genetic Resources (NBPGR) and its activities – Procedure of plant introduction – Merits and demerits of plant introduction.

7 Centre of origin/diversity - Centres of diversity– Centres of origin – Classification – law of homologous series – Types of centres of diversity – Germplasm collections – Genetic erosion – Main reasons of genetic erosion – Extinction - Gene sanctuaries - Introgression – Gene banks – Types of gene banks.

UNIT II (6hrs)

1. Breeding methods in self pollinated crops - Modes of selection - Selection – Natural and artificial selection – Basic principles of selection – Basic characteristics and requirements of selection – Selection intensity – Selection differential, heritability (narrow and broad sense) – Genetic advance as per cent of mean.

2 Mass selection – Procedure for evolving a variety by mass selection – Modification of mass selection – Merits, demerits and achievements.

3 Pure line selection - Johannsen's pure line theory and its concepts and significance – Origin of variation in pure lines – Characters of pure lines – Progeny test, genetic basis of pure line selection – General procedure for evolving a variety by pure line selection – Merits, demerits and achievements – Comparison between mass and pure line selection.

4 Hybridization techniques - Hybridization – Aims and objectives – Types of hybridization – Pre-requisites for hybridization – Procedure / steps involved in hybridization.

5 Handling of segregating population - Pedigree method – Procedure – Merits, demerits and achievements. 13 Bulk method – Procedure – Merits, demerits and achievements – Comparison between pedigree and bulk methods - Single seed descent method – Merits and demerits.

UNIT III (6hrs)

1 Backcross method of breeding–Its requirements and applications – Procedure for transfer of single dominant gene - Procedure for transfer of single recessive gene – Merits, demerits and achievements - comparison between pedigree and backcross method.

2 Multiline concept - Definition – Characteristics of a good multiline – Development of multiline varieties – Achievements.

3 Concepts of population genetics and Hardy - Weinberg Law - Hardy Weinberg Law – Factors affecting equilibrium frequencies in random mating populations - Selection without progeny testing – Selection with progeny testing - Merits and demerits of progeny selection – Line breeding– achievements.

4 Recurrent selection – Different types – Detailed procedure of simple recurrent selection and other recurrent selection methods – Conclusion on the efficiency of different selection schemes.

5 Heterosis - Heterosis and hybrid vigour – Luxuriance – Heterobeltiosis – Brief history– heterosis in cross pollinated and self pollinated species – Manifestations of heterosis

6 Genetic basis of heterosis – Dominance, over dominance and epistasis hypotheses – Objections and their explanations – Comparison between dominance and overdominance hypotheses – Physiological basis of heterosis

UNIT IV (6hrs)

1 Inbreeding depression - Brief history – Effects of inbreeding – Degrees of inbreeding depression – Procedure for development of inbred lines and their evaluation.

2 Development of inbred lines and hybrids - Exploitation of heterosis – History of hybrid varieties – Important steps in production of single and double cross hybrids – Brief idea of hybrids in maize, pearl millet, sunflower and rice.

3 Composite and synthetic varieties - Production procedures – Merits, demerits and achievements – Factors determining the performance of synthetic varieties – Comparison between synthetics and composites.

4 Breeding methods in asexually propagated crops, clonal selection and hybridization - Characteristics of asexually propagated crops – Characteristics of clones – Clonal selection – Procedure – Advantages and disadvantages – Problems in breeding asexually propagated crops – Genetic variation within a clone – Clonal degeneration – Achievements – Comparison among clones, purelines and inbreds - Breeding of annual asexually propagated species through hybridization – Interspecific hybridization.

5 Wide hybridization and pre-breeding - History – Objectives – Barriers for the production of distant hybrids– Techniques for production of distant hybrids – applications of wide hybridization in crop improvement – Sterility in distant hybrids – Limitations and achievements -use of gene pools to develop intermediate breeding material.

6 Polyploidy in relation to plant breeding - Polyploidy – Autopolyploids – Origin and production – Morphological and cytological features– Applications in crop improvement – Limitations– Allopolyploidy – Morphological and cytological features– Applications in crop improvement – Limitations.

7 Mutation breeding - Methods and uses - Mutation breeding – Procedure of mutation breeding – Applications – Advantages, limitations and achievements.

UNIT V (6hrs)

1 Breeding for important biotic and abiotic stresses - Disease resistance – Mechanisms of disease resistance in plants (disease escape, tolerance, resistance, immunity and hypersensitivity) – Genetic basis of disease resistance – Gene for gene hypothesis – sources of disease resistance – Breeding methods for disease resistance – Achievements.

2 Insect resistance – Mechanism of insect resistance in plants (non preference, antibiosis, tolerance and avoidance) – Nature of insect resistance – Genetics of insect resistance – Horizontal and vertical resistance– Sources of insect resistance – breeding methods for insect resistance – Problems in breeding for insect resistance – Achievements.

3 Drought resistance – Mechanisms of drought resistance (drought escape, avoidance, tolerance, and resistance) – Features associated with drought resistance – Sources of drought resistance – Breeding methods for drought resistance – Limitations – achievements - Resistance to water logging – Effects of water logging - Mechanism of tolerance – Ideotype for flooded areas.

4 Salt tolerance – Response of plants to salinity – Symptoms – Mechanisms of salt tolerance – Breeding methods for salt tolerance – Problems – Achievements. Cold tolerance – Chilling resistance – Effects of chilling stress on plants –

Mechanism of chilling tolerance – Sources of chilling tolerance – Selection criteria.

5 Biotechnological tools - DNA markers and marker assisted selection - Definition and classification of DNA markers and applications.

6 Participatory plant breeding - Definition – Goals – Methodology – Advantages and limitations.

References text books

1. Phundan Singh, 2014. Essentials of Plant Breeding. Kalyani Publishers, New Delhi.
2. Singh, B.D. 2015. Plant Breeding: Principles and Methods. Kalyani Publishers, New Delhi.
3. Gupta, S.K. 2010. Plant Breeding Theory and Techniques. Wiley India Pvt. Ltd. New Delhi.
4. Allard, R.W. 2010. Principles of Plant Breeding. John Wiley and Sons, New York.
5. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford and IBH Publishing Co., New Delhi.
6. Sharma, J.R. 1994. Principles and Practice of Plant Breeding. Tata McGraw Hill, Publishing Company Ltd., New Delhi. GPBR 311 CROP IMPRO

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Production Technology for Vegetables and Spices

Course Code: HORT281

No. of Hrs:15

Credits: 1

vegetables, fruits and spices and seed production techniques.

THEORY

UNIT I (4hrs)

1. Importance of vegetables and spices in human nutrition and national economy – Classification of vegetables - 1) Botanical 2) Based on Hardiness 3) Parts Used 4) Method of culture 5) Season.

2. Tomato- Botanical Name – Family – Origin – Area – Production- Improved varieties and cultivation practices such as time of sowing - Sowing - Transplanting techniques - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

3. Brinjal and Chilli - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Transplanting techniques - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Disease and pest control and seed production.

4. Okra and Leafy vegetables (Amaranthus and Gogu) - Botanical name – Family - Origin - area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Disease and pest control and seed production.

UNIT II (3hrs)

1. Cucurbits – Flowering, sex expression, sex ratio - Cucumber, Ridge gourd, Bitter gourd, Bottle gourd- Botanical name – Family - Origin - Area - Production - improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

2. Melons – Watermelon and Muskmelon - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield – Production of seedless watermelons - Storage - Physiological disorders - Disease and pest control and seed production.

3. Cole crops- Cabbage and Cauliflower -Botanical name – Family - Origin - Area - production - Improved varieties and cultivation practices such as time of sowing - sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield –Storage - Physiological disorders - Disease and pest control and seed production.

UNIT III (3hrs)

1. Peas and beans (Cluster bean, French bean, Dolichos) - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of Sowing - sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield –Storage - Physiological disorders - Disease and pest control and seed production.

2. Root crops (Carrot and Radish) - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing

- Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders (splitting, forking and cavity spot) - Disease and pest control and seed production.

3. Tapioca and Sweet potato - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

UNIT IV (3hrs)

1. Perennial vegetables – Drumstick and Curry Leaf- Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

2. Bulb crops – Onion and Garlic - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

3. Black pepper - Botanical name – Family - Origin - Introduction - Varieties - Climate- Soil – Systems of cultivation -propagation - Planting - Shade regulation - Training and pruning - Fertilizer requirements - Irrigation - Intercultural operations - Harvesting – Processing - Yield - Pests and diseases.

UNIT V (2hrs)

4. Cardamom - Botanical name – Family - Origin - Introduction - Varieties - Climate-soil –Systems of cultivation - Propagation - Planting - Shade regulation – Fertilizer requirement - Irrigation - Intercultural operations - Harvesting – Processing - Yield - Pests and diseases.

5. Ginger and Turmeric – Botanical name – Family - Origin - Introduction - Varieties - Climate- Soil – Systems of cultivation - Propagation - Planting - Mulching – Fertilizer requirement - Irrigation - Intercropping - intercultural operations - Harvesting – Processing - yield - Pests and diseases – Preservation of seed rhizomes.

6. Cinnamon - Coriander and Fenugreek- Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing sowing - Transplanting techniques - Fertilizer requirements - Irrigation - Intercultural operations - Harvesting - Pests and Diseases

References text books

1. Pranab Hazra, A. Chattopadhyay, K. Karmakar and S. Dutta. 2010. Modern Technology in Vegetable Production. New India Publishing Agency, New Delhi.
2. Neeraj Pratap Singh, .2007. Basic Concepts of Vegetable Science. International Book Distributing Co. New Delhi. Academic Press, New Delhi.
3. Nempal Singh, Singh, D.K., Singh, Y.K. and Virendra Kumar. 2006. Vegetable Seed Production Technology. International Book Distributing Co. Lucknow.
4. Prem Singh Arya and S. Prakash 2002. Vegetables Growing in India. Kalyani publishers, New Delhi
5. Bose, T. K, Kabir, J., Maity T. K., Parthasarathy V. A., and Som M. G., 2002. Vegetable Crops Vol. II & III Naya Prokash, Kolkata.
6. Shanmugavelu, K.G., N. Kumar and K.V. Peter 2005. Production Technology of Spices and Plantation Crops. Agrobios (India), Jodhpur.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Fundamentals of Plant Pathology-II

Course Code: PATH 271

No. of Hrs:15

Credits: 1

THEORY

UNIT I (4hrs)

1. History of Plant Pathology with special reference to Indian work-contributions of Anton de Bary, Woronin, Oscar Brefeld, Marshal Ward, Millardet, Butler, Mundkur, Stakman, Dastur, Mehta, Sadasivan.
2. Terms and concepts used in plant Pathology - disease - disorder - pathogen - parasite - pathogenicity - pathogenesis - sign - symptom - syndrome - biotroph - hemibiotroph - perthotroph (necrotroph) - inoculum - inoculum potential - infection - incubation period - predisposition - hypersensitivity - epidemic - endemic and sporadic diseases.
3. Survival of plant pathogens - kinds of inoculum - primary and secondary inoculum - pattern of survival - infected host (main host, alternate host and collateral host) - saprophytic survival outside the host (soil, root inhabitants and rhizosphere colonizers) dormant spores or structures (seed borne, soil borne and on infected plant parts).
4. Dispersal of plant pathogens - active dispersal - seed, soil and plant parts, passive dispersal - air, water, members of animal kingdom (agents with examples), fungi and phanerogamic parasites.

UNIT II (3)

1. Phenomenon of infection - process of infection - pre-penetration, penetration and post-penetration. Pre-penetration in fungi (spore germination, germ tube growth, formation of specialized structures like appressorium and rhizomorphs), bacteria and virus. Penetration - indirect penetration through wounds or natural openings like stomata, hydathodes and lenticels - direct penetration through plant surface (cutinized and non cutinized surfaces) by chemical or mechanical methods. Post penetration - colonization of the host.
2. Pathogenesis - role of enzymes, toxins, growth regulators and polysaccharides in plant diseases with examples. Enzymes - cutinases, pectinases, cellulases, lignases, proteases and lipases.
3. Toxins - pathotoxins, phytotoxins and vivotoxins - selective (host specific) and non-selective (host non-specific) toxins. Growth regulators - growth promoting substances (auxins, gibberellins and cytokinins) and growth inhibiting substances and polysaccharides.

UNIT III (2)

1. Defense mechanisms in plants - pre-existing structural defense mechanisms - waxes, thick cuticle and epidermal cell wall - structure of natural openings, internal structural barriers – postinfectious structural defense - histological defense (cork layer, abscission layer, tyloses and gum deposition) and cellular defense (hyphal sheathing) structures.
2. Biochemical defense mechanisms - pre-existing biochemical defense mechanisms - inhibitors released by the plant in its environment (protocatechuic acid and catechol) and inhibitors present in the plant cell (phenolic compounds - chlorogenic acid) – post infectious defense mechanisms - phytoalexins, hypersensitive reaction - defense through plantibodies.
3. General principles of plant disease management - importance - general principles - avoidance of the pathogen (selection of pathogen free propagating material and seed, selection of field, choice of time of sowing and disease escaping varieties), - exclusion - plant quarantine and inspection, quarantine rules and regulations.

UNIT IV (3hrs)

1. Eradication - cultural methods of eradication (rouging, eradication of alternate and collateral host, crop rotation, manure and fertilizer management, mixed cropping, sanitation, summer ploughing, soil amendments, time of sowing, seed rate and plant density, irrigation and drainage).
2. Physical methods of eradication- solarization and hot water treatment; Biological methods - role of biological control - mechanisms - competition, antibiosis, hyperparasitism, Systemic Acquired Resistance (SAR) and Induced Systemic Resistance (ISR).
3. Important fungal and bacterial biocontrol agents (*Trichoderma* spp, *Pseudomonas fluorescens*, *Bacillus subtilis* and *Ampelomyces quisqualis*) - Plant Growth Promoting Rhizobacteria (PGPR) against phytopathogens.

UNIT V (3hrs)

1. Contact and systemic fungicides against lower fungi, downy mildews, powdery mildews, rusts, smuts, coloured fungi, leaf spots and blights. Chemicals for soil drenching.
2. Mode of action and Formulations of fungicides, Antibiotics and their formulations.
3. Introduction to botanicals and other non-chemical preparations used in the disease management in organic and natural farming systems.

References text books

1. Agrios, G.N. 2005. Plant Pathology. Elsevier Academic Press, New York.
2. Chaube, H.S. and Ramji Singh. 2001. Introductory Plant Pathology. International Book Distribution Co., Lucknow. 136

3. Mehrotra, R.S. 1980. Plant Pathology. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
4. Singh, R.S. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH Publ. Co.Pvt. Ltd., New Delhi.
5. Vidyasekharan, P. 1993. Principles of Plant Pathology. CBS Publishers and Distributors, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: III

Course Title: Bee Keeping

Course Code: 20SDCBK2

No. of Hrs:30

Credits: 0+2

Syllabus

UNIT-I

Introduction to Bee Keeping

History, Present scenario & scope

Selection of beespecies & races

Identification of flora and location of site

UNIT-II

Procurement of bee box and other tools

Building & division of comb and colony

Manage insects and diseases

UNIT-III

Knowledge the scientific methods of bee keeping

Bee Boxes Maintenance

UNIT-IV

Raw production at different life stages of bees

Collection and preservation of honey

UNIT-V

Harvest, process and market the produce

SYLLABUS

Subject: Agriculture and Rural Development Semester: III

Course Title: Farm Machinery and Power-Practical

Course Code: AENG251P

No. of Hrs:30

Credits:1

PRACTICALS

1. Showing the difference between EC engine and constructional details of IC engine.
2. Dismantling the IC engine and explaining the functional aspects of components.
3. Air cleaning and maintenance - Engine cooling and maintenance.
4. Familiarizing with lubrication and fuel supply system of an engine.
5. Familiarizing with clutch – Gearbox - Differential and final drive along with brake steering hydraulic control of tractor.
6. Familiarization with primary tillage implements like M. B. Plough, disc plough and its adjustments.
7. Study of secondary tillage implements and its constructional details -Emphasis on disc harrow, spike tooth harrow, blade harrow, rotavator, power harrow
8. Familiarization with seed metering mechanism and its calibration.
9. Study on planters and transplanters.

SYLLABUS

Subject: Agriculture and Rural Development Semester: III

Course Title: Fundamentals of Agricultural Extension-Practical

Course Code: AEXT291P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Audio-visual aids – Meaning, importance and classification - Selection, planning, preparation, evaluation, presentation and use of audio-visual aids – Charts.
2. Selection, planning, preparation, evaluation, presentation and use of audio-visual aids – Charts, posters, flip charts, flash cards, planel graphs.
3. Selection, planning, preparation, evaluation, presentation and use of audio-visual aids – Power point slides.
4. Planning and preparation of extension literature – Leaflet, folder, pamphlet, booklet, news stories and success stories.
5. Handling and use of audio visual equipments such as public address equipment (PAE) system and still camera and digital camera and Liquid Crystal Display (LCD) Projector.
6. Group discussion – Simulated exercise

7. Visit to KVK.
8. Visit to Farmers' Training Centre (FTC).
9. Visit to District Agricultural Advisory and Transfer of Technology Centre (DAATTC).
10. Visit to study organization and functioning of DRDA, DWMA, ATMA, JDA Office and other development departments at district level.
13. Visit to a village to exercise PRA techniques

SYLLABUS

Subject: Agriculture and Rural Development Semester: III

Course Title: Crop Production Technology – I - Practical

Course Code: AGRO 201P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Raising of rice nurseries including SRI nursery for mechanical transplanting
2. Transplanting of rice
3. Identification of seeds /crops and calculation of seed rate
4. Land preparation and layout of student plots
5. Sowing of crops in student plots
6. Study of the effect of seed size on germination and seedling vigour
7. Identification and management of weeds in cereals and pulses
8. Fertilizer application (top dressing and foliar feeding of nutrients)
9. Agronomic characters of cereal crop varieties
10. Agronomic characters of millet crop varieties
11. Agronomic characters of pulse crop varieties

PRACTICAL SYLLABUS

Subject: Agriculture and Rural Development

Semester: III

Course Title: Eco-Physiology-Practical

Course Code: CPHY261P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Hydrophytes - Morphological and anatomical adaptations to Excess
2. Mesophytes - Morphological and anatomical adaptations to mesic conditions

3. Xerophytes - Morphological and anatomical adaptations to Water deficit
4. Effects of light and shade on crop growth
5. Influence of different soils on crop growth
6. Analysis of competition in crop plants
7. Measurement of microclimate in contrast crop canopies
8. Effect of dust pollution on crop growth
9. Effect of soil pollution on crop growth

SYLLABUS

Subject: Agriculture and Rural Developments Semester: III

Course Title: Fundamentals of Entomology II-Practical

Course Code: ENTO231P

No. of Hrs:30

Credits:1

EXPERIMENTS

- 1 Sampling techniques for the estimation of insect population in different crops
- 2 Study of distribution patterns of insects in crop ecosystems
- 3 Techniques for the estimation of insect damage in different crops
- 4 Pest surveillance through light traps, pheromone traps and forecasting of pest incidence
- 5 Acquaintance of insecticide formulations
- 6 Calculation of doses/ concentrations of different insecticidal formulations
- 7 Compatibility of pesticides with other agrochemicals and phytotoxicity of insecticides
- 8 Acquaintance of mass multiplication techniques of important predators – Cryptolaemus.
- 9 Acquaintance of mass multiplication techniques of the egg parasitoid, Trichogramma
- 10 Acquaintance of mass multiplication techniques of Ha NPV and SI NPV

SYLLABUS

Subject: Agriculture and Rural Development **Semester: III**

Course Title: Fundamentals of Plant Breeding-Practical

Course Code: GPBR211P

No. of Hrs:30

Credits:1

EXPERIMENTS

- 1 Plant Breeder's kit.
- 2 Study of germplasm of various crops.
- 3 Emasculation and hybridization techniques in self-pollinated crops – rice, groundnut.
- 4 Emasculation and hybridization techniques in self-pollinated crops – greengram, sesame.
- 5 Emasculation and hybridization techniques in cross pollinated crops – maize, castor.
- 6 Emasculation and hybridization techniques in often cross-pollinated crops – cotton, redgram.
- 7 Consequences of inbreeding on genetic structure of resulting populations.
- 8 Study of male sterility systems.

SYLLABUS

Subject: Agriculture and Rural Development **Semester: III**

**Course Title: Production Technology for Vegetables and Spices-
Practical**

Course Code: HORT281P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Identification of vegetables and their seeds.
2. Identification of spices crops and their seeds.
3. Nursery raising techniques of vegetable crops.
4. Direct seed sowing and transplanting.
5. Study of morphological characters of different vegetables.

6. Study of morphological characters of different spices.
7. Physiological disorders of vegetable crops.
8. Intercultural operations in vegetable crops.
9. Fertilizers application methods.
10. Seed extraction methods in vegetables.

SYLLABUS

Subject: Agriculture and Rural Development Semester: III

Course Title: Fundamentals of Plant Pathology-II-Practical

Course Code: PATH271

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Acquaintance with various laboratory equipment.
2. Preparation of culture media Potato Dextrose Agar (PDA) for fungi and Nutrient Agar (NA) for bacteria.
3. Isolation of fungal and bacterial pathogens.
4. Preservation of disease samples - dry and wet methods.
5. Demonstration of Koch's postulates for fungi.
6. Demonstration of Koch's postulates for bacteria.
7. Study of different groups of fungicides and antibiotics.
8. Preparation of fungicides - Bordeaux mixture, Bordeaux paste and cheshunt Compound.
9. Methods of application of fungicides - soil application.
10. Methods of application of fungicides - seed treatment.

Subject: Agriculture and Rural Development Semester: IV

Course Title: Agricultural Marketing, Trade and Prices

Course Code: AECO242

No. of Hrs:30

Credits: 2

UNIT – 1 (6hrs)

1. Agricultural Marketing - Concepts and definitions of market, marketing, agricultural marketing - Components of market, dynamics of market structure.
2. Classification and characteristics of each type of agricultural markets.
3. Demand and supply of Agri-commodities, factors affecting the demand and supply of farm products, producer's surplus - Meaning and types and producer's surplus of Agri-commodities in India.
4. Meaning of marketable surplus and marketed surplus, importance and their measurement. marketable surplus and marketed surplus of Agri-commodities in India, factors affecting them.
5. Marketing process and functions - Marketing process - Concentration, dispersion and equalization - Thompson's classification.
6. Exchange functions – Buying and selling, methods - Physical functions – Storage, transportation and processing.

UNIT – 2 (6hrs)

1. Facilitating functions – Packing and packaging, branding, grading, standardization, FAQs for major crop produce, quality control and labeling - AGMARK, HACCP, FSSAI, CODEX - Need for codex certification and relevance.
2. Market functionaries - Types and importance of agencies involved in agricultural marketing and their role - Producers, middlemen (merchant middlemen, agent middlemen, speculative middlemen, processors, facilitative middlemen).
3. Meaning and definition of marketing channels and supply chain management and their importance.
4. Marketing mix - Meaning, 4Ps of marketing - Product, price, place and promotion Their importance and characteristics in agriculture.
5. Meaning and stages in PLC (Product Life Cycle) - Characteristics of PLC - Strategies in different stages of PLC.
6. Pricing and promotion strategies - Pricing considerations and approaches – Cost based and competition-based pricing.
7. Market promotion – Advertising, personal selling, sales promotion and publicity – Their meaning and merits and demerits.

UNIT – 3 (6hrs)

1. Market Segmentation-Meaning and its importance, types of market segmentation and benefits.

2. Market Integration - Meaning, definition - Marketing efficiency - Meaning, definition, measurement of marketing efficiency - Types of market integration and marketing efficiency.
3. Marketing costs, margins and price spread - Meaning and measurement, factors affecting cost of marketing - Reasons for higher marketing costs of farm commodities - Ways of reducing marketing costs.
4. Regulated Markets-Definition - Important features of regulated markets - Functions, progress and defects.
5. Model regulated market act, objectives and features - APMC Act in Andhra Pradesh - Objectives and features and functions
6. Govt. interventions in agricultural marketing, their need, importance, and role Important market acts - Public sector institutions - CWC, SWC, FCI, & DMI – Objectives and functions.

UNIT- 4 (6hrs)

1. Cooperative marketing - Meaning and its need and importance, cooperative marketing agencies in India - NAFED, MARKFED – Objectives and functions and activities.
2. Risk in marketing - Types of risk in marketing - Measures to minimize risks, speculation and hedging - Meaning, differences between speculation & hedging, advantages, disadvantages and process of speculation and hedging.
3. An overview of futures trading in agricultural commodities - Forward/future markets - Meaning, advantages and disadvantages of forward markets.
4. Commodity exchanges – Role and importance - Commodity exchanges in India MCX, NCDX, NCMX, ACX, Safal - Role of regulatory bodies in futures markets - SEBI, etc, Contract farming - Meaning, procedures and advantages - Contract farming act in Andhra Pradesh.
5. Meaning and functions of price - Characteristics of agricultural product prices Agricultural price stabilization - Need for agricultural price policy - Role of Commission for Agricultural Costs and Prices (CACP) - Meaning of administered prices - Minimum support price, procurement price and issue price, levy price.
6. Concept of International Trade and its importance in globalised world economies Free trade and protectionism - Meaning, pros and cons of free trade and protectionism.

UNIT – 5 (6hrs)

1. Theory of absolute and comparative advantage and their importance international trade.
2. Trends, present status and prospects of Indian agri-commodities trade in international trade.
3. WTO - Genesis, objectives, functions and principles of multilateral trade.

4. WTO agreements - Agreement on Agriculture (AoA) - Market access, Aggregate Measures of Support (AMS), export subsidies, sanitary and phytosanitary measures (SPS) and their implications and impact on Indian agriculture.
5. TRIPS and intellectual property rights and their implications to Indian agriculture Meaning of patents, copy rights, trademarks, geographical indications, industrial designs, trade secrets, integrated circuits, and plant varieties protection.

Reference text books

1. S S Acharya and N L Agarwal. 2012. Agricultural Marketing in India. Oxford & IBH Publications Co. Pvt. Ltd., New Delhi.
2. S S Acharya and N L Agarwal. Agricultural Price: Analysis and Policy. Oxford & IBH Publications Co. Pvt Ltd., New Delhi.
3. Subba Reddy, S., P.Raghu Ram., Sastry, T.V.N and Bhavani Devi, I. 2016. Agricultural Economics. Oxford & IBH Publishing Company Private Ltd., New Delhi,
4. Kahlon, A.S and Tyagi.D S. 1983. Agricultural Price Policy in India. Allied Publishers Pvt. Ltd., New Delhi.
5. Mamoria, C.B. and Joshi. R L.1995. Principles and Practices of Marketing in India. Kitab Mahal, Allahabad
6. Philip Kotler, Kevin Lane Keller, Abraham Koshy and Mithileswar Jha. 2009. Marketing Management: A South Asian Perspective. International 13th edition. Pearson Prentice Hall

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

Course Title: Renewable Energy and Green Technology

Course Code: AENG252

No. of Hrs:15

Credits: 1

Theory

UNIT -I (3 Hours)

1. Introduction - Renewable energy sources, classification, advantages and disadvantages.
2. Biomass - Importance of biomass, classification of energy production - Principles of combustion, pyrolysis and gasification.
3. Biogas - Principles of biogas production, advantages, disadvantages, utilization.
4. Biogas plants - Classification, types of biogas plants, constructional details of biogas plants.

UNIT-II (3 Hours)

1. Types of gasifiers - Producer gas and its utilization.
2. Briquettes, briquetting machinery – Types and uses of briquettes - Shredders.
3. Solar energy – Application of solar energy, methods of heat transfer, conduction, convection and radiation.

UNIT-III (3 hours)

1. Solar appliances - Flat plate collectors, focusing type collectors, solar air heater.
2. Solar space heating and cooling - Solar energy gadgets, solar cookers, solar water heating systems.
3. Solar grain dryers, solar refrigeration system, solar ponds.

UNIT -IV (3 Hours)

1. Solar photovoltaic system - Solar lantern, solar street lights, solar fencing, solar water pumping system.
2. Wind energy - Advantages, disadvantages, wind mills and types.
3. Constructional details of wind mills, applications of wind mills.

UNIT-V (3 hours)

1. Biofuels – Characteristics of various biofuels, different parameters and calorific values.
2. Bio diesel production – Applications, extraction from jatropha.
3. Ethanol from agricultural produce (sugarcane and corn).

References text books

1. Rai, G.D. 2004. Non-conventional Energy Sources. Khanna Publishers, New Delhi.
2. Rajput, R. K. 2012. Non-conventional Energy Sources. S. Chand Publishers.
3. Ojha, T.P. and Michael, A.M. Principles of Agricultural Engineering. Vol. I, Jain Brothers, New Delhi.
4. Rathore, N.S., Mathur, A.N. and Kothari, S. Alternate Sources of Energy. ICAR Publication.

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

**Course Title: Entrepreneurship Development and Business
Communication**

Course Code: AEXT292

No. of Hrs:15

Credits: 1

Theory

UNIT –I (3 Hours)

1. Concept of entrepreneur, entrepreneurship - Distinction between an entrepreneur and a manager - Management - Management functions – Planning - Organizing - Directing - Motivation - Ordering - Leading – Supervision Communication and Control.
2. Characteristics of entrepreneurs - Opportunities for entrepreneurship and rural entrepreneurship - Types of entrepreneurs and functions of entrepreneurship.
3. Agri – entrepreneurship - Concept, need and scope - Assessing overall business environment in Indian economy and globalization and the emerging business entrepreneurial environment.
4. Entrepreneurship development programmes (EDPs) – Objectives, phases, problems of EDPs - Entrepreneurial behavior and role of achievement - Motivation, factors affecting entrepreneurship development.

UNIT –II (3 Hours)

1. Generation, incubation and commercialization of business ideas - Environment scanning and opportunity identification - Researching/ Managing competition Ways to define possible Competitors.
2. Globalization and the emerging business entrepreneurial environment - Role of ED in economic development of a country - Overview of Indian social, political systems and their implications for decision making by individual entrepreneurs.
3. SWOT Analysis - Concept, meaning and advantages.

UNIT –III (3 Hours)

1. Government policies, incentives, programmes and schemes for entrepreneurship development - Export and import policies relevant to Indian Agriculture sector.
2. Institutional support - Financial Institutions and other agencies in entrepreneurship development
3. Venture capital (VC), contract farming (CF) and joint ventures (JV) - Public-private partnerships (PPP).

UNIT – IV (3 hours)

1. Overview of agricultural input industry – Seed, fertilizer, pesticides, farm machinery and agricultural food processing industry.
2. Steps in establishment of MSME Enterprise - Planning of an enterprise - Project identification - Selection of the product/ services - Selection of form of ownership - Registration, selection of site, capital sources, acquisition of manufacturing know how, packaging and distribution.
3. Project planning - Formulation and project report - Meaning - Importance Components and preparation.

UNIT – V (3 Hours)

1. Supply chain management - Meaning, advantages, stages and process and total quality management.
2. Marketing management - Market types - Marketing assistance - Market strategies - Definition of business - Stakeholders in business - Stages of Indian business Importance of agribusiness in Indian economy -Social responsibility of business - Morals and ethics in enterprise management.
3. Assessment of entrepreneurship skills - Business leadership skills Communication skills for entrepreneurship development - Developing organizational skill - Developing managerial skills - Problem solving skill and time management skills.

Reference Books

1. Anil Kumar, S., Poornima, S. C., Mini, K., Abraham and Jayashree, K. 2003. Entrepreneurship Development. New Age International Publishers, New Delhi 2 Bhaskaran, S. 2014. Entrepreneurship Development & Management. Aman Publishing House, Meerut
2. Gupta, C.B. 2001. Management: Theory and Practice. Sultan Chand and Sons, New Delhi 4 Indu Grover 2008. Handbook on Empowerment and Entrepreneurship. Agrotech Publishing Academy, Udaipur
3. Khanka, S.S. 1999. Entrepreneurship Development. S. Chand and Co., New Delh

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

**Course Title: Irrigation water management, farming systems and
Sustainable Agriculture**

Course Code: AGRO203

No. of Hrs: 30

Credits: 2

THEORY

UNIT -1 (6hrs)

1. Farming System – introduction – scope of farming system – importance – concept – principles of farming system.
2. Types of farming systems – advantages and limitations - suitability – factors affecting the farming system
3. Farming systems – system and systems approach - determinants of farming system – cropping systems (navadhanya concept) and related terminology
4. Allied enterprises – significance of integrating crop and livestock enterprises – components and maintenance- dairying and sheep and goat rearing – breeds – housing– feed and fodder requirements – biogas plant
5. Allied enterprises – poultry farming – breeds – housing –feed and fodder requirements – apiculture – species and management
6. Allied enterprises – sericulture – moriculture and silkworm rearing – agro-forestry systems suitable for dryland farming
7. Tools for determining production and efficiencies in different farming and cropping systems.

UNIT-II (6hrs)

1. Adverse effects of modern agriculture - sustainable agriculture –definition – concept – goals – elements.
2. Problems related to soil, water and environment - adaptation and mitigation strategies - indicators of sustainability.
3. Conservation agriculture – concept – need - management of natural resources land, water and vegetation.
4. Techniques for sustainability - Low External Input Agriculture (LEIA) and Low External Inputs for Sustainable Agriculture (LEISA) and HEIA (High External Input Agriculture).
5. Integrated farming system-historical background, objectives and characteristics advantages
6. Site specific development of IFS models for different agro climatic zones of India and A.P.

UNIT -III (6hrs)

1. Resource use efficiency – optimization of resource use by different methods in an IFS (Annapurna model)
2. Resource cycling - flow of energy in different farming systems. Visit of IFS model in different agro-climatic zones of nearby states University/ institutes and farmers field
3. Introduction – importance – definition and objectives - water resources of world.
4. Surface and ground water resources in India and Andhra Pradesh–important major irrigation projects in India and Andhra Pradesh.
5. Soil-water relations – physical properties of soil viz., depth, soil texture, soil structure, particle density, bulk density and porosity influencing water retention, movement and availability.
6. Water retention in soil – adhesion and cohesion – soil moisture tension – pF – soil moisture characteristic curves- Water movement in soils – infiltration – percolation – seepage – permeability – hydraulic conductivity – saturated and unsaturated water flow.

UNIT -IV (6hrs)

1. Kinds of water in soil – gravitational water – capillary water – hygroscopic water – their importance in crop production - Soil moisture constants – saturation – Field capacity (FC) – Permanent Wilting Point (PWP) – Available Soil Moisture (ASM) – hygroscopic coefficient –theories of soil water availability.
2. Plant-water relationships – rooting characteristics – effective root zone depth – moisture extraction pattern – moisture sensitive periods of crops – Soil Plant Atmospheric Continuum (SPAC).

3. Evapotranspiration – evaporation – transpiration – factors influencing evapotranspiration – Reference crop evapotranspiration (ET_o) – Crop coefficient – Crop Evapotranspiration (ET_c) - daily, seasonal and peak period consumptive use.
4. Crop water requirement – irrigation requirement – net and gross irrigation requirement – irrigation interval – irrigation period – seasonal water requirement of important crops – duty of water – base period – relation between duty and base period – conjunctive use of water – advantages of conjunctive use.
5. Scheduling of irrigation – different criteria – soil moisture regime approach – feel and appearance method – soil moisture tension and depletion of available soil moisture method - climatological approach – Irrigation Water (IW) / Cumulative Pan Evaporation (CPE) ratio method.
6. Scheduling of irrigation – plant indices approach – visual symptoms – soil cums and mini plot technique – growth rate – relative water content – plant water potential – canopy temperature – indicator plants and critical growth stages.

UNIT – V (6hrs)

1. Methods of irrigation - surface methods – wild flooding check basin, ring basin, border strip, furrow and corrugations – advantages and disadvantages- Sub surface irrigation.
2. Micro irrigation systems - sprinkler irrigation – merits and demerits – system components and layout – suitable crops – rain guns.
3. Drip irrigation (surface and sub surface) – merits and demerits – system components and layout – suitable crops - fertigation and maintenance of micro irrigation systems.
4. Water Use Efficiency (WUE) – crop and field water use efficiency – factors influencing WUE – climatic, genetic and management (agronomic) factors - Irrigation efficiencies – water conveyance efficiency, water application efficiency, water storage efficiency, water distribution efficiency and project efficiency.
5. Quality of irrigation water – salinity hazard, sodium hazard, residual sodium carbonate and boron toxicity – criteria and threshold limits – management practices for using poor quality water.
6. Water logging – causes for waterlogging – drainage- surface and sub-surface drainage systems – relative merits.

References text books

1. Michael, A.M. 2006. Irrigation – Theory and Practice. Vikas Publishing House Pvt. Ltd., New Delhi. Reddy, S.R. 2016.
2. Arun K. Sharma. 2006. A hand book of organic farming - Agrobios (India) Jodhpur

3. Jayanthi C, Devasenapathy P and Vinnila, C. 2008. Farming systems principles and practice. Satish serial publishing house, Delhi
4. Panda.S.C. 2011. Cropping and farming systems. Agrobios (India) Jodhpur.
5. Ruthenburg, H. 1980. Farming systems in the tropics. Oxford university

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

**Course Title: Crop Production Technology–II (Oil Seeds, Fiber,
Sugar, Tobacco And Fodder Crops)**

Course Code: AGRO202

No. of Hrs:30

Credits: 2

Theory

UNIT -1 (6 Hours)

1. Importance of oilseed crops- edible and non – edible oils – nutritional value importance in Indian economy- constraints in oilseed production.
2. Need for improvement of productivity and production of oilseeds -climate resilient technologies- Groundnut – Origin - geographical distribution -area, production and productivity in India and Andhra Pradesh- economic importance
3. Soil and climatic requirements - types - growth stages - land Preparation - seeds and sowing- seed treatment-seed rate-spacing-season-time and method of sowing varieties
4. Water management -weed management- yield attributes –yield- harvesting, postharvest operations- quality considerations -cropping systems – value addition in groundnut.
5. Soybean-Origin - geographical distribution and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing-seed viability - seed treatment-seed rate spacing-season-time and method of sowing- varieties -nutrient management- water management

6. Sunflower – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing-seed treatment-seed rate-spacing-season-time and method of sowing- varieties -nutrient management- water management-weed management - yield attributes –yield- harvesting– post harvest operations- quality considerations – seed production-seed setting problems and measures-cropping systems.

UNIT -II (6 Hours)

1. Sesame – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season-time and method of sowing- varieties - nutrient management- water management- weed management yield attributes –yield- Harvesting – post harvest operations- Quality considerations – cropping systems.

2. Rapeseed and mustard – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements-Land preparation - seeds and sowing- seed treatment-seed rate spacing-season-time and method of sowing- varieties.

3. Nutrient management- water management- weed management yield attributes – yield- Harvesting – post harvest operations- quality considerations – cropping systems.

4. Safflower – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties - nutrient management- water management weed management - yield attributes –yield- harvesting – post harvest operations quality considerations – cropping systems.

5. Castor – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties –nipping- nutrient management- water management- weed management - yield attributes –yield- harvesting – post harvest operations- quality considerations – cropping systems.

6. Linseed– Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season pyra /utera, time and method of sowing- varieties – nutrient management- water management- weed management - yield attributes –yield- harvesting – post harvest operations- quality considerations – cropping systems.

7.Niger - Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic

requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties - nutrient management-water management weed management - yield attributes –yield- harvesting – post harvest operations quality considerations – cropping systems. Fibre crops: Cotton, Jute and Mesta

UNIT- III (6 Hours)

1. Cotton- Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- classification- soil - climatic requirements- land preparation - seeds and sowing- seed treatment-seedrate spacing-season-time and method of sowing.

2. Varieties/ Bt cotton - growth stages – branching- nutrient management - water management- weed Management- topping- bud and boll shedding

3. Yield attributes –yield- harvesting-defoliants-mechanized harvesting - quality considerations -cropping systems- climate resilient technologies

4. Jute- Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- - soil - climatic requirements- types of jute- - land preparation - seeds and sowing- seed treatment-seed rate-spacing season-time and method of sowing- varieties - nutrient management - water management- weed management-yield attributes - yield- harvesting – processing of jute- quality considerations- cropping systems.

6. Mesta – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- - soil - climatic requirements types of mesta - land preparation - seeds and sowing- seed treatment-seed rate spacing-season-time and method of sowing- varieties - nutrient management - water management- weed management-yield attributes – yield- harvesting –processing of mesta- quality considerations- cropping systems. Sugar crops- Sugarcane and Sugarbeet

7. Sugarcane – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance - soil - climatic requirements– Influence of rainfall, temperature, light- land preparation – planting time in Coastal and Rayalseema regions of AP

UNIT -IV (6 Hours)

1. Planting material – setts – short crop – nursery crop – different methods of planting – growth stages

2. Nutrient Management – crop logging- trash mulching – wrapping and propping water management- weed management- criteria for judging maturity- climate resilient technologies

3. Ratoon cane management – factors affecting quality of sugarcane – arrowing– jaggery making – clarification.

4. Sugar beet – Origin - geographical distribution - area, production and productivity in India - economic importance- soil - climatic requirements - Land preparation seeds and sowing- seed treatment-seed rate-spacing-season-time and - nutrient management - water management- weed management- yield attributes –yield harvesting - quality considerations- cropping systems
5. Tobacco –Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance - soil - climatic requirements– types of tobacco-Land preparation
6. Nursery management-seeds and sowing for different types- seed treatment-seed rate-spacing-season-time and method of sowing

UNIT – V (6 Hours)

1. Varieties - nutrient management – topping and desuckering-water management weed management- yield attributes –yield- harvesting –priming-curing
2. Quality characters-nicotine content, burning quality, aroma and sugar content methods of curing -flue curing of Virginia tobacco - cropping systems
3. Forage crops- Importance- terminology in forage production-classification of fodders-sorghum and maize importance-seeds and sowing - nutrient requirement irrigation- weed management- harvesting –yield- quality of fodder.
4. Cowpea, cluster bean - napier grass - importance- seeds and sowing -nutrient requirement- irrigation- weed management- harvesting –yield- quality of fodder.
5. Lucerne, berseem, oat – importance- seeds and sowing -nutrient requirement irrigation- weed management- harvesting –yield quality of fodder.
6. Forage crops- Quality considerations- preservation of fodder – hay and silage making Other crops: Potato
7. Potato - Origin - geographical distribution - area, production and productivity in India - economic importance- - soil - climatic requirements – varieties – soil - climatic requirements - land preparation - seeds and sowing- seed treatment-seed rate spacing-season-time and - nutrient management - water management-weed management- yield attributes –yield- harvesting - quality considerations-cropping systems

References text books:

1. Reddy, S.R. and Reddi Ramu. 5th edition, 2016. Agronomy of field crops. Kalyani publishers, Ludhiana.
2. Chidda Singh, Singh, P and Singh, R. 2003. Modern techniques of raising field crops. Oxford & IBH Publishing house, New Delhi.
3. Rajendra Prasad. 2004. Text book of field crops production. Commercial crops, volume-II ,Technical Editor, ICAR, New Delhi.
4. Panda S.C.2014. Agronomy of fodder and forage crops, Kalyani publishers, Ludhian

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

**Course Title: Crop Production Technology–II (Oil Seeds, Fiber,
Sugar, Tobacco And Fodder Crops)**

Course Code: AGRO202

No. of Hrs:30

Credits: 2

Theory

UNIT -1 (6 Hours)

1. Importance of oilseed crops- edible and non – edible oils – nutritional value importance in Indian economy- constraints in oilseed production.
2. Need for improvement of productivity and production of oilseeds -climate resilient technologies- Groundnut – Origin - geographical distribution -area, production and productivity in India and Andhra Pradesh- economic importance
3. Soil and climatic requirements - types - growth stages - land Preparation - seeds and sowing- seed treatment-seed rate-spacing-season-time and method of sowing varieties
4. Water management -weed management- yield attributes –yield- harvesting, postharvest operations- quality considerations -cropping systems – value addition in groundnut.
5. Soybean-Origin - geographical distribution and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing-seed viability - seed treatment-seed rate spacing-season-time and method of sowing- varieties -nutrient management- water management
6. Sunflower – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing-seed treatment-seed rate-spacing-season-time and method of sowing- varieties -nutrient management- water management-weed management - yield attributes –yield- harvesting– post harvest operations- quality considerations – seed production-seed setting problems and measures-cropping systems.

UNIT -II (6 Hours)

1. Sesame – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season-time and method of sowing- varieties - nutrient management- water management- weed management yield attributes –yield- Harvesting – post harvest operations- Quality considerations – cropping systems.
2. Rapeseed and mustard – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and

climatic requirements-Land preparation - seeds and sowing- seed treatment-seed rate spacing-season-time and method of sowing- varieties.

3. Nutrient management- water management- weed management yield attributes – yield- Harvesting – post harvest operations- quality considerations – cropping systems.

4. Safflower – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties - nutrient management- water management weed management - yield attributes –yield-harvesting – post harvest operations quality considerations – cropping systems.

5. Castor – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties –nipping- nutrient management- water management- weed management - yield attributes –yield-harvesting – post harvest operations- quality considerations – cropping systems.

6. Linseed– Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season pyra /utera, time and method of sowing- varieties – nutrient management- water management- weed management - yield attributes –yield-harvesting – post harvest operations- quality considerations – cropping systems.

7.Niger - Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- soil and climatic requirements Land preparation - seeds and sowing- seed treatment-seed rate-spacing-season time and method of sowing- varieties - nutrient management-water management weed management - yield attributes –yield- harvesting – post harvest operations quality considerations – cropping systems. Fibre crops: Cotton, Jute and Mesta

UNIT- III (6 Hours)

1. Cotton- Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- classification- soil - climatic requirements- land preparation - seeds and sowing- seed treatment-seedrate spacing-season-time and method of sowing.

2. Varieties/ Bt cotton - growth stages – branching- nutrient management - water management- weed Management- topping- bud and boll shedding

3. Yield attributes –yield- harvesting-defoliants-mechanized harvesting - quality considerations -cropping systems- climate resilient technologies

4. Jute- Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- - soil - climatic requirements-

types of jute- - land preparation - seeds and sowing- seed treatment-seed rate-spacing season-time and method of sowing- varieties - nutrient management - water management- weed management-yield attributes - yield- harvesting – processing of jute- quality considerations- cropping systems.

6. Mesta – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance- - soil - climatic requirements types of mesta - land preparation - seeds and sowing- seed treatment-seed rate spacing-season-time and method of sowing- varieties - nutrient management - water management- weed management-yield attributes – yield- harvesting –processing of mesta- quality considerations- cropping systems. Sugar crops- Sugarcane and Sugarbeet

7. Sugarcane – Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance - soil - climatic requirements– Influence of rainfall, temperature, light- land preparation – planting time in Coastal and Rayalseema regions of AP

UNIT -IV (6 Hours)

1. Planting material – setts – short crop – nursery crop – different methods of planting – growth stages

2. Nutrient Management – crop logging- trash mulching – wrapping and propping water management- weed management- criteria for judging maturity- climate resilient technologies

3. Ratoon cane management – factors affecting quality of sugarcane – arrowing– jaggery making – clarification.

4. Sugar beet – Origin - geographical distribution - area, production and productivity in India - economic importance- soil - climatic requirements - Land preparation seeds and sowing- seed treatment-seed rate-spacing-season-time and - nutrient management - water management- weed management- yield attributes –yield harvesting - quality considerations- cropping systems

5. Tobacco –Origin - geographical distribution - area, production and productivity in India and Andhra Pradesh - economic importance - soil - climatic requirements– types of tobacco-Land preparation

6. Nursery management-seeds and sowing for different types- seed treatment-seed rate-spacing-season-time and method of sowing

UNIT – V (6 Hours)

1. Varieties - nutrient management – topping and desuckering-water management weed management- yield attributes –yield- harvesting –priming-curing

2. Quality characters-nicotine content, burning quality, aroma and sugar content methods of curing -flue curing of Virginia tobacco - cropping systems

3. Forage crops- Importance- terminology in forage production-classification of fodders-sorghum and maize importance-seeds and sowing - nutrient requirement irrigation- weed management- harvesting –yield- quality of fodder.
4. Cowpea, cluster bean - napier grass - importance- seeds and sowing -nutrient requirement- irrigation- weed management- harvesting –yield- quality of fodder.
5. Lucerne, berseem, oat – importance- seeds and sowing -nutrient requirement irrigation- weed management- harvesting –yield quality of fodder.
6. Forage crops- Quality considerations- preservation of fodder – hay and silage making Other crops: Potato
7. Potato - Origin - geographical distribution - area, production and productivity in India - economic importance- - soil - climatic requirements – varieties – soil - climatic requirements - land preparation - seeds and sowing- seed treatment- seed rate spacing-season-time and - nutrient management - water management- weed management- yield attributes –yield- harvesting - quality considerations- cropping systems

References text books:

1. Reddy, S.R. and Reddi Ramu. 5th edition, 2016. Agronomy of field crops. Kalyani publishers, Ludhiana.
2. Chidra Singh, Singh, P and Singh, R. 2003. Modern techniques of raising field crops. Oxford & IBH Publishing house, New Delhi.
3. Rajendra Prasad. 2004. Text book of field crops production. Commercial crops, volume-II ,Technical Editor, ICAR, New Delhi.
4. Panda S.C.2014. Agronomy of fodder and forage crops, Kalyani publishers, Ludhian

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

Course Title: Production Technology for Ornamental Crops, Medicinal and Aromatic Plants and Landscaping

Course Code: HORT282

No. of Hrs:30

Credits: 2

Theory

UNIT – 1 (6 Hours)

1. Importance and scope of ornamental crops and landscaping - Landscape uses of trees, shrubs and climbers.
2. Principles of landscaping - Initial approach – Axis – Focal Point – Mass effect – Unity – Space – Divisional Lines – Proportion and Scale – Texture – Time and Light – Tone and Colour – Mobility – Rhythm – Balance – Contract – Harmony- Vista – Style.
3. Production technology of cut flowers under protected conditions -Rose – Introduction- origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation – Rootstocks- Stock scion compatibility- Land preparation- planting- Manures and fertilizers- Cultural operations (pruningpinching and mulching) harvesting- Post harvest management- Yield and rose biproducts.
4. Gerbera - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting Manures and fertilizers- Cultural operations - Defoliation- Soil loosening- Shadinguse of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield.

UNIT – II (6 Hours)

1. Carnation - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting Manures and fertilizers- Cultural operations- (Pinching and disbudding) use of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield.
2. Liliumand Orchids - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation Planting- Manures and fertilizers- Cultural operations- Use of growth regulators Physiological disorders- Harvesting- Post harvest management and yield.
3. Production technology of cut flowers under open conditions - Gladiolus and Tuberose- Introduction- Origin and distribution- Classification of varieties- Species and varieties- Climate and soil requirements- Propagation- Land

preparation Planting- Manures and fertilizers- Cultural operations- Use of growth regulators Physiological disorders- Harvesting- Post harvest management and yield.

UNIT – III (6 Hours)

1. Chrysanthemum - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation Planting, Manures and fertilizers- Cultural operations- Pinching and disbudding Use of growth regulators- Harvesting- Post harvest management and yield.

2. Loose flowers - Marigold and Jasmine under open conditions - Introduction- Origin and distribution- Species and varieties- F1 hybrids- Climate and soil requirements Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations- Pinching and disbudding - Use of growth regulators- Harvesting- Post harvest management and yield.

3. Medicinal plants – Scope and Importance – Production technology of Asparagus, Aloe, Costus - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation Intercultural operations - Harvesting - Yield.

UNIT – IV (6 Hours)

1. Periwinkle, Isabgol -Botanical name – Family - Origin - Economic part Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring Irrigation - Intercultural operations - Harvesting - Yield.

2. Aromatic plants – Importance – Essential oil industry in India – Properties of essential oils – Production technology of Mint and Ocimum - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations Harvesting - Yield.

3. Lemongrass, Citronella, Palmarosa - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting - Yield.

UNIT – V (6 Hours)

1. Geranium and Vettiver - Botanical name – Family - Origin - Economic part Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring Irrigation - Intercultural operations - Harvesting - Yield.

2. Processing and value addition in ornamental crops and MAPs produce – Dry flower making - Extraction methods of essential oils.

References text books

1. Bose, T.K. 1999. Floriculture and Landscaping. Naya Prakash, Kolkatta.

2. Bose, T.K. and Yadav, L.P. 1992. Commercial Flowers. Naya Prakash, Kolkatta.
3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi
4. Chattopadhyay, S.K. 2007. Commercial Floriculture. Gene-Tech Books, New Delhi
5. Srivastava, H.C. 2014. Medicinal and Aromatic Plants. ICAR, New Delh

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

Course Title: LIVE-STOCK AND POULTRY MANAGEMENT

Course Code: LSPM201

No. of Hrs:30

Credits: 2

Theory

UNIT – 1 (6 Hours)

1. Demographic distribution of live-stock population.
2. Population dynamics of live-stock and role in Indian economy.
3. Reproduction in live-stock and poultry.
4. Housing systems live-stock and poultry.
5. Design and construction of live-stock and poultry buildings.
6. Selection of site and General principles affecting the design.

UNIT – II (6 Hours)

1. Arrangements of building.
2. Building materials
3. Indian breeds of cattle, buffalo, sheep, goat, swine and poultry
4. exotic breeds of cattle, buffalo, sheep, goat, swine and poultry
5. Management of calves, growing heifers and milch animals
6. Management of sheep, goat and swine
7. Incubation, hatching and brooding

UNIT – III (6 Hours)

1. Improvement of live-stock and poultry.
2. Digestion and metabolism live-stock and poultry.
3. Classification of feedstuffs for live-stock and poultry.
4. Proximate principles of feed.
5. Nutrients and their functions.
6. Feed ingredients for ration- Balanced ration.
7. General principles of computation of ration.

UNIT – IV (6 Hours)

- 1 Formulation of rations and feeding dairy cattle and buffaloes.
- 2 Formulation of rations sheep, goat and swine and poultry.
- 3 Feed supplements Feed additives in the rations of live-stock and poultry.
- 4 Feeding of live-stock and poultry.
- 5 Diseases of cattle and buffaloes.
- 6 Diseases of sheep, goat and swine.

UNIT – V (6 Hours)

1. Diseases of Poultry.
2. Sanitation – Sanitation of live-stock and poultry houses.
3. Prevention of infectious diseases in live-stock and poultry.
4. Vaccination schedule for cattle and buffaloes sheep, goat.
5. Vaccination schedule for swine and poultry.
6. Control of infectious diseases in live-stock and poultry.

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

Course Title: Rural Development Planning and Management

Course Code: PMRD 202

No. of Hrs:30

Credits: 2

Unit I (6 Hrs.)

Types of Planning Process

Unit II (6 Hrs.)

Decentralization of Planning

Unit III (6 Hrs.)

Micro Level Planning (Village Level Planning)

Unit IV (6 Hrs.)

Block and District Level Planning- Strategies for Sustainable Development

Unit V (6 Hrs.)

District Planning

SYLLABUS

Subject: Agriculture and Rural Development

Semester: IV

Course Title: STATISTICAL METHOD

Course Code: SMCA201

No. of Hrs:15

Credits: 1

Theory

UNIT – 1 (3Hours)

1. Introduction and various definitions of Statistics - Singular and plural reference of Statistics - A comprehensive definition of Statistics - Importance of Statistics in agriculture - limitations of statistics.

2. Frequency Distribution- Exclusive and inclusive methods - Discrete and continuous variables - Graphical representation of data

3. Central tendency -Definition - Measures of Central tendency - List of all the different measures and study of Arithmetic Mean – Median - Mode in detail (including merits and demerits) for ungrouped and grouped data.

4. Measures of Dispersion – Meaning of measures of Dispersion - Standard Deviation for ungrouped and grouped data- Coefficient of Variation (C.V) - Standard Error (S.E.) and difference between S.D. and S.E.

UNIT - II (3 Hours)

1. Definition of Probability – Addition - Multiplication theorems - Binomial and Poisson distributions

2. Normal Curve and its properties - Identification of normality through data i.e., criterion. etc., expression for frequency function of Normal distribution

3. Testing of Hypothesis – Concept - Null hypothesis - Type I and Type II Errors Level of Significance - Critical region - General setup of testing - Large Sample Test with known and unknown

UNIT – III (3 Hours)

1. Small Sample test (t-test for one and two samples and Paired t- test) and F-test

2. Chi-Square test for 2x 2 and m x n contingency Table - Yate's correction for Continuity

3. Correlation – Scatter diagram - Positive and negative correlation and its testing

UNIT – IV (3 Hours)

1. Regression – Fitting of linear regression equation of Y on X and X on Y and the inter relation-ship with “r” and testing of regression coefficients

2. Analysis of Variance (ANOVA) - Definition and assumptions - ANOVA with One-way classification (CRD) layout and analysis with equal and unequal repetitions, Advantages and disadvantages
3. ANOVA with Two-way Classification (RBD) - Layout and analysis, Advantages and disadvantages

UNIT - V (3 Hours)

1. ANOVA with three-way classification (LSD) – Layout and Analysis - Advantages and disadvantages.
2. Introduction to Sampling - Sampling Vs Census - Purposive and Random Sampling
3. Simple Random Sampling - Method of selection - Estimates of population mean and total and the estimates of their variances and confidence limits.

References text books

1. Nageswara Rao, G 2007. Statistics for Agricultural Sciences. B S Publications, Hyderabad
2. Rangaswamy, R 1995. A Text Book of Agricultural Statistics. New Age International (P) Limited, Hyderabad.
3. Chandel SRS, Hand Book of Agricultural Statistics. Achal Prakashan Mandir publications, New Delhi.
4. Agrawal, B.L. Programmed Statistics. 2nd Edition, New Age International Publishers

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

Course Title: Manures, fertilizers and soil fertility management

Course Code: SSAC221

No. of Hrs: 30

Credits: 2

THEORY

UNIT- 1 (6 Hours)

1. Introduction - History of soil fertility and plant nutrition - Concepts of soil fertility, soil productivity, Navadhanya and Annapurna concepts in relation to soil fertility Soil as a source of plant nutrients - Nutrient Elements - Arnon's criteria of essentiality – Essential, functional and beneficial elements.
2. Scientists responsible for the essentiality of nutrients -Ionic forms of plant nutrients in soil – Mechanism of nutrient transport - Movement of ions from soils to roots – Mass flow, diffusion, root interception and contact exchange.

3. Essential nutrients – Classification and their functions in plants.

4. Deficiency symptoms of nutrients - Corrective measures – Toxicity symptoms of different nutrients.

5. Nitrogen - Occurrence, content and distribution - Factors influencing the content of nitrogen in soil. Forms of soil nitrogen - Nitrogen Cycle – Transformations in soils – Mineralization (amination and ammonification) - Fate of released ammonia – Factors affecting ammonium fixation - Nitrification – Factors affecting nitrification – Fate of released nitrate nitrogen.

6. Leaching losses of nitrate nitrogen – Nitrification inhibitors-Denitrification – Immobilization, Nitrogen fixation - Different types – Biological fixation of nitrogen – Symbiotic and non symbiotic – Nitrogen balance sheet – Gains and losses.

UNIT -II (6 Hours)

1 Phosphorus - P – Cycle – Content in soils – Forms of phosphorus in soil - Inorganic and organic phosphorus compounds – Phosphorus fixation – Mechanisms of phosphate fixation - Factors affecting phosphate fixation in soil - Quantity and intensity parameters.

2. Potassium - Content in soil – Source – Forms of soil potassium - Potassium fixation Factors affecting potassium fixation – Quantity and Intensity parameters – Luxury consumption.

3. Calcium - Sources and content – Forms of calcium in soil, factors affecting the availability of calcium in soil – Magnesium - Sources – Content – Forms of magnesium in soils - Factors affecting availability of magnesium - Functions.

4. Sulphur - S – Cycle – Occurrence – Forms of Sulphur in soil - Sulphur transformation in soils – Mineralization and immobilization - Sulphur Oxidation – Factors affecting oxidation in soils - Sulphide injury – Causes, symptoms and remedial measures.

5. Micronutrient - Sources – Forms in soil solution – Pools of micronutrients – Predisposing factors for occurrence of micronutrient deficiencies in soil and plants

6. Zn and Mn - Content – Forms in soils – Critical limits in soils and plants - Factors affecting their availability.

7. Fe and Cu - Content – Forms in soils – Critical limits in soils and plants. Factors affecting their availability.

UNIT- III (6 Hours)

1. Boron and Molybdenum - Content – Forms in soil - Critical limits in soils and plants. Factors affecting their availability.

2. Chlorine - Content – Forms in soils – Critical limits in soils and plants. Factors affecting its availability – Beneficial Elements- Sodium, Cobalt, Vanadium and Silicon

3. Soil fertility Evaluation: - Approaches – Soil testing – Objectives of soil testing – Chemical methods for estimating available nutrients. 4. Plant analysis – Rapid tissue tests – Indicator plants - Biological methods of soil fertility evaluation, A- value – Microbiological methods – Sackett and Stewart techniques – Mehlich technique – Cunninghamella plaque method – Mulder's *Aspergillus niger* technique – Mistcherlich's pot culture method.
5. Soil test-based fertilizers recommendation: - Critical nutrient concept (Cate and Nelson) – Critical levels of nutrients in soils - General recommendations Use of empirical equations for scheduling fertilizer doses - Targeted yield approach
6. Nutrient use efficiency: - Soil, plant and management factors influencing Nutrient use efficiency in respect of N, P, K, S, Fe and Zn fertilizers – Foliar application – Fertigation – Liquid fertilizers.
7. Methods of application of nutrients under rainfed and irrigated conditions

UNIT – IV (6 Hours)

1. Introduction and importance of organic manures - Definition and difference between manures and fertilizers-Classification of manures (Bulky & Concentrated) with suitable examples. Importance of manures in soil fertility management.
2. Bulky organic manures – Preparation of FYM – Methods of collection and storage. Losses of nutrients from FYM during collection and storage -Ways to minimize these losses.
3. Compost and composting – Different methods of composting including the starters and raw materials
4. Methods of preparation of rural and urban compost. Mechanical compost plants – Their advantages over conventional composting –Vermi-composting
5. Green manures – Classification with examples. Advantages and limitations of green manuring and green leaf manuring. Biogas plant – Principles of operation and its advantages.
6. Definitions of penning, sewage, sewerage, sullage, poudrette, Activated compost process. Concentrated organic manures – Oil cakes, blood meal, bone meal, horn meal, fish meal, meat meal and guano.

UNIT – V (6 Hours)

1. Chemical fertilizers – Classification with examples – Nitrogenous fertilizers – composition and properties of major nitrogenous fertilizers viz., Ammonium sulphate, urea and calcium ammonium nitrate.
2. Phosphatic fertilizers – Composition of Rock phosphate – Occurrence, types and properties- properties of SSP, TSP and basic slag – Potassic fertilizers – MOP, SOP properties.

3. Secondary and micronutrient fertilizers – Different sources of these nutrients and their contents - Conditions leading to their deficiency - Methods of application and mode of action of NPK fertilizers in soils.
4. Amendments – Role of important organic and inorganic amendments and synthetic conditioners as amendments - Complex fertilizers – Types, composition of DAP, MAP, UAP, important nitrophosphates.
5. Mixed fertilizers – Advantages and disadvantages over straight fertilizers - Nanofertilizers- Fertilizer grade – Fertilizer ratio – unit value of fertilizers – Problems - INM - Components - Advantages.
6. Fertilizer Control Order (FCO) – Its importance and regulations - Specifications for important fertilizers - Fertilizer storage – Specifications - Problems during storage.

References text book

1. Indian Society of Soil Science.2012. Fundamentals of Soil Science. IARI, New Delhi.
2. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilisers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillian Publishing Co., New York.
4. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV
Course Title: Agricultural Marketing, Trade and Prices-Practical
Course Code: AECO242P
No. of Hrs:30 Credits:1

EXPERIMENTS

1. Plotting and study of demand and supply curves for major agricultural commodities.
2. Calculation of elasticities for important agricultural commodities.
3. Study of relationship between market arrivals and prices of some selected commodities.
4. Computation of marketable and marketed surplus of important commodities.

5. Study of price behaviour over time for some selected commodities.
6. Estimation and calculation of marketing costs, margins and price spread and presentation of report in the class.
7. Visit to SWC/CWC to study their objectives, role, organization, functioning and performance.
8. Visit to FCI and study its objectives, role, organization and functioning and performance

SYLLABUS

Subject: Agriculture and Rural Developments Semester: IV

Course Title: Renewable Energy and Green Technology-Practical

Course Code: AENG252P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Availability and uses of non - conventional energy in agricultural sector.
2. Bio-fuel production from biomass and its application.
3. Practical approach to biogas production and biogas plants capacity and design calculations.
4. Evaluation of solar pump for agriculture.
5. Study of solar drying system.
6. Study of solar distillation and solar pond.
7. Steps adopted for erecting solar fence.
8. Visit to solar wind farm. 15&16. Visit to solar photovoltaic farm.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: IV

**Course Title: Entrepreneurship Development and Business
Communication-Practical**

Course Code: AEXT292P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Field visits to study any one Agri - based industries/ business – Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis.
2. Field visits to study the constraints in setting up of agro based industries Formulation of project feasibility reports and industrial and agri-business houses.
3. Field visits to study the formulation of project feasibility reports.
4. Field visits to study the industrial and agri-business houses.
5. Field visits to study the characteristics of successful entrepreneurs.
6. Field visits to study the any one of the Local Financial Institutions to study the MSME Policies.
7. Field visits to study the Entrepreneurial Development Institute to study the Process of Entrepreneurship Development.
8. Field visits to the local Public - Private Enterprises to study the managerial skills and achievement motivation.

SYLLABUS

Subject: Agriculture and Rural Development Semester: IV

**Course Title: Irrigation water management, farming systems and
sustainable Agriculture-PRACTICAL**

Course Code: AGRO203P

No. of Hrs: 30

Credits:1

EXPERIMENTS

1. Determination of bulk density
2. Determination of soil moisture content by gravimetric and volumetric method
3. Determination of infiltration rate
4. Determination of field capacity by field method
5. Measurement of irrigation water through flumes, weirs and V notches
6. Scheduling of irrigation by IW / CPE ratio method
7. Calculation of irrigation water requirements

8. Lay out of surface irrigation methods
9. Visit to micro irrigation systems in farmer fields.
10. Water management practices in rice, wheat and maize.
11. Water management practices in groundnut, sunflower and sugarcane.

SYLLABUS

Subject: Agriculture and Rural Development **Semester: IV**

Course Title: Crop Production Technology–II -Practical

Course Code: AGRO202P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Land preparation and layout of plots
2. Sowing methods of sugarcane
3. Sowing of oil seeds, fiber, sugar crops and fodder crops
4. Identification of plant characteristics of oil seeds, fiber, sugar crops and fodder crops
5. Yield and juice quality analysis of sugarcane
6. Visit to research stations of related crops
7. Collection of post-harvest data on the crop

Agronomy Tour

1. Visit to agronomic experiments of Oil seeds, fiber, sugar crops and fodder crops at experimental farms.
2. Visit to nearby farmers' fields

SYLLABUS

Subject: Agriculture and Rural Development **Semester: IV**

**Course Title: Production Technology For Ornamental Crops,
Medicinal and Aromatic Plants and Landscaping-
Practical**

Course Code: HORT282P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Identification of ornamental plants.
2. Identification of Medicinal and Aromatic Plants.
3. Nursery bed preparation and flower seed sowing.
4. Training and pruning of roses.
5. Bed preparation and planting of Medicinal and Aromatic Plants.
6. Harvesting and postharvest handling of cut and loose flowers.
7. Floral preservatives to prolong vase-life of cut flowers.
8. Visit to commercial flower unit.
9. Visit to commercial MAP unit.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: IV

Course Title: Live-Stock and Poultry Management-Practical

Course Code: LCPM201P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Familiarizing with body points/parts of different domesticated animals and poultry.
2. Approaching, handling methods of restraining.
3. Casting of live-stock.
4. Identification methods of farm animals and poultry (branding, tattooing, notching & tagging).
5. A visit to the live-stock and poultry farms.
6. Identification of various breeds and familiarizing with various farm routines and farm records.
7. Hatching equipment Hatchery operations and incubation.
8. Management of chicks, growers and layers.
9. Debeaking, dusting and vaccination.
10. Economics of cattle, buffalo, sheep, goat, swine and poultry production

SYLLABUS

Subject: Agriculture and Rural Development

Semester: IV

Course Title: Statistical Method-Practical

Course Code: SMCA201P

No. of Hrs:30

Credits:1

EXPERIMENTS

1. Preparing frequency distribution for ungrouped data by using inclusive and exclusive methods and calculation of quartile - Deciles and Percentiles.
2. Preparing various graphs and charts.
3. Computation of A.M, Median and Mode for grouped and un-grouped data by direct and deviation methods.
4. Problems on calculating skewness and kurtosis - S.D and CV% for grouped data
5. Problems on probability.
6. Problems on binomial and poisson distributions.
7. Normal curve and its properties, identification of normality through data i.e., criterion. etc., - Expression for frequency function of normal distribution.
8. Problems on Z- test for one Sample - Two sample with known and unknown conditions of.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: IV

Course Title: Manures, fertilizers and soil fertility management-Practical

Course Code: SSAC221P

No. of Hrs: 30

Credits:1

EXPERIMENTS

1. Introduction to analytical instruments and principles-spectrometry and flame photometry
2. Estimation of available N in soils

3. Estimation of K & S in plant samples
4. Identification acid radicals in fertilizers /salts
5. Identification of basic radicals in fertilizer /salt
6. Estimation of N in Ammonium sulphate
7. Estimation of N in Urea and FYM
8. Estimation of water soluble P₂O₅ in SSP
9. Estimation of K in Muriate of potash or Sulphate of potash by using Flame photo meter

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Protected Cultivation and Post-harvest technologies

Course Code: AENG351

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(3 Hrs.)

1. Introduction to greenhouses - History, definition, greenhouse effect, advantages of green houses.
2. Brief description of types of greenhouses - Greenhouses based on shape, utility, construction, covering materials and cost, shade nets.
3. Plant response to greenhouse environments - Light, temperature, relative humidity, ventilation and carbon dioxide and environmental requirement of agriculture and horticulture crops inside green houses.
4. Equipment required for controlling greenhouse environment – Summer cooling and winter cooling, natural ventilation, forced ventilation and computers.

UNIT-II

(3 Hrs.)

1. Planning of green house facility - Site selection and orientation, structural design and covering materials.
2. Materials for construction of greenhouses - Wood, galvanized iron, glass, polyethylene film, poly vinyl chloride film, Tefzel T2 film, fiberglass reinforced plastic rigid panel and acrylic and polycarbonate rigid panel.

3. Design criteria and constructional details of greenhouses - Construction of pipe framed greenhouses, material requirement, preparation of materials and procedure of erection.

UNIT-III

(3 Hrs.)

1. Greenhouse heating and distribution systems - Greenhouse utilization - Off-season drying of agricultural produce - Economic analysis of greenhouse production - Capital requirement, economics of production and conditions influencing returns.
2. Irrigation system used in greenhouses - Rules of watering, hand watering, perimeter watering, overhead sprinklers, boom watering and drip irrigation.
3. Important engineering properties such as physical, thermal and aero-dynamic properties of cereals, pulses and oil-seeds.

UNIT-IV

(3 Hrs.)

1. Designing postharvest equipment based on physical and thermal properties.
2. Winnowing - Manual and power operated winnowers, care and maintenance - Groundnut decorticators - Hand and power operated decorticators, principle of working, care and maintenance.
3. Moisture measurement - Equilibrium moisture content (EMC) – importance - Drying theory - Drying and dehydration.

UNIT-V

(3 Hrs.)

1. Commercial grain dryers - Deep bed, flat bed, tray, fluidised bed, recirculated and solar dryers.
2. Material handling equipment - Bucket elevator and screw conveyer and their selection.
3. Primary processing of cereals, pulses and oilseeds - Cleaning, grading and packaging.

References

1. Radha Manohar, K and Igathinathane. C. Greenhouse Technology and Management, 2nd Edition, BS Publications.
2. Tiwari, G.N. Greenhouse Technology for Controlled Environment. Narosa Publishing house Pvt.Ltd. 3. Singh Brahma and Balraj Singh., 2014. Advances in Protected Cultivation, New India Publishing Company.
3. Sahay, K.M. and Singh, K.K. 1994. Unit operations of Agricultural Processing. Vikas Publishing house Pvt. Ltd. New Delhi.
4. Chakraverty, A. Post-Harvest Technology of cereals, pulses and oilseeds. Oxford & IBH publishing Co. Ltd., New Delhi.
5. Ojha, T.P and Michael, A.M. Principles of Agricultural Engineering, Vol. I, Jain Brothers, Karol Bag, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

**Course Title: Geo informatics & Nanotechnology for Precision Farming &
Practical Crop Production**

Course Code: AGRO301

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

1. AGRO Precision agriculture: concepts and techniques-Issues and concerns for Indian agriculture.
2. AGRO Principles and practices of precision agriculture.
3. AGRO Geo-informatics- definition, concepts, tools and techniques and their use in Precision Agriculture.
4. AGRO Crop discrimination and Yield monitoring techniques.

UNIT-II

(6 Hrs.)

1. AGRO Global positioning system (GPS) –Components and its application in agriculture.
2. AGRO Geodesy and its basic principles.
3. AGRO Spatial data and their management in GIS.

UNIT-III

(6 Hrs.)

1. AGRO Application of nanotechnology in agriculture - tillage, seed, water, fertilizers, plant protection for scaling-up farm productivity.

2. SSAC Cartography, units of cartography, map scale, various symbols used in cartography, Soil mapping techniques.
3. SSAC Remote sensing- concepts, Spectral reflectance of various earth features, atmospheric windows.

UNIT-IV

(6 Hrs.)

1. SSAC Image processing and interpretation - geo referencing - supervised and unsupervised classification of RS images. STCR approach for precision agriculture - principles and computations.
2. SSAC Applications of remote sensing techniques in the field of agriculture and allied sciences including drones.
3. SSAC Spatial variability of soil fertility, its determination, fertilize recommendation using geospatial technologies in precision farming.

UNIT-V

(6 Hrs.)

1. SSAC Nanotechnology, definition, concepts and techniques – Nano scale – definition – Nano-particles, materials - occurrence – properties.
2. SSAC Characterization of nano-materials - structural characterization - Nano-sensors.
3. SSAC Nano-fertilizers, nano-pesticides - importance and advantages – synthesis– strategies.

References

1. Pradeep. T. 2007. NANO: The Essentials: Understanding Nanoscience and Nanotechnology. Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Lillesand, T.M. and Kiefer, R. W. 1994. Remote sensing and image interpretation. (3rd edition), John Wiley and Sons.
3. Anji Reddy, M. 2006. Text book of Remote sensing and Geographical Information Systems, (3rd edition), B.S. Publications, Hyderabad.

SYLLABUS

Subject: Agriculture and Rural Developments
Course Title: Principles of Food Science and Nutrition
No. of Hours: 30 Hrs.

Semester: V
Course Code: BICM300
Credits: 2

UNIT-I

(6

Hrs.)

1. Concepts of food science - Definitions of food, specific nutrients in foods and their functions - Physical characteristics of foods – Importance,

2. Food physical characteristics - Density - Phase change, pH, osmosis, surface tension, colloidal systems.
3. Food composition - Food chemistry - Water, solutions, water balances in body, clinical signs of water depletion, excessive water intake, recommended requirements,
4. Carbohydrates - Structure, properties of sugars, starches, cellulose and hemicelluloses, pectin, gums.
5. Proteins - Structure, amino-acids, properties.
6. Fats and oils - Structure, functional aspects.
7. Vitamins - Retinol, vitamin D, vitamin E, vitamin K, ascorbic acid, B-complex group,

UNIT-II (6 Hrs.)

1. Minerals, pigments, colours, flavours
2. Natural emulsifiers.
3. Organic acids.
4. Oxidants and antioxidants.
5. Enzymes.
6. Food microbiology - Morphology and fine structure of bacteria - Cultivation of bacteria, nutritional requirements -Nutritional classification of bacteria.

UNIT-III (6 Hrs.)

1. Introduction to yeast, algae and protozoa and virus, general characteristics.
2. Microbial spoilage of foods - Factors affecting kinds, numbers, growth and survival of microorganisms in foods.
3. Production of fermented foods - Production, purification and estimation of beer/ ethanol.
4. Preservation by heat treatment - Principle and equipment for blanching.
5. Preservation by heat treatment - Canning, pasteurization, sterilization.

UNIT-IV (6 Hrs.)

1. Preservation by use of low temperature - Principle, methods, equipment.
2. Preservation by chemicals - Antioxidants, mould inhibitors, antibodies, acidulants, etc.
3. Preservation by irradiation - Principle, methods, equipment.
4. Preservation by fermentation - Principles, methods, equipment.

5. Preservation by drying, dehydration and concentration - Principle, methods, equipment.
6. Food and nutrition - History of diet around the world - European diet.
7. Malnutrition (over and under nutrition), body cell, digestion and absorption, energy and calories, obesity and weight control.

UNIT-V
Hrs.)

(6

1. Nutritional disorders that can compromise health.
2. Energy metabolism - Carbohydrates, individual sugars, sugars and diabetes mellitus, glycemic response, dietary carbohydrates.
3. Energy metabolism - Fat, synthesis, control, biosynthesis, cellular degradation, peroxidation.
4. Energy metabolism - Proteins, synthesis, catabolism, ammonia and urea.
5. Balanced/modified diets, diet selection.
6. Menu planning.
7. New trends in food science and nutrition.

References

1. Sumati R. Mudambi, Shalini M. Rao and M.V. Rajagopal. 2006. Food Science, 2nd Ed. New Age International (P) Limited, New Delhi.
2. Martin Eastwood. 2003. Principles of Human Nutrition. Blackwell Science Ltd., Oxford.
3. Norman N. Potter. 1998. Food Science, 5th Ed. Springer Science+ Business Media, New York.
4. Michael J. Pelczar Jr., E.C.S. Chan and Noel R. Krieg. 1998. Microbiology, 5th Ed. Tata McGraw-Hill Education, New Delhi.
5. William C. Frazier and & Dennis C. Westhoff. 1987. Food Microbiology, 4th Ed. Tata McGraw-Hill Education, New Delhi.
6. L.E. Casida Jr. 1968. Industrial Microbiology. New Age International Publishers, New Delhi.
7. P. Fellows. 2000. Food Processing Technology: Principles and Practice, 2nd Ed. CRC Press, Boca Raton, FL, USA.
8. Marcus Karel and Darvl B. Lund.2003. Physical Principles of Food Preservation, 2nd Ed. Marcel Dekker, Inc., NY, USA.
9. Gerald Wiseman. 2002. Nutrition and Health. Taylor & Francis, London.
10. An Introduction to Nutrition, v. 1.0

SYLLABUS

Course Title: Environmental Studies & Disaster Management

Course Code: CPHY361

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(6 Hrs.)

1. Environmental studies - Definition – Scope and importance, need for public awareness, people and institutions in environment.
2. Natural resources – Renewable and non-renewable resources – Forest resources – Functions of forests – Causes and consequences of deforestation.
3. Water resources – Sources, uses and over utilization of surface and groundwater - Dams – Benefits and problems – Sustainable management of water.
4. Food resources – Food sources, world food problems and food security.

UNIT-II

(6 Hrs.)

1. Energy resources – Renewable and non-renewable energy sources and their impact on environment.
2. Land resources – Land degradation, desertification and land use planning – Role of an individual in conservation of natural resources.
3. Biodiversity – Definition – Types of biodiversity – Bio-geographical classification in India – Methods of measuring biodiversity – Biodiversity Act – Functions of National Biodiversity Board.

UNIT-III

(6 Hrs.)

1. Threats to biodiversity – Habitat loss – Poaching of wild life – Man-wild life conflicts – Conservation of biodiversity – In situ and ex situ.
2. Environmental pollution – Causes, effects and control measures of air and water pollution – Tolerable limits for toxic gases in air.
3. Causes, effects and control measures of soil pollution – Bioremediation – Tolerable limits for heavy metals in soil.

UNIT-IV

(6 Hrs.)

1. Causes, effects and control measures of thermal, marine and noise pollution, nuclear hazards.
2. Solid waste management – Need of waste management – Types of solid waste – Management processing technologies.
3. Disaster management - Natural Disasters – Meaning and nature of natural disasters, types and effects - Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, heat and cold waves - Manmade disasters – Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, road accidents, rail accidents, air accidents, sea accidents. – International strategy for disaster reduction - Concept of disaster management - National disaster management framework

- Financial arrangements - Role of NGOs, community-based organizations and media, Central, state, district and local administration, Armed forces, police and other organizations in disaster response.

UNIT-V (6 Hrs.)

1. Social issues and the environment – Unsustainable to sustainable development – The Environment Protection Act – The air (prevention and control of pollution) act - The water (prevention and control of pollution) act – The wildlife protection act - Forest conservation act.
2. Woman and child welfare – Human immuno-deficiency virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS) – Role of information technology on environment and human health.

Prescribed Text Book

1. Bharucha, E. 2005. Text book of Environmental Studies for undergraduate courses. University Grants Commission, New Delhi.

Reference

1. Anjaneyalu, Y. 2004. Introduction to Environmental Science. BS Publications, Hyderabad, A.P. India.

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Pests of Field crops and Stored Grain and their Management

Course Code: ENTO331

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

1. General account on nature and type of damage by different arthropod pests. Scientific name, order, family, host range, distribution, marks of identification, bionomics, nature of damage, and management of major, minor insect pests and other important arthropod pests of various field crops.
2. Introduction of Economic Entomology and Economic Classification of Insect Pests
3. Rice-Yellow stem borer and other borers, gall midge, brown - plant hopper, green leafhopper, hispa, leaf folder, ear head bug, grasshoppers, root weevil, swarming caterpillar, climbing cutworm, case worm, whorl maggot, leaf mite and panicle mite-IPM practices.

UNIT-II

(6 Hrs.)

1. Sorghum and other millets- Sorghum shoot fly, stem borer, pink borer, sorghum midge, ear head bug, red hairy caterpillar, deccan wingless grasshopper, aphids, maize shoot bug, flea beetle, blister beetles, ragi cutworm, ragi root aphid and army worm- IPM practices. Wheat- Ghujia weevil, ragi pink borer and termites- IPM practices.
2. Sugarcane- Early shoot borer, internode borer, top shoot borer, scales, leafhoppers, white grub, mealybugs, termites, whiteflies, woolly aphid and yellow mite- IPM Practices.

UNIT-III

(6 Hrs.)

1. Cotton- Spotted bollworm, American bollworm, pink bollworm, tobacco caterpillar, leafhopper, whiteflies, aphid, mites, thrips, red cotton bug, dusky cotton bug, leaf roller, stem weevil, grasshoppers, and mealybug - IPM Practices.
2. Jute- Semilooper, stem weevil, stem girdler and Bihar hairy caterpillar. Mesta- Hairy caterpillars, stem weevil, mealybugs, leafhopper and aphid. Sunhemp- Hairy caterpillars, stem borer and flea beetle. IPM Practices.
3. Pulses- Gram caterpillar, plume moth, pod fly, stem fly, spotted pod borer, cowpea aphid, cowbug, pod bug, leafhopper, stink bug, green pod boring caterpillar, blue butterflies, leaf webber/borer and redgram mite. Soyabean- Stem fly, stem girdler, ragi cutworm, leaf miner and whitefly- IPM Practices. Pea- pea leaf miner and pea stem fly.

UNIT-IV

(6 Hrs.)

1. Castor-Semilooper, shoot and capsule borer, tobacco caterpillar, leafhopper, butterfly, whitefly, thrips, castor slug and mite- IPM Practices. Groundnut - White grub, leaf miner, red hairy caterpillar, tobacco caterpillar, leafhopper, thrips, aphid, pod bug, bud borer, wire worms and jewel beetle- IPM Practices.
2. Sesamum-Leaf and pod borer, gall fly and sphinx caterpillar. Safflower- Aphids and leaf eating caterpillars- IPM Practices.
3. Mustard- Aphid, sawfly, diamondback moth and painted bug. Sunflower- Helicoverpa and Spodoptera, leafhopper, Bihar hairy caterpillar and thrips - IPM Practices.
4. Stored grains Pests- Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain.
5. Stored grain Insect pests - Rice weevil, lesser grain borer, khapra beetle, pulse beetle, groundnut bruchid, flour beetles, saw-toothed beetle, cigarette beetle, angoumois grain moth and rice moth.

UNIT-V

(6 Hrs.)

1. Stored grains - Non insect Pests- Mites, rodents, birds and microorganisms associated with stored grain - Storage structures and methods of grain storage and fundamental principles of grain store management.
2. Locusts- Locusts and their management, Mites- Economically important phytophagous mites of field crops and their management.
3. Nematodes-White tip nematode of rice, cyst and gall nematode of wheat, and their management.
4. Rodents- Rodents damaging field crops and stored grains - Keys for identification of rodents and their management.
5. Birds- Various birds infesting crops and their management.

References

1. Vasantharaj David, B. and Rama Murthy V.V. 2016. Elements of Economic Entomology, Popular Book Depot, Coimbatore
2. Vasantharaj David, B and Aanathkrishnan, T.N. 2006. General and Applied Entomology. Tata McGraw-Hill Publishing House, New Delhi.
3. Nair MRGK. 1986. Insects and Mites of crops in India. Indian Council of Agricultural Research New Delhi.
4. Ramakrishna Ayyar, T.V. 1963. Handbook of Economic Entomology for South India. Government Press, Madras.

5. Dennis S Hill 1987 Agricultural Insect Pests of tropics and their control, Cambridge Universtiy Press, New York
6. Upadhyaya K.P. and Kusum Dwivedi. 1996. A Text Book of Plant Nematology. Aman Publishing House, Meerut.
7. Khare, S.P. 1993. Stored Grain Pests and their Management. Kalyani Publishers, Ludhiana.
8. Atwal, A.S. 1976. Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Crop Improvement - I (*Cereals, Millets, Pulses and Oilseeds*) and Intellectual Property Rights

Course Code: GPBR311

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

1. Introduction – General Breeding Objectives – Concepts of breeding self-pollinated, cross pollinated and vegetatively propagated crops - Breeding populations relevance in crop improvement.
2. Cereals - Rice - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids-Accomplishments.
3. Cereals - Wheat and Barley - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
4. Millets - Sorghum and Pearl millet - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.

UNIT-II

(6 Hrs.)

1. Millets - Finger millet, Kodo millet and Proso millet - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids-Accomplishments.
2. Pulses - Chickpea - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids-Accomplishments.
3. Pulses - Pigeonpea - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and

modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.

UNIT-III

(6 Hrs.)

1. Pulses - Urd bean and Mung bean - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
2. Pulses - Soybean and Cowpea - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
3. Pulses - Horsegram, Fieldpea and Lentil - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties-seed production technology of varieties and hybrids – Accomplishments.

UNIT-IV

(6 Hrs.)

1. Oilseeds - Groundnut- Origin – Distribution of species – Wild relatives and forms – breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids-Accomplishments.
2. Oilseeds - Castor and Sesame - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
3. Oilseeds - Sunflower and Safflower - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.

UNIT-V

(6 Hrs.)

1. Oilseeds - Rapeseed and Mustard - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
2. Oilseeds - Linseed and Niger - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
3. Oilseeds - Coconut and Oilpalm - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids

/ varieties - Seed production technology of varieties and hybrids – Accomplishments.

References

1. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
2. Phundan Singh. 2006. Essential of Plant Breeding. Kalyani Publishers, Ludhiana.
3. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. Principles and Practices of Plant Breeding. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kalloo, G.1994. Vegetable Breeding. Panima Educational Book Agency, New Delhi.
6. Kumar, N.2006. Breeding of Horticultural Crops-Principles and Practices. New India Publishing Agency, New Delhi.
7. George Acquaah. 2012. Principles of Plant Genetics and Breeding. Blackwell Publishing Ltd., USA.
8. Mono graphs available on specific crops.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

**Course Title: Diseases of Field and Horticultural Crops and their Management - I
(Field Crops)**

Course Code: PATH371

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

Study of etiology, symptoms, host-parasite relationship and specific management practices of the following diseases.

1. Rice diseases – blast, brown spot.
2. Rice diseases – Sheath rot, Stem rot, narrow brown leaf spot.
3. Rice diseases – sheath blight, False smut, Bacterial leaf blight.
4. Rice diseases – Bacterial leaf streak, Rice Tungro Disease, Khaira.
5. Wheat diseases – Black or stem rust, orange rust, yellow rust.

6. Wheat diseases - loose smut, Karnal bunt.
7. Wheat diseases – Powdery mildew, alternaria blight, Tundu disease.

UNIT-II

(6 Hrs.)

1. Sorghum diseases – Anthracnose, rust, ergot, headmold, leaf blight.
2. Sorghum diseases - smuts, charcoal rot, downy mildew, Striga.
3. Maize diseases - Turcicum leaf blight, post flowering stalk rots, charcoal rot.
4. Maize diseases - Banded leaf and sheath blight, downy mildew.
5. Bajra diseases – Downy mildew/green ear, rust, ergot, smut.

UNIT-III

(6 Hrs.)

1. Ragi/Fingermillet diseases- blast, smut, mosaic.
2. Cotton diseases– Bacterial blight, Fusarium wilt, Verticillium wilt, root rot.
3. Cotton diseases – grey mildew, anthracnose, Alternaria leaf spot, Cercospora leaf spot, Helminthosporium leaf spot, rust.
4. Sugarcane diseases – red rot, whip smut, wilt, ring spot.
5. Sugarcane diseases – Grassy shoot, mosaic, ratoon stunting, rust, Pokah Boeng.
6. Tobacco diseases –black shank, Damping off, Frog eye spot, brown spot, black root rot.

UNIT-IV

(6 Hrs.)

1. Tobacco diseases – Mosaic, leaf curl, Orobanche.
2. Groundnut diseases – Collar rot, Tikka leaf spots, rust, pepper leaf spot, stem rot.
3. Groundnut diseases – Bud necrosis, Peanut stem necrosis disease, Kalahasti malady.
4. Sesamum diseases – Phyllody, Alternaria leaf spot, powdery mildew, charcoal rot, bacterial leaf spot.
5. Castor diseases – wilt, root rot, grey mold, bacterial leaf spot, seedling blight, rust.
6. Sunflower diseases – leaf blight, rust, powdery mildew, head rot, collar rot, downy mildew, mosaic, sunflower necrosis virus.
7. Safflower diseases – Alternaria leaf blight, wilt, rust, mosaic.

UNIT-V

(6 Hrs.)

1. Mustard diseases – White rust, downy mildew, powdery mildew, Alternaria leaf spot, Sclerotinia stem rot.
2. Red gram diseases – Phytophthora blight, wilt, sterility mosaic and, bacterial leaf spot and stem canker.
3. Bengal gram diseases – wilt, rust, Ascochyta blight, stem and root rot, grey mold.

4. Black gram and Green gram diseases – Powdery mildew, rust, Cercospora leaf spot, Corynespora leaf spot, Angular black spot, Dry root rot, web blight.
5. Blackgram and Greengram diseases – Bacterial leaf spot, Yellow Mosaic virus, Leaf crinkle, Cuscuta.
6. Soybean diseases – Rhizoctonia blight, seed and seedling rot, rust, Soybean mosaic, Bacterial pustule; Pea diseases - downy mildew, powdery mildew and rust.
7. Cowpea diseases – Cowpea mosaic virus disease.; Lentil diseases - rust and wilt.

PRACTICALS

Study of the symptoms, identification and histopathological studies of the following diseases.

1. Rice diseases
2. Wheat, Sorghum and Bajra diseases
3. Maize and Fingermillet diseases
4. Field visits for the diagnosis of crop diseases.
5. Sugarcane diseases
6. Tobacco diseases 6 Groundnut diseases
7. Field visits for the diagnosis of crop diseases.
8. Sunflower and Safflower diseases
9. Castor and sesamum diseases
10. Mustard diseases

References

1. Rangaswami, Gand K.Mahadevan. 2001. Diseases of crop plants in India. Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S. 2005. Plant Diseases. Oxford & IBH Publications, New Delhi.

SYLLABUS

**Subject: Agriculture and Rural Development
Principles of Integrated Pest & Disease Management**

Semester: V Course Title:

Course Code: PATH372

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(6 Hrs.)

1. Integrated disease management – Introduction, concept, Total system approach, Subsystem of IPM, IPM strategies, Integration of practices, Benefits and limitations.
2. Disease triangle, Disease pyramid, Factors affecting disease epidemics, Disease incidence-disease severity, Area under disease progress curve, Descriptive disease scales in important crops with examples. Survey and surveillance of plant diseases: Objectives, methodology and reporting results. Use of Remote sensing technology in Plant Pathology.
3. Plant disease forecasting – meaning – advantages, methods in forecasting, information needed for forecasting, examples of disease forecasting models.
4. Classification of fungicides based on chemical group and antibiotics with examples.

UNIT-II

(6 Hrs.)

1. Methods of disease control: Host plant resistance – advantages– Flor's gene for gene hypothesis – types of resistance – vertical and horizontal resistance – mechanism of resistance. Cultural methods, mechanical methods and physical methods with examples. Biological control – Biocontrol organisms – mechanisms of biocontrol – examples- mass multiplication methods.
2. Integrated disease management in important crops: Rice, Groundnut, Cotton and Chillies 8. Integrated disease management in important crops – Mango, Banana, Citrus and Brinjal.

UNIT-III

(6 Hrs.)

1. Economic importance of insect pests. Pest risk analysis - Calculation and dynamics of economic injury level and importance of Economic threshold level.
2. Methods of detection and diagnosis of insect pests – types of insect damage on crop plants based on the types of mouth parts (biting and chewing, piercing and sucking, lacerating and sucking, siphoning and degenerate types).
3. Ecological management of crop environment - Ecological principles – importance of ecosystem concept – ecological niche – Agro ecosystem components and services in management of crop environment.

UNIT-IV

(6 Hrs.)

1. Introduction to conventional and botanical pesticides for the insect pests and disease management.
2. Survey & surveillance and forecasting of Insect pests, Case histories of IPM programmes – success stories. Development and validation of IPM modules for major crops.
3. Problem identification – Research and development of IPMs – Modules for major Agricultural and horticultural crops and validation.

UNIT-V

(6 Hrs.)

1. Implementation and impact of IPM (IPM module for Insect pest) - IPM modules for major field crops (paddy, sugarcane, cotton, pulses and ground nut) major vegetables (brinjal, tomato, okra, cabbage and cauliflower), mango and coconut – Impact studies of IPM modules and constraints in implementation.
2. Political, social and legal implication of IPM - Safety issues in pesticide uses – legislative measures – Awareness about IPM, Farmers participation – Government support.
3. Safety issues in pesticide uses – Pesticide risk assessment, management and communication, use in agriculture. Environmental impact – health effects – residues, resurgence and resistance – effect on non-target organisms – Strengths and weaknesses of pesticides.

REFERNCES

1. Rangaswami, G & Mahadevan, K.2001. Diseases of crop plants in India, Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S.2005. Plant Diseases. Oxford & IBH Publications, New Delhi
3. Pathak, V.N.2001. Diseases of Fruit crops. Oxford & IBH Publications, New Delhi
4. Singh, R.S.1999. Diseases of Vegetable crops. Oxford & IBH Publications, New Delhi

5. Chaube, H.S and V.S. Pundhir, 2012. Crop Diseases & Their Management. PHI Pvt.Ltd, New Delhi

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Rural Industrialization and Entrepreneurship

Course Code: RERD203

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I (6 Hrs.)

Rural Industrialisation 14 Hours Concept, Need and Importance - Growth of Rural Industries in India – Gandhian Approach and Modern Approach-Problems and Remedies of Rural Industrialisation.

UNIT-II (6 Hrs.)

Rural Industries in India 14 Hours Growth and Structure of Rural Industries, Current Status, Measures to Sustain Growth, Sickness – Remedial Measures.

UNIT-III (6 Hrs.)

Small Scale and Cottage Industries in Rural India 10 Hours Meaning, Definition, Role, Present Position, MSME – Industrial Policies and Programmes, Problems – KVIC and its Role.

UNIT-IV (6 Hrs.)

Rural Industrial Financing 12 Hours Sources of Credit - Institutional and Non – Institutional -Role of Commercial Banks, Co-operatives, Gramina Banks and NABARD.

UNIT-V (6 Hrs.)

Rural Industrial Labour 10 Hours Meaning, Importance, Types - Organized and Unorganized Rural Industrial Labour – Rural Industrial Labour Problems - Labour Turn Over – Migration.

References

1. Vasant Desai: Rural Development in India, Himalaya Publishing House, Mumbai, 2012.
2. Dutt and Sundaram- Indian Economy, S.Chand Publications, New Delhi, 2013-07-02.
3. S.K. Mishra and V.K. Puri- Economics of Development and Planning, Himalaya Publishing House, Mumbai, 2012.

SYLLABUS

Subject: Agriculture and Rural Developments
Course Title: Problematic Soils and their Management
Course Code: SSAC321
No. of Hours: 15 Hrs.

Semester: V

Credits: 1

UNIT-I

6 (Hrs.)

1. Problem soils –Definition – Different types of problematic soils – Extent and distribution of problematic and wastelands soils in different agro-eco systems and in Andhra Pradesh.
2. Salt affected soils – Origin and formation - Distribution of salt affected soils in India and Andhra Pradesh - Characteristic features of saline, sodic and saline – sodic soils – Diagnostic criteria based on properties.
3. Saline soils – Visual symptoms for identification of saline soils – Build-up of salinity - Effect of salinity on plant growth and nutrient availability - Reclamation and management.

UNIT-II**(6 Hrs.)**

1. Sodic soils - Visual symptoms for identification of sodic soils - Effect of sodicity on plant growth and nutrient availability - Reclamation and management.
2. Acid soils – Extent of area in India and Andhra Pradesh – Formation - Characteristics of acid soils – Sources of soil acidity – nutrient limitations and toxicity – Reclamation of acid soils - Different liming materials used for reclamation – Benefits of liming – Harmful effects of over liming.
3. Acid sulphate soils – Origin – Types – Characterization - Constraints and management.

UNIT-III**(6 Hrs.)**

1. Land degradation - Eroded, compacted, flooded and water-logged soils – Biologically sick soils – Effects on plant growth – Management.
2. Polluted soils – Definition – Sources of pollution – Bio solid wastes – Industrial effluents (distillery, paper mill, tannery, textiles industrial effluents) – Mechanism of interaction of wastes with soil.
3. Soil pollution - Potentially toxic elements - Excessive use of fertilizers, pesticides and weedicides – Heavy metal contamination – Management.

UNIT-IV**(6 Hrs.)**

1. Bio-remediation of problem soils through Multi-Purpose Tree Species.
2. Taxonomic classification of soils - Land Capability Classification.
3. Land suitability classification - Index – Criteria - Different approaches–Land suitability for different crops.

UNIT-V**(6 Hrs.)**

1. Remote Sensing and GIS techniques in diagnosis, mapping and management of degraded and problematic soils.
2. Soil health and quality – Definition - Concepts – Soil resilience – Factors affecting soil quality (Physical, chemical and biological) – Assessment of soil quality - Management and improvement of soil quality.
3. Irrigation water – Quality and standard parameters - Classification based on ICAR, CSSRI and USDA criteria. 16. Guidelines for judging quality of water - Utilization of saline water in agriculture.

References

1. Indian Society of Soil Science. 2012. Fundamentals of Soil Science, IARI, New Delhi.
2. Das, D. K. 2015. Introductory Soil Science. 4th Edition, Kalyani publishers, New Delhi.
3. Soils of Andhra Pradesh, Monograph of I.V. Subbarao.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Protected Cultivation and Post-harvest technologies - Practical

Course Code: AENG351P

No. of Hours: 30 Hrs.

Credits: 1

PRACTICALS

1. Study of different types of greenhouses based on shape, etc.
2. Computing the rate of air exchange in an active summer and winter cooling systems.
3. Feasibility study on drying of agricultural products inside a greenhouse and its calculation.
4. Visit to post harvest technology units and laboratories.
5. Determination of moisture content of various grains by oven drying and infrared methods.
6. Determination of size, space, porosity, bulk density, etc., of grains.
7. Determination of aerodynamic properties of grains.
8. Cleaning and grading of grains, pulses and oilseeds.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

**Course Title: Geo informatics and Nanotechnology for Precision Farming and Practical
Crop Production - Practical**

Course Code: AGRO301P

No. of Hours: 30 Hrs.

Credits: 1

EXPERIMENTS (10 Hours)

1. SSAC GIS software, spatial data creation and editing.
2. SSAC Image processing software.

3. SSAC Visual and digital interpretation of remote sensing images.
4. SSAC Generation of spectral profiles of different objects.
5. AGRO Supervised and unsupervised classification and acreage estimation.
6. SSAC Multispectral remote sensing for soil mapping.
7. SSAC Creation of thematic layers of soil fertility based on GIS.
8. AGRO Creation of productivity and management zones.
9. AGRO Fertilizers recommendations based of VRT and STCR techniques.

References

1. Pradeep. T. 2007. NANO: The Essentials: Understanding Nanoscience and Nanotechnology. Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Lillesand, T.M. and Kiefer, R. W. 1994. Remote sensing and image interpretation. (3rd edition), John Wiley and Sons.
3. Anji Reddy, M. 2006. Text book of Remote sensing and Geographical Information Systems, (3rd edition), B.S. Publications, Hyderabad.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Principles of Food Science and Nutrition Practical

Course Code: BICM300P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Food groups- Grouping of foods, discussion on nutritive value.
2. Measuring ingredients methods of measuring different types of foods- grains, flours and liquids.
3. Edible portion: Determination of edible portion of edible portion percentage of different foods.
4. Cooking methods moist heat methods-(i) boiling, simmering, steaming and pressure cooking (ii) Dry methods- baking.
5. Methods of cooking fine and coarse cereals and examination of starch.
6. Cooking and soaked and unsoaked pulses, common preparation with pulses.
7. Milk and milk products: common preparation with milk, cheese and curd, cheese curry and cooking vegetable milk.
8. Flesh foods: Fish, meat and poultry preparations.
9. Beverages preparation of hot beverages-coffee, tea.
10. Preparation of cold beverages fruit drink and milk shake.

References

1. Food science, chemistry and experimental foods by M. Swaminathan.
2. Food science by Norman.N. Potter.
3. Experimental study of foods by Griswold R.M.
4. Food science by Helen Charley.
5. Foundation of food preparation by A.G Peckam.
6. Modern cookery for teaching and trade, volume I&II, Thangam Philip. Orient Longmans Ltd.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Environmental Studies and Disaster Management - Practical

Course Code: CPHY361P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Collection, processing and storage of effluent samples.
2. Determination of chemical oxygen demand in waste water sample.
3. Estimation of dissolved oxygen in waste water sample.
4. Determination of total dissolved solids in waste water sample.
5. Analysis of temporary hardness of waste water sample by titration.
6. Analysis of total hardness of waste water sample by titration.
7. Preparation of sludge / waste water sample for analysis of heavy metals.
8. Estimation of heavy metals in sludge / waste water by Atomic Adsorption Spectrophotometer (AAS).

References

1. Bharucha, E. 2005. Text book of Environmental Studies for undergraduate courses. University Grants Commission, New Delhi.
2. Anjaneyalu, Y. 2004. Introduction to Environmental Science. BS Publications, Hyderabad, A.P. India.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Pests of Field crops and Stored Grain and their Management -Practical

Course Code: ENTO331P

No. of Hours: 30 Hrs.

Credits: 1

PRACTICALS

1. Typical symptoms of damage by various phytophagous insects.
2. 2 Calculations on the doses of insecticides and their application techniques.
3. 3 Identification of major insect pests of rice and their damage symptoms.
4. 4 Identification of major insect and mite pests of sorghum, maize and other millets, and their damage symptoms.
5. 5 Identification of insect pests of sugarcane and their damage symptoms.
6. 6 Identification of insect pests of cotton, sunhemp and mesta and their damage symptoms.
7. Identification of insect pests of pulse crop and their damage symptoms.
Identification of insect pests of oil seed crops and their damage symptoms.
8. Mite pests of crops and their damage symptoms.
9. Nematode pests of crops and their damage symptoms.
10. Rodent pests of crops and their nature of damage.

References

1. Vasantharaj David, B. and Rama Murthy V.V. 2016. Elements of Economic Entomology, Popular Book Depot, Coimbatore.
2. Vasantharaj David, B and Aanathakrishnan, T.N. 2006. General and Applied Entomology. Tata McGraw-Hill Publishing House, New Delhi.
3. Nair MRGK. 1986. Insects and Mites of crops in India. Indian Council of Agricultural Research New Delhi.

4. Ramakrishna Ayyar, T.V. 1963. Handbook of Economic Entomology for South India. Government Press, Madras.
5. Dennis S Hill 1987 Agricultural Insect Pests of tropics and their control, Cambridge Universtiy Press, New York.
6. Upadhyaya K.P. and Kusum Dwivedi. 1996. A Text Book of Plant Nematology. Aman Publishing House, Meerut.
7. Khare, S.P. 1993. Stored Grain Pests and their Management. Kalyani Publishers, Ludhiana.
8. Atwal, A.S. 1976. Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Crop Improvement - I (*Cereals, Millets, Pulses and Oilseeds*) and Intellectual Property Rights - Practical

Course Code: GPBR311P

No. of Hours: 30 Hrs.

Credits: 1

PRACTICALS

1. Hybridization techniques and precautions to be taken, Floral morphology, selfing, emasculation and crossing techniques in field crops
2. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in rice.
3. 3 Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Wheat and Barley.
4. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Maize and Sorghum.
5. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Pearl millet and Finger millet.
6. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Kodo millet and Proso millet.
7. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Chickpea and Pigeonpea.

8. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Urdbean and Mungbean.
9. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Soybean and Cowpea.

References

1. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
2. Phundan Singh. 2006. Essential of Plant Breeding. Kalyani Publishers, Ludhiana.
3. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. Principles and Practices of Plant Breeding. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kalloo, G. 1994. Vegetable Breeding. Panima Educational Book Agency, New Delhi.
6. Kumar, N. 2006. Breeding of Horticultural Crops-Principles and Practices. New India Publishing Agency, New Delhi
7. George Acquaah. 2012. Principles of Plant Genetics and Breeding. Blackwell Publishing Ltd., USA
8. Mono graphs available on specific crops.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

**Course Title: Diseases of Field and Horticultural Crops and their Management - I (Field Crops)
- Practical**

Course Code: PATH371P

No. of Hours: 30 Hrs.

Credits: 1

CO5: Discuss the symptoms, identification and histopathological studies of Castor and sesamum diseases

Practicals

Study of the symptoms, identification and histopathological studies of the following diseases.

1. Rice diseases
2. Wheat, Sorghum and Bajra diseases
3. Maize and Fingermillet diseases
4. Field visits for the diagnosis of crop diseases.
5. Sugarcane diseases
6. Tobacco diseases 6 Groundnut diseases
7. Field visits for the diagnosis of crop diseases.
8. Sunflower and Safflower diseases
9. Castor and sesamum diseases
10. Mustard diseases

References

1. Rangaswami, Gand K.Mahadevan. 2001. Diseases of crop plants in India. Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S. 2005. Plant Diseases. Oxford & IBH Publications, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Developments **Semester: V**
Course Title: Principles of Integrated Pest & Disease Management - Practical
Course Code: PATH372P
No. of Hours: 30 Hrs. **Credits: 1**

Practicals

1. Identification of plant diseases based on symptoms and signs.
2. Laboratory methods used in the diagnosis of Plant diseases.
3. Methods of measurement of plant diseases, descriptive disease scales for important diseases. Plotting AUDP curves.
4. Methods to assess crop yield losses due to crop diseases with examples.
5. Identification of disease biocontrol agents – Trichoderma, Pseudomonas, Bacillus spp. – Laboratory isolation procedures.
6. Mass multiplication of biocontrol agents: Trichoderma and Pseudomonas.
7. Crop monitoring for assessment disease dynamics – Decision making.
8. IDM and non-IDM methods – Cost benefit analysis – Case studies.

References

1. Dhaliwal, G. S. and Ramesh Arora 2001. Integrated pest management: Concepts and approaches, Kalyani Publishers Ludhiana.
2. Metcalf, R. L .and Luckman, W. H. 1982. Introduction to insect pest management. W iley inter science publishing, New York.
3. Larry P Pedigo 1991. Entomology and pest management, Prentice Hall of India Private Ltd., New Delhi.
4. Venugopala Rao, N., Umamaheswari, T., Rajendraprasad, P., Naidu, V.G and Savithri, P. 2004. Integrated Insect Pest Manag ement. Agrobios (India) Limited, Jodhpur.
5. Chaube, H.S. and Ramji Singh. 2001. Introductory Plant Pathology. International Book Distribution Co., Lucknow. 136.
6. Mehrotra, R.S. 1980. Plant Pathology. Tata McGraw - Hill Publishing Co. Ltd., New Delhi.
7. Singh, R.S. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH Publ. Co. Pvt.. Ltd., New Delhi.
8. Vidyasekharan, P. 1993. Principles of Plant Pathology. CBS Publishers and Distributors, New Delhi. 9. Y. L. Nene and P.N. Thaplial, 1993, Fungicides in Plant Disease Control. Oxford and IBH Publishing Co.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: V

Course Title: Problematic Soils and their Management - Practical

Course Code: SSAC321P

No. of Hours: 30 Hrs.

Credits: 1

PRACTICALS

1. Field identification of problematic soils and visit to degraded lands.
2. Determination of infiltration rates of light soils.
3. Determination of infiltration rates of heavy soils.
4. Determination of aggregate stability of sodic soils.
5. Determination of pH, EC of acid, saline and sodic soils.
6. Determination of ESP of sodic soils.
7. Determination of GR of sodic soils.
8. Determination of LR of acid soils.
9. Determination of lime content (CaCO_3) of calcareous soil.
10. Determination of pH and EC of saline, sodic and good quality irrigation water.

References

1. Indian Society of Soil Science. 2012. Fundamentals of Soil Science, IARI, New Delhi.
2. Das, D. K. 2015. Introductory Soil Science. 4th Edition, Kalyani publishers, New Delhi
3. Soils of Andhra Pradesh, Monograph of I.V. Subbarao.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Farm Management, Production and Resource Economics

Course Code: AECO341

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(6 Hrs.)

1. Meaning and concept of farm management, definitions, objectives and relationship with other sciences - Importance of study of farm management - Farm management problems in India.
2. Meaning and definitions of types and systems of farming and their characteristics - Changing structure of land holdings in India - Characteristics of small, marginal and tenant farm holdings.
3. Concept of production function and its types, use of production function in decision -Making on a farm - Seven principles of farm management.
4. Factor - Product relationship – Law of variable proportions – Definition, graphical and arithmetical explanation with the help of an example.

UNIT II

1. Determination of optimum input and optimum output and decision rules.
2. Factor-Factor relationship, resources and types - Substitutes and complements, variable and fixed resources - Iso-quants - Iso-cost lines-Meaning and characteristics - Principle of least cost combination/ Principle of factor substitution - Explanation and decision rules.
3. Product-Product relationship - Iso- product curves and Iso-revenue lines-Meaning and characteristics - Principle of optimum product combination - Law of equimarginal returns/ principles of opportunity cost, decision rules.

UNIT-III

(6 Hrs.)

1. Types of enterprises and their characteristics - Principle of comparative advantage.
2. Meaning and concept of cost, cost function /cost-output relationship - Types of production costs and their interrelationship - Importance of costs in managing farm business - Minimum loss principle (Cost Principle) and decision rules - Time comparison principle – compounding and discounting.

3. Farm inventory - Meaning and importance of taking inventory on farm business - Different methods of appraisal and valuation of farm resources and products.

UNIT-IV

(6 Hrs.)

1. Farm planning and budgeting - Meaning and importance, partial budgeting, enterprise budgeting and complete budgeting, steps in farm planning and budgeting.
2. Linear Programming-Meaning - Definition, LP mathematical model specification, importance in farm decision making, basic assumptions, limitations.
3. Concepts of risk and uncertainty in agriculture production, nature and sources of risks and uncertainty and management strategies.

UNIT-V

(6 Hrs.)

1. Economy and environmental linkages - How economic activity affects life on a planet with limited resources and a fragile environment - Concepts of natural resource economics - Ecological equilibrium, direct use value and indirect use value, willingness to accept and willingness to pay, contingent valuation, opportunity cost, discounting, societal cost - benefit analysis, consumer surplus, carbon sequestration - Unique properties of natural resources.
2. Environmental costs of economic growth - Sustainable development - Positive and negative externalities in agriculture - Inefficiency and welfare loss, solutions.
3. Important issues in economics and management of common property resources of land, water, pasture and forest resources etc. - India's environmental policy.

References

1. Bishop, C.E. and W. D. Tousaint. 1958. Introduction to Agricultural Economic Analysis. John Wiley and Sons, London.
2. Heady, Earl O. 1964. Economics of Agricultural Production and Resource Use. Prentice Hall of India, Private Limited, New Delhi
3. S.S. Johl, J.R. Kapur. 2006. Fundamentals of Farm Business Management Kalyani Publishers, New Delhi.
4. Kahlon, A.S. and Karam Singh. 1965. Principles of Farm Business Management. Kalyani Publishers, New Delhi.

5. Raju, V.T. and D.V.S. Rao. 2006. Economics of Farm Production and Management. Oxford & IBH Publishing Co. Pvt. Limited, New Delhi
6. www.core_economics.org.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Communication Skills and Personality Development

Course Code: AEXT391

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I**(6Hrs.)**

1. Communication - Meaning and process of communication, verbal and nonverbal communication.
2. Communication skills - Structural and functional grammar.
3. Listening and note taking, writing skills, oral presentation skills.
4. Voice modulation basics and their usage for meaningful impact on people.

UNIT-II**(6Hrs.)**

1. Field diary and lab record; indexing, footnote and bibliographic procedures.
2. Reading and comprehension of general and technical articles and precise writing - summarizing, abstracting; individual group presentations.
3. Extempore, impromptu and prepared presentations, public speaking; group discussion - Organizing seminars and conferences.

UNIT-III**(6Hrs.)**

1. Human behaviour - Domains and components of behaviour.
2. Personality and personality development - Meaning, scope, importance, factors influencing personality - Traits and type, approaches.
3. Personality theories.

UNIT-IV**(6Hrs.)**

1. Importance of wants, desires, needs, drives, motives, aspirations, interests, objectives and goals in personality development.
2. Transactional analysis, - Importance, methods and strategies.
3. Negotiation skills, stress management and conflict management - Meaning, concept, steps and techniques.

UNIT-V**(6Hrs.)**

1. Emotional intelligence - Meaning, concept and importance.
2. Creativity - Meaning, concept, components and characteristics of creative people.
3. Team work - Meaning, concept, characteristic features of effective teams, types of teams, factors affecting and role of team work.

References

1. Dangi K.L., S.S. Sisoda, Pravesh Singh Chauhan and Yogita Ranavat. A Text Book of Communication Skills. Agrotech Publications.
2. Mangal S.K. 2016. Essentials of Educational Psychology. PHI Learning Private Ltd., New Delhi.
3. Nirajkumar. 1997. A Genesis of Behavioural Science. Gyan Publishing House, New Delhi.
4. Eric Berne. 1964. Games People Play-The Psychology of Human Relationship. Grove Press Publishers.
5. Thomas Anthony Harris. 1967. I am Ok You are Ok. Harper Publishers.
6. Scott Bill. 1981. Skills of Negotiating.
7. Goleman Daniel. 1995. Emotional Intelligence.
8. Ratan Reddy B and Supriya Reddy. Soft Skills for Professional Excellence.
9. Shivkhera. 2002. You can win. MacMillan Publishing Company. New Delhi.
10. Shivaraman K. 2009. Communication Skills APH.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Rain fed Agriculture, Watershed Management and Principles of Organic Farming

Course Code: AGRO303

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

1. Rainfed agriculture – introduction and definition – dimensions of the problem – area and production from dry lands in India and Andhra Pradesh –History of rainfed agriculture and watersheds in India.

2. Problems and prospects of rainfed agriculture in India – climate – rainfall pattern – distribution – variabilities of rainfall – short rainy season – high intensity rainfall.
3. Problems and prospects of rainfed agriculture in India - soil characteristics – soil fertility status –soil moisture storage and retention capacity – heavy weed infestation-soil crust and their effect on crop growth and soils-its management.
4. Drought – definition – types of drought – effect of water deficits on physio morphological characteristics of the plants- mechanism of crop adaptation under moisture deficit condition - management strategies for drought.

UNIT-II

1. Tillage for rainfed crops – off-season tillage – primary tillage –secondary tillage – year-round tillage – sub soiling – setline cultivation – modern concepts of tillage- minimum tillage and zero tillage.
2. Soil erosion – definition – losses due to erosion – types of water and wind erosion – nature and extent of wind and water erosion – factors affecting erosion – universal soil loss equation.
3. Management of crops in rainfed areas - Agronomic measures of soil and water conservation – choice of crop – crop geometry – tillage – contour cultivation – strip cropping – cover cropping – mulching – cropping systems and weed control - Mechanical measures of soil and water management.

UNIT-III

1. Watershed – definition – concept— objectives and principles of water shed management components of watershed development programme – factors affecting watershed management.
2. Water harvesting – importance, its techniques- Water harvesting structures – arid region – runoff farming – water spreading – micro catchments – semi arid region – farm ponds, check dams – percolation tank – dug wells – life saving irrigation.
3. In-situ moisture conservation measures – bund forming – bunding, ridge and furrow system – conservation furrows- inter plot water harvesting, mulching – Broad Bed and Furrow (BBF) and levelling.

UNIT-IV

1. Fertilizer use in rainfed areas – use of organic manures – introduction of legumes in crop rotation– organic recycling and bio-fertilizer use in rainfed agriculture – time and method of fertilizer application.
2. Efficient crops and varieties – cropping systems in rainfed areas – intercropping – advantages – efficient inter cropping systems in different rainfed regions of Andhra Pradesh.
3. Contingent crop planning for aberrant weather conditions in red and black soils.

UNIT-V

1. Evapotranspiration – measures to reduce evapotranspiration – weeding, use of mulches, chemicals, windbreaks and shelterbelts.
2. Land capability classification – alternate land use system.
3. Efficient utilization of water through soil and crop management practices - agronomic measures - mechanical measures for soil and water conservation – gully control – bench terraces – contour terracing – graded bund.

References

1. Reddy, S. R. and Prabhakar Reddy, G. 2015. Dryland Agriculture. Kalyani Publishers.
2. Arnon,I. 1972. Crop Production in Dry Regions (Vol.I), Leonard Hill Pub. Co, London.
3. Dhruva Narayana, V.V., Sastry, G.S. and Patnaiak, V.S. 1999. Watershed Management in India. ICAR, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Agricultural microbiology

Course Code: AMBE373

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(3 Hrs.)

1. Introduction- Definition- The hidden world of microbiology- How microbes evolved on earth- General classification of microbes-Microorganisms and principles of microbiology- Scope of microbiology. Brief History of microbiology - Spontaneous generation theory- Contributions of Antony Van Leeuwenhoek Francesco Redi- Lazzaro Spallanzani- Franz Schulze- Schroder and Von Dusch- Louis Pasteur- John Tyndall.
2. Role of microbes in fermentation-Contributions of Cagnaird Latour-Theodor Schwann, F.Kutzing- Louis Pasteur - Germ theory of disease - Contribution of Hippocrates-Louis Pasteur- Robert Koch - Pure Culture Methods- Joseph ListerRobert Koch- Beijerinck-Winogradsky- Francois Appert- Schroder and Von DushJohn Tyndall.

3. Protection against infection-Contributions of Edward Jenner- F. Loeffler- Behring Kitasato- Louis Pasteur - Applied aspects of Microbiology- Agricultural microbiology-Industrial microbiology-Food Microbiology - Medical microbiology – Water Microbiology - Geochemical Microbiology- Pollution microbiology – Air microbiology – Exo-Microbiology - Microbial biotechnology.
4. Morphological types of Bacteria , Bacteria cell Structure- External and internal cell structures- Differences between Prokaryotes and Eukaryotes.

UNIT-II

(3 Hrs.)

1. Microbial Nutrition- Autotrophy - Chemoautotrophy- Photoautotrophy
2. Heterotrophy – Metabolic pathways-Glycolysis-HMP-ED-TCA cycle.
3. Growth of Microorganisms - Cell Division - Growth cycle of bacteria [Lag phase, Log phase, Stationary and Death phase]- Generation time- Growth rate- Growth yield- Synchronous - Diauxic growth.

UNIT-III

(3 Hrs.)

1. Bacterial genetics- Genetic recombination- Transformation- ConjugationTransduction- Plasmids- Transposon.
2. Role of microbes in fertility of soils and plant growth - Rhizosphere- RhizoplanePhyllosphere- Phylloplane - Microflora- Carbon cycle- Carbon dioxide fixation.
3. Nitrogen cycle - Mineralisation- Immobilisation- Nitrification- DenitrificationNitrogen Fixation - Phosphorus cycle, phosphorus solubilisation – Oxidation – Reduction - Sulphur cycle-Oxidation and reduction.

UNIT-IV

(3 Hrs.)

1. Biological nitrogen fixation - Symbiotic- Associative- Asymbiotic- Nitrogen fixation In Azolla - Blue green algae - Actinorhizal symbiosis - Frankia, Phosphate solubilizing microorganisms - Bacillus - Pseudomonas- Mycorrhiza for Phosphorous uptake.
2. PGPR Organisms - Bacillus – Pseudomonas – Azotobacter – Azospirillum - Rhizobium -Microbes in human welfare.
3. Types of fermentations - Batch - Batch fed- Continuous - Solid State Fermentations, Common microbial fermentations- Alcohol- Lactic acid- Butyric acid- Formic acid - Butanediol- Propionic Acid- Mixed Acid - Fermentation technology- Alcoholic beverages production.

UNIT-V

(3 Hrs.)

1. Biofertilizers (Bacterial-Cyanobacterial-Fungal) production technology- Silage Production Technology.
2. Biopesticides- Viruses (Nucleo polyhedrosis virus - Granular viruses) – Bacteria (Bacillus thuringiensis, Bacillus papilliae) - fungi (Beauveria - Verticillium) - Protozoa (Malameba locustae-Mattesia Spp)-Mode of action.
3. Biofuel Production- Biodegradation - Biogas, Biomanures and Composting Technologies.

References

1. Microbiology. Pelczar, J.r., M.J.E.C.S.Chan and Krieg, N.R. (5th Ed.) 2015. McGraw Hill Publishers, New York.
2. Microbiology. Prescott, L.M., Harley, J.P. and Klein, D.A. (9th Ed.) 2014. McGraw Hill Publishers, New York.
3. Brock Biology of Microorganisms.Madigan, M.,Martinko, J.M and Parker, J. (14Ed.) 2015. Prentice hall of India Pvt Ltd., New Delhi.
4. Soil Microbiology: Subba Rao, N.S. (4th Ed.) 2014. Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.
5. Microbiology A Laboratory Manual: James, C and Natile, S. (10th Ed.) 2014. Pearson India Education Services Pvt. Ltd., South Asia.
6. Experiments in Microbiology, Plant Pathology and Biotechnology. Aneja, K.R.2011. New Age International (P) Ltd., Publishers, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development
Course Title: Fundamentals of plant biotechnology
No. of Hours: 15 Hrs.

Semester: VI
Course Code: BICM302
Credits: 1

UNIT-I

(6 Hrs.)

1. Introduction – Historical aspects of Biochemistry– Scope, impact and importance of Biochemistry in plant sciences - Properties of water – PH – Buffers. 171.
2. Carbohydrates– Classification - Structures – Monosaccharides – Structural aspects – mutarotation - Reducing and oxidizing properties.
3. Oligosaccharides and polysaccharides-Functions of carbohydrates.
4. Lipids – Fatty acids – Structures and properties – Functions of lipids.
5. Lipids - Classification – Storage lipids and membrane lipids – Saponification, hydrogenation, Iodine number and Acid value.
6. Amino acids – Structures - Classification – Zwitterions – Titration.
7. Peptides – Oligopeptides – Cyclic and acyclic peptides – Malformin, Glutathione, Gramicidin – Functions of peptide.

UNIT-II

(6 Hrs.)

1. Proteins –Importance - Classification - Properties of proteins –Isoelectric PH – Denaturation - Protein sequencing – Edman degradation method.
2. 9 Proteins – Structural organization – Primary, secondary, tertiary and quaternary structures and forces involved in stabilizing proteins.
3. Enzymes – Characteristics of enzymes – Chemical nature, speed, specificity, active site - activation energy – Mechanism of enzyme action.
4. Classification of enzymes - Isoenzymes – Multienzyme complex – Allosteric enzymes and coenzymes.
5. Measurement of enzyme activity – Factors effecting enzyme activity – Enzyme Inhibition – MM & LB plots.
6. Nucleic acids – Functions – Structures of nitrogen bases – Nucleosides – Nucleotides in RNA and DNA.

UNIT-III

(6 Hrs.)

1. Various types of DNA and RNA – Secondary structure of B-DNA and t-RNA.
2. Metabolism – Anabolism and Catabolism – Stages of respiration – Overall metabolic view of carbohydrates, proteins and lipids.
3. Metabolism of carbohydrates – Glycolysis – Aerobic and anaerobic.
4. Tricarboxylic Acid (TCA) cycle— Glyoxalate cycle – Electron transport chain.
5. Metabolism of lipids –Biosynthesis of fatty acids and tri acyl glycerol
6. Catabolism of lipids α , β & γ oxidation of fatty acids in brief and α oxidation in detail.

UNIT-IV

(6 Hrs.)

1. Protein Biosynthesis and post translational modifications

2. Secondary metabolites – Terpenoids – Alkaloids - Phenolics – Importance
3. Biotechnology – Major – Concepts and importance – Applications of plant biotechnology.
4. Introduction to plant tissue culture – History – Scientists - Terminology – Steps in general tissue culture – Types of sterilization and nutrient media – Types of cultures – Organ cultures, cell suspension culture, callus culture, pollen culture and their applications.
5. Micro propagation – Procedure techniques – Organogenesis and embryogenesis – Problems – Advantages – Limitations.
172
6. Anther culture – embryo culture – Ovule culture – Somatic embryogenesis - Synthetic seeds and its applications.

UNIT-V

(6 Hrs.)

1. Protoplast isolation and fusion – Somatic hybridization – Cybrids – Somaclonal variations and applications in crop improvement – Cryo preservation
2. Recombinant DNA methods - Introduction to genetic engineering – Definitions – Gene cloning - Vectors.
3. Gene transfer methods – Indirect methods (Agrobacterium) and direct methods (physical-gene gun method; chemical-PEG mediated and other methods) with case studies / examples.
4. Transgenic plants – Present status - Applications in crop improvement – Limitations – biotechnology regulations.
5. Polymerase chain reaction (PCR) – Procedure and applications.
6. Markers - Morphological, biochemical and molecular markers – RFLP, RAPD and SSR – Marker assisted selection for crop improvement.

References

1. David L. Nelson, Michael M.Cox; W.H. Freeman.Lehninger Principles of Biochemistry, 6th Edition.
2. Biochemistry, Dr.U.Satyanarayana, Dr.U. Chakrapani, Books and Allied(P) Ltd, Kolkata.
3. Biochemistry, S.N.Gupta, Rastogi Publications, First Edition, 2011.
4. Introduction to Plant Biotechnology by HS Chawla (3rd Edition), Oxford & IBH Publishing Co. Pvt Ltd., New Delhi.

SYLLUBUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Pest of Horticultural Crops and their Management and Beneficial insects

Course Code: ENTO332

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

1. General account on nature and type of damage by different arthropod pests. Scientific name, order, family, host range, distribution, marks of identification, bionomics, nature of damage, and management of major, minor insect pests and other important arthropod pests of various vegetable crops, fruit crops, plantation crops, ornamental crops, narcotics, spices and condiments.
2. Brinjal- Epilachna beetle, shoot and fruit borer, stem borer, mealy bug, aphid, leafhopper, lacewing bug, leaf webber and red spider mite- IPM practices.
3. Bhendi- Shoot and fruit borer, leafhopper and whitefly and spider mite - TomatoSerpentine leaf miner, South American Leaf miner/ Tomato pink worm, fruit borer and whitefly - IPM practices.
4. Cucurbits- Fruit flies, pumpkin beetles, semilooper, serpentine leaf miner and pumpkin leaf eating caterpillar - Coccinia-Coccinia gall fly and aphids - IPM practices.
5. Crucifers- Diamond back moth, cabbage head borer, leaf webber, aphid, painted bug, tobacco caterpillar and cabbage butterfly - IPM practices.
6. Potato- Tuber moth - Sweet potato - Sweet potato weevil, hairy caterpillar, tortoise beetle - Moringa- Hairy caterpillar, budworm, leaf webber and pod fly – Chillies Thrips, pod borers, aphid, mites, blossom midge - Amaranthus- Leaf eating caterpillar, stem weevil - IPM practices.

7. Mango- Leafhoppers, stem borer, nut weevil, fruit fly, shoot borer, fruit borer, mealybug, aphids, leaf webber, termites, thrips, red tree ant, leaf gall midges and red spider mite - IPM practices.

UNIT-II

(6 Hrs.)

1. Citrus- Butterfly, fruit sucking moths, leaf miner, psylla, rust mite, bark eating caterpillar, black fly and leaf mite.
2. Grapevine- Flea beetle, thrips, mealybug, stem girdler, stem borer, leaf eating caterpillars and root grub - IPM practices.
3. Cashew- Tree borer, shoot and blossom webber, tea mosquito bug, thrips and leaf miner Pomegranate- Butterfly, thrips and fruit sucking moths - IPM practices.
4. Guava- Tea mosquito bug, mealybug, fruit flies and spiralling whitefly – Sapota Leaf webber, parijatha hairy caterpillar, mealybugs - Ber- Fruit fly, fruit borer and fruit weevil.
5. Banana- Rhizome weevil, skipper, aphid and pseudostem weevil - Papaya whiteflies, mealybugs and thrips - Apple - Woolly aphid and Codling moth - Custard apple- Mealybug - IPM practices
6. Coconut- Black headed caterpillar, rhinoceros beetle, red palm weevil, slug, termites, scale and mite - Oil palm- Black headed caterpillar, rhinoceros beetle and red palm weevil - IPM practices.

UNIT-III

(6 Hrs.)

1. Arecanut- Scales - Cocoa - Scales - Cardamom- Thrips - Pepper- Pollu beetle and shoot borer - Eucalyptus - Gall wasp - Neem - Tea mosquito bug and white grub - IPM practices.
2. Turmeric and ginger- Rhizome fly and Lace wing bug - Betelvine- Shoot bug and tobacco caterpillar - Onion- Thrips and Spodoptera exigua - Coriander- Aphids and leaf eating caterpillar - Rose- Thrips, scales, leaf eating caterpillars and chafer beetles - Jasmine- Stink bug, bud worm and gall mite - Chrysanthemum- Aphid- IPM practices - Tobacco- Tobacco caterpillar, aphid, whitefly and stem borer - Coffee White borer, red borer and green scale; Tea- Tea mosquito bug, thrips, red spider mite, pink mite, purple mite and scarlet mite- IPM practices.
3. Economically important mite, nematode (vegetables, citrus, banana and coconut), rodent (coconut) and bird pests of horticultural crops and their management.
4. Beneficial insects – Importance of silkworm, honeybee, lac insects, predators, parasitoids, pollinators, weed killers and scavengers.
5. Species of Silkworms - Characteristic features of Mulberry Silkworm, Tasar Silkworm, Eri Silkworm and Muga Silkworm and their hosts- Biology – Voltinism - Ahimsa silk.

6. Establishment of mulberry garden – Planting season and land preparation, preparation of planting material - Irrigation-spacing, varieties, planting inter cultivation, fertilization, irrigation, leaf harvest and leaf yield - Mulberry Planting under rainfed and irrigated conditions - Spacing and preparation of pits, planting, fertilization, inter-cultivation, maintenance, soil moisture conservation and leaf harvest - Pests and diseases of mulberry plants and their management - Rearing house, rearing equipment and appliances-rearing stand, chawki rearing trays, late age rearing trays, paraffin wax coated paper, bird feathers, bed cleaning nets, chop sticks, rubber foam, ant well, mountages, chopping knife, chopping board, feeding basins, disinfection and hygiene in rearing house.

UNIT-IV

(6 Hrs.)

1. Mulberry silkworm races - Grainage centres, brushing of silkworm larvae, young age and late age silkworm rearing - Effect of temperature, humidity, air current and photoperiod - Leaf quality and leaf maturity on larval growth and survival - Feeding of late instars, bed cleaning and bed spacing for IV and V instars
2. Mounting- mountages, mounting density, harvesting and assessment of cocoon yield and cocoon characters for marketing - Defective cocoons.
3. Silk worm diseases- Pebrine- Symptoms, mode of transmission, stages of contamination and intensity, detection and control - Viral diseases- Nucleo polyhedro Virus and Cytoplasmic Polyhedro Virus - Symptoms, prevention and control. Grasserie - Symptoms, source of contamination, prevention and control - Infectious Flacherie - Symptoms, prevention and control - Fungal Diseases- White muscardine- Source of infection, symptoms, prevention and control - Uzi fly – Biology, nature of damage and symptoms and management.
4. Beekeeping- Importance and multiple source of income - Species of Honey bees Rock bee, Little bee, Indian honey bee, European bee and Dammar bee - Bee biology Life cycle - Caste determination in honey bees- Structural adaptations of honeybees.
5. Commercial methods of rearing, – Different types of the hive- Equipment - Smoker, bee veil, gloves, honey extractor, queen gate, queen excluder sheet, drone extruder, drone trap, comb foundation sheet, dummy division board, swarm trap, bee brush, feeder, queen cage and queen cell protector - Colony management in different seasons, winter, summer and rainy seasons.
6. Bee pasturage – Different species of pollen and nectar yielding plants- Honey flow season and dearth period – Communication in bees – Round dance and wag tail dance- Management of bees for crop pollination – Queen bee

substance -Honey extraction, testing of honey, honey composition and value, bee wax, pollen, royal jelly, propolis, venom and its uses.

UNIT-V

(6 Hrs.)

1. Enemies of bees and bee brood - Nature of damage and management of Greater wax moth, lesser wax moth, wax beetle, wasps, black ants, birds etc., - Nature of damage and management of honey bee - mites, *Acarapis woodi*, *Varroa jacobsoni* and *Tropilaelaps clareae*.
2. Bee diseases – Nature of damage and management of American foul brood disease, European foul brood disease, Sac brood disease, Thai sac brood disease, Chalk brood, stone brood disease, *Nosema* and *Amoeba* disease - Colony collapse disorder in bees.
3. Lac insect- Different species, morphology, behaviour, host plants, inoculation methods, natural enemies of lac insect and their management - Lac production – Processing, different forms of lac- raw lac, seed lac, shellac and lac by - products. Recent applications of lac.
4. Identification of biological control agents - Insect predators and parasitoids, pathogens, entomopathogenic nematodes.
5. Insect orders bearing predators and parasitoids used in pest control and their key identification characters (Dictyoptera: Mantidae; Hemiptera: Reduviidae, Anthocoridae, Lygaeidae, Pentatomidae; Neuroptera: Chrysopidae, Myrmeleontidae, Hemerobiidae; Coleoptera: Carabidae, Cicindelidae, Coccinellidae; Diptera: Asilidae, Tachinidae, Syrphidae; Lepidoptera: Noctuidae, Lycaenidae, Epipyropidae, Pyralidae; Hymenoptera: Vespidae, Braconidae, Ichneumonidae, Chalcididae, Trichogrammatidae, Platygasteridae, Elasmidae, Eulophidae, Scelionidae and Strepsiptera).
6. Mass production/multiplication methods of predators (*Cheilomenes* and *Chrysoperla*) parasitoids (*Goniozus nephantidis*).
7. Important species of pollinators, weed killers, and scavengers and their significance.

References

1. Vasantharaj David, B. and V.V. Rama Murthy (2016). Elements of Economic Entomology, Popular Book Depot, Coimbatore.

2. Butani, D.K. and Jotwani, M.G. 1984. Insects in Vegetables. Periodical Export Book Agency, New Delhi.
3. Butani, D. K. 1984. Insects and Fruits. Periodical Export Book Agency, New Delhi.
4. Ganga, G and Sulochana Chetty, 1997. Introduction to Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi
5. Hisao Aragu 1994. Principles of Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi.
6. Singh, S.1975. Bee Keeping in India - Indian Council of Agriculture research, New Delhi.
7. Mishra, R.C. 1995. Honey Bees and Their Management in India – Indian Council of Agricultural Research, New Delhi.
8. Glover, P.M.1937. Lac cultivation in India. The Indian Lac research Institute, Ranchi
9. Abrol, D.P. 2010. Beekeeping: A Comprehensive Guide on Bees and Beekeeping. Scientific publishers, Jodhpur
- 10.Nair, MRGk. 1990. Monograph on Crop Pests of Kerala and their Control. Trissur Directorate of extension, Kerala agricultural University.

SYLLUBUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Pest of Horticultural Crops and their Management and Beneficial insects

Course Code: ENTO332

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I

(6 Hrs.)

8. General account on nature and type of damage by different arthropod pests. Scientific name, order, family, host range, distribution, marks of identification, bionomics, nature of damage, and management of major, minor insect pests and other important arthropod pests of various vegetable crops, fruit crops, plantation crops, ornamental crops, narcotics, spices and condiments.
9. Brinjal- Epilachna beetle, shoot and fruit borer, stem borer, mealy bug, aphid, leafhopper, lacewing bug, leaf webber and red spider mite- IPM practices.
10. Bhendi- Shoot and fruit borer, leafhopper and whitefly and spider mite - TomatoSerpentine leaf miner, South American Leaf miner/ Tomato pink worm, fruit borer and whitefly - IPM practices.
11. Cucurbits- Fruit flies, pumpkin beetles, semilooper, serpentine leaf miner and pumpkin leaf eating caterpillar - Coccinia-Coccinia gall fly and aphids - IPM practices.
12. Crucifers- Diamond back moth, cabbage head borer, leaf webber, aphid, painted bug, tobacco caterpillar and cabbage butterfly - IPM practices.
13. Potato- Tuber moth - Sweet potato - Sweet potato weevil, hairy caterpillar, tortoise beetle - Moringa- Hairy caterpillar, budworm, leaf webber and pod fly – Chillies Thrips, pod borers, aphid, mites, blossom midge - Amaranthus- Leaf eating caterpillar, stem weevil - IPM practices.
14. Mango- Leafhoppers, stem borer, nut weevil, fruit fly, shoot borer, fruit borer, mealybug, aphids, leaf webber, termites, thrips, red tree ant, leaf gall midges and red spider mite - IPM practices.

UNIT-II

(6 Hrs.)

7. Citrus- Butterfly, fruit sucking moths, leaf miner, psylla, rust mite, bark eating caterpillar, black fly and leaf mite.
8. Grapevine- Flea beetle, thrips, mealybug, stem girdler, stem borer, leaf eating caterpillars and root grub - IPM practices.
9. Cashew- Tree borer, shoot and blossom webber, tea mosquito bug, thrips and leaf miner Pomegranate- Butterfly, thrips and fruit sucking moths - IPM practices.

10. Guava- Tea mosquito bug, mealybug, fruit flies and spiralling whitefly – Sapota Leaf webber, parijatha hairy caterpillar, mealybugs - Ber- Fruit fly, fruit borer and fruit weevil.
11. Banana- Rhizome weevil, skipper, aphid and pseudostem weevil - Papaya whiteflies, mealybugs and thrips - Apple - Woolly aphid and Codling moth - Custard apple- Mealybug - IPM practices
12. Coconut- Black headed caterpillar, rhinoceros beetle, red palm weevil, slug, termites, scale and mite - Oil palm- Black headed caterpillar, rhinoceros beetle and red palm weevil - IPM practices.

UNIT-III

(6 Hrs.)

7. Arecanut- Scales - Cocoa - Scales - Cardamom- Thrips - Pepper- Pollu beetle and shoot borer - Eucalyptus - Gall wasp - Neem - Tea mosquito bug and white grub - IPM practices.
8. Turmeric and ginger- Rhizome fly and Lace wing bug - Betelvine- Shoot bug and tobacco caterpillar - Onion- Thrips and Spodoptera exigua - Coriander- Aphids and leaf eating caterpillar - Rose- Thrips, scales, leaf eating caterpillars and chafer beetles - Jasmine- Stink bug, bud worm and gall mite - Chrysanthemum- Aphid- IPM practices - Tobacco- Tobacco caterpillar, aphid, whitefly and stem borer - Coffee White borer, red borer and green scale; Tea- Tea mosquito bug, thrips, red spider mite, pink mite, purple mite and scarlet mite- IPM practices.
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12. Establishment of mulberry garden – Planting season and land preparation, preparation of planting material - Irrigation- spacing, varieties, planting inter cultivation, fertilization, irrigation, leaf harvest and leaf yield - Mulberry Planting under rainfed and irrigated conditions - Spacing and preparation of pits, planting, fertilization, inter-cultivation, maintenance, soil moisture conservation and leaf harvest - Pests and diseases of mulberry plants and their management - Rearing house, rearing equipment and appliances-rearing stand, chawki rearing trays, late age rearing trays, paraffin wax coated paper, bird feathers, bed cleaning nets, chop sticks, rubber foam, ant well, mountages, chopping knife, chopping board, feeding basins, disinfection and hygiene in rearing house.

UNIT-IV

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7. Mulberry silkworm races - Grainage centres, brushing of silkworm larvae, young age and late age silkworm rearing - Effect of temperature, humidity, air current and photoperiod - Leaf quality and leaf maturity on larval growth and survival - Feeding of late instars, bed cleaning and bed spacing for IV and V instars
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9. Silk worm diseases- Pebrine- Symptoms, mode of transmission, stages of contamination and intensity, detection and control - Viral diseases- Nucleo polyhedro Virus and Cytoplasmic Polyhedro Virus - Symptoms, prevention and control. Grasserie - Symptoms, source of contamination, prevention and control - Infectious Flacherie - Symptoms, prevention and control - Fungal Diseases- White muscardine- Source of infection, symptoms, prevention and control - Uzi fly – Biology, nature of damage and symptoms and management.
10. Beekeeping- Importance and multiple source of income - Species of Honey bees Rock bee, Little bee, Indian honey bee, European bee and Dammar bee - Bee biology Life cycle - Caste determination in honey bees- Structural adaptations of honeybees.
11. Commercial methods of rearing, – Different types of the hive- Equipment - Smoker, bee veil, gloves, honey extractor, queen gate, queen excluder sheet, drone extruder, drone trap, comb foundation sheet, dummy division board, swarm trap, bee brush, feeder, queen cage and queen cell protector - Colony management in different seasons, winter, summer and rainy seasons.
12. Bee pasturage – Different species of pollen and nectar yielding plants- Honey flow season and dearth period – Communication in bees – Round dance and wag tail dance- Management of bees for crop pollination – Queen bee substance -Honey extraction, testing of honey, honey composition and value, bee wax, pollen, royal jelly, propolis, venom and its uses.

UNIT-V

(6 Hrs.)

8. Enemies of bees and bee brood - Nature of damage and management of Greater wax moth, lesser wax moth, wax beetle, wasps, black ants, birds etc., - Nature of damage and management of honey bee - mites, Acarapis woodi, Varroa jacobsoni and Tropilaelaps clareae.

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14. Important species of pollinators, weed killers, and scavengers and their significance.

References

11. Vasantharaj David, B. and V.V. Rama Murthy (2016). Elements of Economic Entomology, Popular Book Depot, Coimbatore.
12. Butani, D.K. and Jotwani, M.G. 1984. Insects in Vegetables. Periodical Export Book Agency, New Delhi.
13. Butani, D. K. 1984. Insects and Fruits. Periodical Export Book Agency, New Delhi.
14. Ganga, G and Sulochana Chetty, 1997. Introduction to Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi
15. Hisao Aragu 1994. Principles of Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi.
16. Singh, S. 1975. Bee Keeping in India - Indian Council of Agriculture research, New Delhi.
17. Mishra, R.C. 1995. Honey Bees and Their Management in India – Indian Council of Agricultural Research, New Delhi.

- 18.Glover, P.M.1937. Lac cultivation in India. The Indian Lac research Institute, Ranchi
- 19.Abrol, D.P. 2010. Beekeeping: A Comprehensive Guide on Bees and Beekeeping. Scientific publishers, Jodhpur
- 20.Nair, MRGk. 1990. Monograph on Crop Pests of Kerala and their Control. Trissur Directorate of extension, Kerala agricultural University.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Crop Improvement-II (*Fibre, Sugar, Starches, Narcotics, Vegetables, Fruits and Flowers*) and Principles of Seed Technology

Course Code: GPBR312

No. of Hours: 30 Hrs.

Credits: 2

UNIT-I**(6 Hrs.)**

1. Introduction – General breeding objectives – Concepts of breeding self-pollinated, cross pollinated and vegetatively propagated crops - Breeding populations relevance in crop improvement.
2. Fibres - Cotton and Jute- Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
3. Sugars and starches – Sugarcane - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
4. Sugars and starches – Potato and sweet potato - Origin – Distribution of species – wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.

UNIT-II**(6 Hrs.)**

1. Narcotics - Tobacco- Origin – Distribution of species – Wild relatives and forms – breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
2. Vegetables - Tomato and Brinjal - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
3. Vegetables - Chilli and Okra - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.

UNIT-III**(6 Hrs.)**

1. Vegetables-Cucumber, Cabbage and cauliflower - Origin – Distribution of species – wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.
2. Vegetables - Garlic and Onion - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
3. Vegetables - Gourds and Melons- Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.

UNIT-IV

(6 Hrs.)

1. Fruit crops - Banana and Guava - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
2. Fruit Crops-Mango and Papaya - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - seed production technology of varieties and hybrids-Accomplishments.
3. Fruit crops - Lime, Lemons and Apple - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.

UNIT-V

(6 Hrs.)

1. Fruit crops - Pomegranate and Sapota - Origin – Distribution of species – Wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids – Accomplishments.

2. Flower crops - Rose and Jasmine - Origin – Distribution of species – Wild relatives and forms – Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.
3. Flower crops - Chrysanthemum and Marigold - Origin – Distribution of species – wild relatives and forms –Breeding objectives – Major breeding procedures (conventional and modern innovative approaches) for development of hybrids / varieties - Seed production technology of varieties and hybrids - Accomplishments.

References

1. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
2. Phundan Singh. 2006. Essential of Plant Breeding. Kalyani Publishers, Ludhiana.
3. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. Principles and Practice of Plant Breeding. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kalloo, G.1994. Vegetable Breeding. Panima Educational Book Agency, New Delhi.
6. Kumar, N. 2006. Breeding of Horticultural Crops - Principles and Practices. New India Publishing Agency, New Delhi.
7. George Acquaah.2012. Principles of Plant Genetics and Breeding. Blackwell Publishing Ltd., USA.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: VI

Course Title: Post-harvest Management and Value Addition of Fruits and Vegetables

Course Code: HORT381

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(6 Hrs.)

1. Scope and Importance of post-harvest technology of fruits and vegetables- Extent and possible causes of post-harvest losses- Causes of postharvest losses.
2. Pre-harvest factors affecting postharvest quality, maturity, ripening and shelf life of fruits and vegetables – Environmental factors (Temperature, Light, Rainfall, Wind, Relative humidity) – Cultural factors – (Rootstock, Variety, Mineral nutrients, growth regulators, Irrigation, pruning, thinning, girdling) – Maturity – Pest and diseases.

3. Changes occurring during ripening – Ripening definition- Climacteric and non-climacteric fruits – Metabolic changes - Maturation of seeds – Colour – Texture - Changes in carbohydrates- Changes in aromatic volatiles - Changes in organic acids – Fruit abscission – Changes in respiration rate – Development of surface waxes – Changes in tissue permeability.
4. Causes for deterioration of harvested fruits and Vegetables -Respiration and factors affecting respiration rate – Transpiration and factors affecting transpiration - Ethylene –Mechanical damage – Pest and Diseases.

UNIT-II

(6 Hrs.)

1. Postharvest diseases and disorders - Heat, chilling and freezing injury.
2. Harvesting and field handling – Methods of harvesting – Post harvest handling – Pre-cooling - Sorting and grading – Disinfestation – Post harvest treatments (Waxing, Wrapping, de-greening, ripening).
3. Storage – Methods of storage – Traditional storages (In-situ, pit storage, high altitude, clamp storage, wind breaks, cellars, barns, Night ventilation, Evaporative cool storage ZECC) - Improved storage methods (Refrigerated storage, modified atmospheric storage, controlled atmospheric storage, hypobaric storage).

UNIT-III

(6 Hrs.)

1. Value addition – Concept – Scope and importance of fruit preservation in India – Status of fruit preservation in India.
2. Principles and methods of preservation – Principles of preservation – Preservation methods – High temperature, low temperature, drying, filtration, chemicals, food additives, fermentation, carbonation, antibiotics, irradiation etc.
3. Intermediate moisture foods - Jam, jelly, marmalade – Problems in Jam makingimportant considerations and problems in Jelly making- Problems in marmalade making.

UNIT-IV

(6 Hrs.)

1. Preserve, candy – Concepts and Standards – Flow chart for manufacturing of preserve and candy – Problems in preservation of preserve and candied fruits – Glazed fruits/vegetables.
2. Fruit beverages –Fermented (Juices, Ready to serve, Nectar, cordial, Squash, crush, Syrup, Fruit Juice concentrate, Fruit Juice, Powder, Carbonated beverages) and non-fermented beverages (Wine, Champagne, Port, Sherry, Tokay, Muscat, Perry, Nira, Feni, Cider) – Preparation and preservation of unfermented fruit beverages.

3. Tomato processing - Concepts and Standards – Tomato juice – Tomato puree and paste – Tomato sauce/ketchup- Tomato chutney/pickle –Tomato cocktail – Tomato soup – Canned tomatoes.

UNIT-V

(6 Hrs.)

1. Drying/dehydration of fruits and vegetables – Factors affect the rate of drying – Advantages of dehydration over sun drying – Process of drying/dehydration of fruits and vegetables – Spoilage of dried fruits and vegetables - Freezing – Methods of freezing.
2. Canning of fruits and vegetables – Selection of fruits and vegetable - Causes of spoilage of canned foods – Testing for defects - Containers for packing of canned products – Tin containers, glass containers.
3. Packaging of products - Definition – Properties of good packaging material – Different packaging materials for fresh fruits and vegetables for export – Cushioning materials – Purpose – Characteristics of cushioning material.

References

1. Rathore, N.S., Mathur, G.K., Chasta, S.S. 2012. Post-harvest Management and Processing of Fruits and Vegetables. ICAR, New Delhi.
2. Srivastava, R.P. and Sanjeev Kumar. 2002. Fruit and Vegetable Preservation: Principles and Practices. International Book Distribution Company, Lucknow.
3. Giridharilal, G.S., Siddappa and Tondon, G.L. 2007. Preservation of Fruits and Vegetables. ICAR, New Delhi.
4. Mitra, S.K. 2005. Post-Harvest Physiology and Storage of Tropical and Subtropical Fruits. CABI Publishers, Kolkatta.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Diseases of Field & Horticultural Crops & their Management – II

**(Horticultural
Crops)**

Course Code: PATH373

No. of Hours: 15 Hrs.

Credits: 1

UNIT-I

(3 Hrs.)

1. Study of etiology, symptoms, host-parasite relationship and specific management practices of the following diseases.
2. Citrus diseases - Citrus canker, gummosis (Phytophthora and Diplodia), felt, tristeza and greening.
3. Mango diseases: anthracnose, malformation, bacterial leaf spot, powder mildew, sooty mold, red rust and Loranthus.
3. Guava, Papaya, Ber and Sapota diseases –Guava: wilt and anthracnose. Papaya: foot rot, anthracnose, leaf curl and mosaic and powdery mildew. Ber: Powdery mildew. Sapota: Flat limb.
4. Banana and Pomegranate diseases –Banana: Panama wilt, bacterial wilt, Erwinia rhizome rot, Sigatoka, bunchy top, banana mosaic and banana bract mosaic. Pomegranate: Anthracnose and bacterial blight.

UNIT-II

(3 Hrs.)

1. Grapevine diseases – downy mildew, Powdery mildew, anthracnose, Alternaria leaf spot and rust.
2. Apple and Peach diseases –Apple: scab, powdery mildew, fire blight and crown gall Peach: leaf curl.
3. Chillies diseases - Damping off, die-back and fruit rot, Fusarium wilt, powdery mildew, Choanephora blight, Cercospora leaf spot, bacterial leaf spot, mosaic complex and leaf curl.

UNIT-III

(3 Hrs.)

1. Brinjal and Okra diseases –Brinjal- Phomopsis blight and fruit rot, bacterial wilt and little leaf. Okra-Cercospora leaf spot, powdery mildew and Yellow Vein Mosaic.
2. Potato diseases - early and late blight, black scurf, common scab, wart, black leg, brown rot, leaf roll, mosaics, potato spindle tuber.
3. Tomato diseases - damping off, Ralstonia wilt, early blight, buck eye rot and leaf curl, Septoria leaf spot, bacterial canker, root knot, Tomato spotted wilt and mosaic.

UNIT-IV

(3 Hrs.)

1. Crucifers and Cucurbits diseases –Cruciferous vegetables- Club root, white rust, Downy mildew, powdery mildew, Alternaria leaf spot and black rot. Cucurbits: downy mildew, powdery mildew, Cercospora leaf spot, Erwinia wilt and CMV.
2. Betelvine, onion and garlic diseases –Betelvine: Phytophthora root and stem rot, Sclerotial wilt, Fusarial wilt, Anthracnose. Onion and garlic: Smudge, smut, purple blotch, and Stemphylium blight.
3. Beans, Colocasia and Coriander diseases –Beans- anthracnose, rust, Bean common mosaic virus and bacterial blight. Colocasia: Phytophthora blight. Coriander- stem gall.

UNIT-V

(3 Hrs.)

1. Coconut and oil palm diseases –Coconut- Stem bleeding, Ganoderma wilt, bud rot, grey blight and Tatipaka disease. Oil palm - Bunch rot and spear rot. Tea- blister blight Coffee- rust.
2. Turmeric, ginger and mulberry diseases –Turmeric- leaf spot, leaf blotch, rhizome rot Ginger: rhizome rot/soft rot, leaf spot. Mulberry - powdery mildew.
3. Rose- dieback, powdery mildew and black leaf spot. Marigold: Botrytis blight Chrysanthemum- wilt, stunt, Septoria blotch. Jasmine- rust. Crossandra – wilt.

References

1. Dhaliwal, G. S. and Ramesh Arora 2001 . Integrated pest management : Concepts and approaches, Kalyani Publishers Ludhiana.
2. Metcalf, R. L .and Luckman, W. H. 1982. Introduction to insect pest management. W iley inter science publishing, New York.
3. Larry P Pedigo 1991. Entomology and pest management, Prentice Hall of India Private Ltd., New Delhi.
4. Venugopala Rao, N., Umamaheswari T., Rajendraprasad, P., Naidu, V.G and Savithri, P. 2004. Integrated Insect Pest Management. Agrobios (India) Limited, Jodhpur.
5. Chaube, H.S. and Ramji Singh. 2001. Introductory Plant Pathology. International Book Distribution Co., Lucknow. 136.
6. Mehrotra, R.S. 1980. Plant Pathology. Tata McGraw - Hill Publishing Co. Ltd., New Delhi.

7. Singh, R.S. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH Publ. Co.P. Ltd., New Delhi.
8. Vidyasekharan, P. 1993. Principles of Plant Pathology. CBS Publishers and Distributors, New Delhi.
9. Y. L. Nene and P.N. Thaplial, 1993, Fungicides in Plant Disease Control. Oxford and IBH Publishing Co.

SYLLABUS

Subject: Agriculture and Rural Development

Course Title: Agriculture Informatics

No. of Hours: 15 Hrs.

Semester: VI

Course Code: SMCA301

Credits: 1

UNIT-I

(4 Hrs.)

1. Introduction to computers- Advantages- Disadvantages- Applications - Anatomy of Computers- Input / output devices -Memory Concepts - Units of Memory - RAM – ROM – PROM – EPROM - EAPROM - Cache Memory.
2. Operating system - Definition and types - WINDOWS OS – Features – Desktop – Icons etc.
3. Applications of MS-Office - MS- Word - Creating - Editing and formatting a document. 4. MS Word - Features of good word processor - Mail merge – Drop cap- Auto text.Track changes – Equation editor etc.

UNIT-II

(4 Hrs.)

1. MS- Excel - Data presentation, Tabulation – Merging of cells and graph creation - Mathematical expressions.
2. MS- Excel - Data analysis tool pack – Pivot table and graph etc.
3. MS Access – Database - concepts and types - creating database - Uses of DBMS in agriculture.

UNIT-III

(4 Hrs.)

1. MS Access - Objects of data base – Types of fields etc.
2. Internet and World Wide Web (WWW) – Concepts - Components and creation of web.
3. HTML - XML coding.

UNIT-IV

(4 Hrs.)

1. e-Agriculture - Concepts - Design and development - Application of innovative ways to use information and communication technologies (IT) in Agriculture.
2. ICT for Data Collection - Formation of development programmes - Monitoring and evaluation of Programmes - Computer Models in Agriculture statistical weather analysis and crop simulation models – Concepts – Structure - Inputsoutputs files – Limitation - Advantages and application of models for understanding plant processes – Sensitivity –Verification - Calibration and validation.
3. IT application for computation of water and nutrient requirement of crops - Computer controlled devices (automated systems) for Agri-input management - Smartphone mobile apps in Agriculture for farm advises - Market price - Postharvest management etc.

UNIT-V

(4 Hrs.)

1. Geospatial technology – Concepts – Techniques - Components and uses for generating valuable agri-information.
2. Decision support systems – Taxonomy – Components – Framework - Classification and applications in Agriculture - DSS - Agriculture Information/Expert System - Soil Information Systems etc for supporting Farm decisions.
3. Preparation of contingent crop-Planning and crop calendars using IT tools.

References

1. John Walkenbach, Herb Tyson, Michael R. Groh, Faithe Wempen, Microsoft Office 2010 Bible.
2. Bangia, Learning Ms Office 2010.
3. Prof. Satish Jain and M. Geetha, MS-Office 2010 Training Guide.
4. Johnson, Microsoft Office 2010.....on Demand.
5. Kate Shoup, Microsoft Office 2010.
6. Melanie Gass, It's All about You! Office 2010.

7. Nancy Conner and Matthew MacDonald, Office 2010: The Missing Manual.

SYLLABUS

Subject: Agriculture and rural development

Semester: VI

Course Title: Farm Management, Production and Resource Economics-Practical

Course Code: AECO341P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Different methods Computation of depreciation cost of farm assets.
2. Determination of most profitable level of inputs use and output in farm production process.
3. Determination of least cost combination of inputs.
4. Application of equi-marginal returns/opportunity cost principle in allocation of farm resources.
5. Selection of most profitable enterprise combination.
6. Farm holding surveys.

References

1. Bishop, C.E. and W. D. Tousaint. 1958. Introduction to Agricultural Economic Analysis. John Wiley and Sons, London.
2. Heady, Earl O. 1964. Economics of Agricultural Production and Resource Use. Prentice Hall of India, Private Limited, New Delhi

3. S.S. Johl, J.R. Kapur. 2006. Fundamentals of Farm Business Management.
4. Kalyani Publishers, New Delhi.
5. Kahlon, A.S. and Karam Singh. 1965. Principles of Farm Business Management. Kalyani Publishers, New Delhi.
6. Raju, V.T. and D.V.S. Rao. 2006. Economics of Farm Production and Management. Oxford & IBH Publishing Co. Pvt. Limited, New Delhi

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Communication Skills and Personality Development - Practical

Course code: AEXT391P

No. of Hours: 30 Hrs.

Credits: 1

Practical

1. Communication - Meaning and process of communication.
2. Overview of nonverbal communication skills, signs of body language.
3. Nonverbal communication skills - Practicing conscious body postures and movements.
4. Overview of verbal communication skills.
5. Practicing listening and note taking and writing skills.
6. Practicing oral presentation skills.
7. Practicing writing of field diary and lab record - Indexing, footnote and bibliographic procedures.
8. Practicing reading and comprehension of general and technical articles.

References

1. Dangi K.L., S.S. Sisoda, Pravesh Singh Chauhan and Yogita Ranavat. A Text Book of Communication Skills. Agrotech Publications.
2. Mangal S.K. 2016. Essentials of Educational Psychology. PHI Learning Private Ltd., New Delhi.
3. Nirajkumar. 1997. A Genesis of Behavioural Science. Gyan Publishing House, New Delhi.
4. Eric Berne. 1964. Games People Play-The Psychology of Human Relationship. Grove Press Publishers.
5. Thomas Anthony Harris. 1967. I am Ok You are Ok. Harper Publishers.
6. Scott Bill. 1981. Skills of Negotiating.
7. Goleman Daniel. 1995. Emotional Intelligence.

8. Ratan Reddy B and Supriya Reddy. Soft Skills for Professional Excellence.
9. Shivkhera. 2002. You can win. MacMillan Publishing Company. New Delhi.
10. Shivaraman K. 2009. Communication Skills. APH.

SYLLABUS

Subject: Agriculture and rural developments

Semester: VI

Course Title: Rain fed Agriculture, Watershed Management and Principles of Organic Farming-Practical

Course Code: AGRO303P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Climate classification.
2. Rainfall analysis - Mean, standard deviation, variance and CV.
3. Onset and withdrawal of monsoons and determination of length of growing crop season.
4. Study on cropping pattern of different dryland areas.
5. Mapping of dryland areas in India.
6. Interpretation of meteorological data for rainfall variability.
7. Scheduling of supplemental irrigation based on crop ET demand.
8. Critical analysis of rainfall and calculation of wet spells, dry spells, and length of growing season.

References

1. Reddy, S. R. and Prabhakar Reddy, G. 2015. Dryland Agriculture. Kalyani Publishers.
2. Arnon, I. 1972. Crop Production in Dry Regions (Vol.I), Leonard Hill Pub. Co, London.
3. Dhruva Narayana, V.V., Sastry, G.S. and Patnaik, V.S. 1999. Watershed Management in India. ICAR, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development
Course Title: Agricultural Microbiology-Practical
Course Code: AMBE101P
No. of Hours: 30 Hrs.

Semester: VI

Credits: 1

Practical

1. Introduction to microbiology laboratory and its equipments.
2. Microscope- Parts, principles of microscopy, resolving power and numerical aperture.
3. Micrometry-Measurement of size of microorganisms.
4. Methods of sterilization.

5. Bacterial staining procedures-Simple staining - Gram's staining and Endospore staining.
6. Nutritional media and their preparations.
7. Enumeration of microbial population in soil- Bacteria, fungi and actinomycetes.
8. Methods of isolation, purification and maintenance of microbial cultures.
9. Isolation of Rhizobium from legume root nodule.

References

1. Microbiology. Pelczar, J.r., M.J.E.C.S.Chan and Krieg, N.R. (5th Ed.) 2015. McGraw Hill Publishers, New York.
2. Microbiology. Prescott, L.M., Harley, J.P. and Klein, D.A. (9th Ed.) 2014. McGraw Hill Publishers, New York.
3. Brock Biology of Microorganisms.Madigan, M.,Martinko, J.M and Parker, J. (14Ed.) 2015. Prentice hall of India Pvt Ltd., New Delhi.
4. Soil Microbiology: Subba Rao, N.S. (4th Ed.) 2014. Oxford and IBH Publishing Company Pvt. Ltd., New Delhi.
5. Microbiology A Laboratory Manual: James, C and Natile, S. (10th Ed.) 2014. Pearson India Education Services Pvt. Ltd., South Asia.
6. Experiments in Microbiology, Plant Pathology and Biotechnology. Aneja, K.R.2011. New Age International (P) Ltd., Publishers, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Fundamentals of plant biotechnology Practical

Course Code: BICM302P

No. of Hours: 30 Hrs.

Credits: 1

Practical

1. Organization of Plant Tissue Culture Laboratory.
2. Approaches for Sterilization.

3. Preparation of stock solutions of MS nutrient medium.
4. Preparation of MS medium and its sterilization.
5. Inoculation of Explants into the sterilized media.
6. Isolation of Plant Genomic DNA and its spectrophotometric quantification.
7. Demonstration of Agarose gel electrophoresis technique.
8. Demonstration of PCR technique.
9. Separation of DNA by Agarose gel electrophoresis.
10. Study of the parts and functions of different equipments used in Biotechnology.
11. Visit to high tech poly house for a study of factors contributing to plant growth.

References

1. Introduction to Plant Biotechnology by H.S.Chawla.
2. Biotechnology-Expanding Horizons by B.D.Singh.
3. Genetic Engineering by Preeti Joshi.
4. Principles of Gene Manipulation by Primrose and Twyman.
5. Molecular Biotechnology by Bernard R. Glick and Jack J. Pasternak.
6. Lehninger Principles of Biochemistry by David L. Nelson & Michael M. Cox.
7. Molecular Cloning by Sambrook and Russel.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Pest of Horticultural Crops and their Management and Beneficial insects-Practical

Course Code: ENTO331P

No. of Hours: 30 Hrs.

Credits: 1

PRACTICALS

1. Identification of insect pests of Solanaceous and Malvaceous vegetables and their damage symptoms
2. Identification of insect pests of Cruciferous and Cucurbitaceous vegetables and their damage symptoms
3. Identification of insect pests of leafy vegetables, potato, sweet potato, moringa and chilli and their damage symptoms
(Potato and Chillies are Solanaceous crops).

4. Identification of insect pests of mango, cashew, citrus & banana and their damage symptoms.
5. Identification of insect pests of grapevine, pomegranate, sapota, papaya, apple, custard apple, ber and guava and their damage symptoms.
6. Identification of insect pests of coconut, arecanut, cocoa, cardamom, pepper, date palm & oil palm, eucalyptus and neem and their damage symptoms.
7. Identification of insect pests of spices, narcotics (turmeric, betel vine, onion, tobacco & ginger) and ornamental plants (jasmine, rose, chrysanthemum) and their damage symptoms.
8. Identification of economically important mite, nematode (vegetables, citrus, banana and coconut), rodent (coconut) and bird pests of horticultural crops and their management.
9. Acquaintance with silkworm species and small-scale rearing of mulberry silkworm.

References

1. Vasantharaj David, B. and V.V. Rama Murthy (2016). Elements of Economic Entomology, Popular Book Depot, Coimbatore.
2. Butani, D.K. and Jotwani, M.G. 1984. Insects in Vegetables. Periodical Export Book Agency, New Delhi.
3. Butani, D. K. 1984. Insects and Fruits. Periodical Export Book Agency, New Delhi.
4. Ganga, G and Sulochana Chetty, 1997. Introduction to Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi
5. Hisao Aragu 1994. Principles of Sericulture, Oxford and IBH publishing Co. Pvt. Ltd., New Delhi.
6. Singh, S.1975. Bee Keeping in India - Indian Council of Agriculture research, New Delhi.
7. Mishra, R.C. 1995. Honey Bees and Their Management in India – Indian Council of Agricultural Research, New Delhi.
8. Glover, P.M.1937. Lac cultivation in India. The Indian Lac research Institute, Ranchi
9. Abrol, D.P. 2010. Beekeeping: A Comprehensive Guide on Bees and Beekeeping. Scientific publishers, Jodhpur

10.Nair, MRGk. 1990. Monograph on Crop Pests of Kerala and their Control. Trissur Directorate of extension, Kerala agricultural University.

SYLLABUS

Subject: Agriculture and Rural Development

Semester: VI

Course Title: Crop Improvement-II (Fibre, Sugar, Starches, Narcotics, Vegetables, Fruits and Flowers) and Principles of Seed Technology-Practical

Course Code: GPBR312P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Hybridization techniques and precautions to be taken - Floral morphology, selfing, emasculation and crossing techniques in field crops.
2. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Cotton and Jute.
3. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Sugarcane and Tobacco.
4. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Tomato and Brinjal.

5. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Chilli and Okra.
6. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in and Cucumber, Cabbage and Cauliflower.
6. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Garlic and Onion.
7. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Bitter gourd and Water melon.
8. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Banana and Mango.
9. Floral biology, anthesis, pollination, selfing, emasculation and crossing techniques in Papaya and Guava.

References

1. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
2. Phundan Singh. 2006. Essential of Plant Breeding. Kalyani Publishers, Ludhiana
3. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. Principles and Practice of Plant Breeding. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kalloo, G.1994. Vegetable Breeding. Panima Educational Book Agency, New Delhi.
6. Kumar, N. 2006. Breeding of Horticultural Crops - Principles and Practices. New India Publishing Agency, New Delhi.
7. George Acquaah.2012. Principles of Plant Genetics and Breeding. Blackwell Publishing Ltd., USA.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: VI

Course Title: Post-harvest Management and Value Addition of Fruits and Vegetables-Practical

Course Code: HORT381P

No. of Hours: 30 Hrs.

Credits: 1

Practicals

1. Applications of different types of packaging containers for shelf-life extension.
2. Effect of temperature on shelf life and quality of produce.
3. Demonstration of chilling and freezing injury in vegetables and fruits.
4. Extraction and preservation of pulps and juices.
5. Preparation of jam.
6. Preparation of jelly.
7. Preparation of RTS.
8. Preparation of nectar.
9. Preparation of squash.

References

1. Rathore, N.S., Mathur, G.K., Chasta, S.S. 2012. Post-harvest Management and Processing of Fruits and Vegetables. ICAR, New Delhi.
2. Srivastava, R.P. and Sanjeev Kumar. 2002. Fruit and Vegetable Preservation: Principles and Practices. International Book Distribution Company, Lucknow.
3. Giridharilal, G.S., Siddappa and Tondon, G.L. 2007. Preservation of Fruits and Vegetables. ICAR, New Delhi.
4. Mitra, S.K. 2005. Post-Harvest Physiology and Storage of Tropical and Subtropical Fruits. CABI Publishers, Kolkatta.

SYLLABUS

Subject: Agriculture and Rural Developments

Semester: VI

Course Title: Diseases of field & Horticultural Crops & their management-II (Horticultural crops) - Practical

Course Code: PATH373P No. of Hours: 15 Hrs.

Credits: 1

PRACTICALS

Studies of symptoms, Identification and histopathological studies of the following diseases

1. Citrus diseases.
2. Mango diseases.
3. Ber, guava and sapota diseases.
4. Field visits for the diagnosis of crop diseases.
5. Papaya, banana and pomegranate diseases.

6. Grape and Apple diseases.
7. Chilli, brijnal and Bhendi diseases.
8. Field visits for the diagnosis of crop diseases.
9. Potato and tomato diseases

References

1. Rangaswami, G & Mahadevan, K.2001. Diseases of crop plants in India, Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S.2005. Plant Diseases. Oxford & IBH Publications, NewDelhi.
3. Pathak, V.N.2001. Diseases of Fruit crops. Oxford & IBH Publications,New Delhi.
4. Singh, R.S.1999. Diseases of Vegetable crops. Oxford & IBH Publications, New Delhi.
5. Chaube, H.S and V.S. Pundhir, 2012. Crop Diseases & TheirManagement. PHI Pvt.Ltd, New Delhi.

SYLLABUS

Subject: Agriculture and Rural Development
Course Title: Agriculture Informatics-Practical
No. of Hours: 30 Hrs.

Semester: VI
Course Code: SMCA301P
Credits: 1

Practicals

1. Booting of computer and it's shut down - Practicing Windows operating system - Use of mouse -Title bar – Minimum, maximum and close buttons - Scroll bars - Menus and tool bars.
2. Windows explorer- Creating folder - Copy and paste functions - Control panel Notepad -WordPad etc.
3. MS word - Creating a document, saving and editing.
4. Use of options from tool bars – Format - Insert and tools (Spelling and Grammar) - Alignment of paragraphs and text.
5. Creating a table - Merging of cells - columns and row width - Formats etc.
6. MS- Excel - Creating a spreadsheet - Alignment of rows - columns and cells using format tool bar.
7. Entering formula expression through formula tool bar and use of in-built functions Sum – Average – Stdev –Maximum and minimum.
8. Data analysis using inbuilt tool packs test of significance.

References

1. John Walkenbach, Herb Tyson, Michael R. Groh, Faithe Wempen, Microsoft Office 2010 Bible
2. Bangia, Learning Ms Office 2010
3. Prof. Satish Jain and M. Geetha, MS-Office 2010 Training Guide
4. Johnson, Microsoft Office 2010.....on Demand
5. Kate Shoup, Microsoft Office 2010

6. Melanie Gass, *It's All about You!* Office 2010
7. Nancy Conner and Matthew MacDonald, *Office 2010: The Missing Manual*