



CARMEL COLLEGE, MALA

Nationally Re-accredited with 'A' grade (Third Cycle)

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Criteria I

Curricular Aspects

1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

Syllabus of the courses relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

SEMESTER I

Course Code	Title	Type	Credit
HIS 1C01	Method of Historical Research	Core	5

HIS 1C01 - Method of Historical Research

MODULE I: Research Methodology: Major Trends

Social research and historical research-History as Knowledge- Positivism- Scientific Method as applied in history- Heuristics and Hermeneutics- Qualitative and Quantitative Methods- Textual Analysis- Oral traditions- Semiotics and study of symbols- Interdisciplinary research

MODULE II: Research in Practice-I

Formulation of Research problem- Selection of a topic- Research Plan- Research Design- working hypothesis; Collection of data-Primary and Secondary- documents, photographs, relics, oral sources- Repositories- Archives- Museums- Libraries- E'braries- Online Archives.

Field Research- Techniques- Surveys- questionnaires- interviews.

MODULE III: Research in Practice-II

Methods of Documentation- taking notes, précis, paraphrase;

Arrangement of data- card system- files and folders, word processor

Analysis of sources- Textual criticism- Internal criticism and External Criticism- Deconstruction.

Objectivity- subjectivity- Impact of Postmodernism- generalization- Formulation of final argument.

MODULE IV: Exposition

Synthesis- Writing of research Report- Methods of Explanation- verification of hypothesis- Analytical writing; Chapterisation- logical arrangement of chapters; citations- needs- types- Footnotes- End Notes etc.- Styles (MLA, APA etc.) Bibliography- Index, Appendix- Plagiarism and ghost Writing- Plagiarism check.

Writing of Research papers and projects- Editing- copy editing

Reading List

R.J. Shafer, *A Guide to Historical Method*, Dorsey Press, 1983

Marc Bloch, *The Historian's Craft*, Manchester University Press, 2004

E.H. Carr, *What is History?*, Penguin, 2008 (1961)

G.J. Renier, *History: Its Purpose and Method*, Allen and Unwin, 1961

E. Sreedharan, *A Manual of Historical Research Methodology*, Trivandrum, 2007.

L. Cohen and E. Nagel, *Introduction to Logic and Scientific Method*, Simon Publications, 2002

Willaiam Goode and Paul Hatt, *The Methods of Social Research*, McGraw-Hill, 1952.

Michel De Certeau, *The Writing of History*, Columbia University Press, 1988

Jan Vansina, *Oral Tradition as History*, University of Wisconsin Press, 1985

Kate Turabian, *A Manual for the Writers of Research Papers, theses Dissertations*, University of Chicago Press, 2013

Ludmilla Jordanova, *History in Practice*, Bloomsbury, 2006

Keith Jenkins, *Refiguring History, New thoughts on a new discipline*, Routledge, 20003.

-----, *Rethinking History*, 2003

Aron V Cicourel, ed., *Advances in Social Theory and Metodology*, Routledge, 2014

4. The student should get a minimum of 40 % marks in the aggregate and 40% separately for external for pass in the project.
5. There shall be no improvement chance for the Marks obtained in the Project Report.
6. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re- done and the report may be re-submitted along with subsequent exams through the department, as per the existing rule of the University examinations.

19.11 Viva-Voce

At the end of sixth semester candidate shall attend a project based viva voce. The external evaluation of 12 to 15 students per day is to be conducted with one external examiner and one internal examiner. The examiners shall consult each other and award the grades according to the same criteria specified in 19.10 for the award of marks.

19.12. Industrial Visit

The fourth semester students of affiliated colleges shall be taken under the supervision of faculty members to business or industrial units so as to enable them to have first-hand knowledge about the location, layout, managerial functions, H R management or any area of study as per curriculum. Study tour to an industrial/business centre will form part of curriculum. The report submitted by the student in this respect shall be considered as one of the assignments of the course Entrepreneurship Development or any other course in the fourth semester.

UNIVERSITY OF CALICUT

SYLLABUS OF BACHELOR OF COMMERCE DEGREE PROGRAMME UNDER CBCSSUG EFFECTIVE FROM THE 2019-20 BATCH B.COM ADMISSIONS

CORE COURSES

BCMIB01 BUSINESS MANAGEMENT

Lecture Hours per week: 6, Credits-4

Internal – 20, External – 80, Examination 2.5 Hours

Objectives:

- To understand the process of business management and its functions.
- To familiarize the students with current management practices
- To understand the importance of ethics in business
- To acquire knowledge and capability to develop ethical practices for effective management.

Module I

Concepts of Management – Characteristics of management – Schools of management thought
- Management and administration – Management by objectives – Management by

participation – Management by exception – Management by motivation - Functions of management – Planning– Organizing - Departmentation – Delegation (25 Hours, 20 marks)

Module II

Functions of Management:– Motivation: – concept and importance – Contributions of McGregor, Maslow and Herzberg – Leadership – Concept and styles – Leadership traits - Communication – process and barriers – Control – concept - steps – tools – Coordination – Concept, Principles, Techniques. (20 Hours, 15 marks)

Module III

Business Ethics:– Ethics and Morality – Theories of ethics: Teleological theory – Deontological theory –Virtue theory – Types of ethics – Meaning and scope of business ethics - Characteristics – Objectives of Business Ethics - Factors influencing business ethics – Arguments for and against business ethics – Different views of business ethics - The Separatist View, The Unitarian View, The Integration View, Ethical issues in global business. (20 Hours, 20 marks)

Module IV

Corporate Social Responsibility (CSR): Meaning and definition - History of CSR activities – Concept of Corporate citizenship - Need and importance of CSR – Stakeholders of CSR – Steps in the implementation of CSR activities – CSR and business ethics - CSR and corporate governance – CSR initiatives in India. (18 hours, 15 marks)

Module V

Emerging concepts in management – Kaizen – TQM – TPM – MIS – ISO – Change management – Stress management – Fish bone (ISHIKAWA) Diagram – Holacracy - Rank & Yank - 20% time - Gamification - Flexi-working - Business eco system – Logistic management. (13 Hours, 10 marks)

Reference Books:

1. Boatwright. John R: Ethics and the Conduct of Business, Pearson Education, New Delhi.
2. Gupta. CB; Business management, Sultan Chand & sons
3. Koontz, H and Wehrick, H: Management, McGraw Hill Inc, New York.
4. Prasad. LM; Principles and Practicd of Management; Sultan Chand & sons
5. Stoner. AF and Freeman RE; Management; Prentice Hall of India
6. Drucker, Peter, F., Management: Tasks, Responsibilities and Practices, Allied Publishers, New Delhi.
5. R.S Davar; Management Process
6. Rustum & Davan, Principles and Practice of Management.
7. Srinivasan & Chunawalla, Management Principles and Practice.
8. S. V. S. Murthy. Essentials of Management.
9. Stoner, Freeman & Gilbert, Jr.: *Management*, Prentice Hall of India Private Limited, New Delhi.

BC3BO3 BUSINESS REGULATIONS

Lecture Hours per week : 4

Credits : 4

Internal : 20, External : 80

Objective:

- To familiarise the students with certain statutes concerning and affecting business organizations in their operations.

Module I

Business Laws : Introduction – Nature of Business Law – Meaning and definition -Indian Contract Act, 1872: Contract – Definition – Essentials of valid contracts - Classification of contracts – Offer and acceptance – Consideration – Capacity to contract – Free consent –Coercion – Undue influence – Misrepresentation – Fraud – Mistake – Void agreements – Discharge of contract – Breach of contract and remedies – Contingent contracts - Quasi contracts.

25 Hours

Module II

Special Contracts: Contract of Indemnity: Meaning - Nature – Right of indemnity holder and indemnifier – Contract of Guarantee : Meaning – Nature - Rights and liabilities of surety – Discharge of surety from liability – Contract of Bailment and Pledge: Rights and duties of bailor and bailee, pledger and pledgee – Contract of Agency – Creation of agency – Delegation of authority - Duties and liabilities of principal and agent – Termination of agency.

12 Hours

Module III

Sale of Goods Act 1930 : Contract for sale of goods – Essentials of a contract of sale – Conditions and Warranties – Caveat emptor – Sale by non owners – Rules as to delivery of goods – Un paid seller and his rights .

08 Hours

Module IV

The Consumer Protection Act 1986: Objects and scope – Definition of consumer and consumer dispute – Complaint – Goods - Service - Unfair trade practices – Restrictive trade practices - Rights of consumers – Consumer Protection Council – Consumer Disputes Redressal Agencies.

10 Hours

Module V

The Information Technology Act 2000: Scope and extent – Digital signature – Digital signature certificate – Electronic records and governance – Certifying authorities – Cyber crimes – Offences and penalties under IT Act, 2000.

05 Hours

Reference Books:

1. Singh Avtar, The Principles of Mercantile Law , Eastern Book Company, Lucknow.
2. Kuchal M.C, Business Law , Vikas Publishing House, New Delhi
3. Kapoor N.D, Business Law , Sultan Chand & Sons, New Delhi.
4. Chandha P.R , Business Law.
5. S.S. Gulshan, Business Laws.
6. B. Sen and Mitra, Business and Commercial Laws.
7. Chandha P.R, Business Law, Galgotia, New Delhi.
8. Balchandani , Business Laws.
9. Relevant Bare Acts.
10. Government of India, Information Technology Act, 2000
11. Desai T.R. , Indian Contract Act, Sale of Goods Act and Partnership Act , S.C. Sarkar & Sons Pvt. Ltd. Kolkata.

BC3BO4 CORPORATE ACCOUNTING

Lecture Hours per week : 6

Credits: 4

Internal : 20, External : 80

Objective :

- To help the students to acquire conceptual knowledge of the fundamentals of the corporate accounting and the techniques of preparing the financial statements.

Module I

Accounting for Share Capital : Issue, forfeiture and reissue of forfeited shares – Redemption of preference shares including buy-back of equity shares – Issue and redemption of debentures.

15 Hours

Module II

Final Accounts of Limited Liability Companies: Preparation of Profit and Loss Account – Profit and Loss Appropriation Account and Balance Sheet in accordance with the provisions of the existing Companies Act (excluding managerial remuneration).

15Hours

Module III

Accounting for Amalgamation of Companies with reference to Accounting Standards issued by the Institute of Chartered Accountant of India (excluding inter-company

4. William J Stanton, "*Fundamentals of Marketing*", McGraw Hill Publishing Co, New York
5. Lamb. Hair, McDaniel, "*Marketing*", Cengage Learning Inc USA.
6. Rayport, Jeffrey F and Jaworksi. Bernard J, "*Introduction to E-Commerce*", Tata Mc Graw Hill, New Delhi

BC3C03 Human Resources Management

Lecture Hours per week: 4

Credits: 4

Internal: 20, External: 80

Objectives:

- > To familiarize the students with the different aspects of managing human resources in a organization.
- > To equip the students with basic knowledge and skills required for the acquisition, development and retention of human resources.

Module I

Introduction to Human Resource Management—Importance--scope and objectives of HRM. Evolution of the concept of HRM- Approaches to HRM- Personal management Vs Human Resource Management-HRM and competitive advantage- Traditional Vs Strategic human resource management. 15 Hours

Module II

Human resource planning, Recruitment and selection—Job analysis---process of job analysis-job discretion- job specification-- methods of job analysis-- Conventional Vs strategic planning—job evaluation—Recruitment--source of recruitment-methods. 20 Hours

Module III

Placement, Induction and Internal mobility of human resource. Training of employees—need for training-objectives- approaches --methods-training environment- areas of training- Training evaluation. 15 Hours

Module IV

Performance appraisal and career planning. Need and importance- objectives process- methods and problems of performance appraisal- . Concept of career planning –features- methods –uses career development. 15 Hours

Module V

Compensation management and grievance redressal. Compensation planning objectives- Wage systems- factors influencing wage system-. Grievance redressal procedure- discipline- approaches- punishment-essentials of a good discipline system. Labour participation in management.

15 Hours

References:

1. Human Resource Management- Text and Cases-- VSP Rao
2. Human Resource Management – Pravin Durai
2. Human Resource Management—Snell, Bohlander
3. Personal Management and Human Resources—VenkataRatnam .Srivasthava.
4. A Hand Book of Personnel Management Practice—Dale Yolder

BC4C04 QUANTITATIVE TECHNIQUES FOR BUSINESS

Lecture Hours per week: 5

Credits: 4

Internal: 20, External: 80

Objectives:

- > To familiarize student with the use quantitative techniques in managerial decision making.

Module I

Quantitative Techniques - Introduction - Meaning and definition - Classification of Q.T QT and other disciplines -Application of QT in business -Limitations. 05 Hours

Module II

Correlation and Regression Analysis : Meaning and definition of Correlation - Karl Pearson's co-efficient of correlation - Rank correlation - Regression - Types -Determination of simple linear regression - Coefficient of determination. 20 Hours

Module III

Set Theory - Probability: Concept of probability - Meaning and definition - Approaches to probability - Theorems of probability - Addition Theorem - Multiplication Theorem -Conditional probability- Inverse probability- Baye'sTheorem. 15 Hours

Module IV

BC4BO6 CORPORATE REGULATIONS

Lecture Hours per week : 4

Credit:4

Internal : 20, External : 80

Objective :

- To familiarise the students with corporate law and to make them aware of the importance of corporate governance in the management of organisations.

Module I

Introduction to Companies Act 2013: Objects of the Act – Salient features of the Act - Meaning and definition of company – Features – Kinds of companies – Private company - Public company – Associate company – Dormant company - One person company – Small company - Government company - Lifting of corporate veil.

05 Hours

Module II

Formation of Companies : Promotion – Role of promoters – Incorporation – Capital subscription – Commencement of business – Pre-incorporation and provisional contracts. Document of companies: Memorandum of Association – Definition - Contents and alteration - Doctrine of Ultravires – Articles of Association – Definition - Contents and alteration – Distinction between Memorandum and Articles - Constructive notice of Memorandum and Articles – Doctrine of Indoor management – Prospectus – Contents – Statement in lieu of prospectus – Liabilities for misstatement.

20 Hours

Module III

Share Capital : Shares – Kinds of shares – Public issue of shares – Book building - Allotment of shares - Irregular allotment – Issue prices of shares – Listing of shares - Employees stock option scheme - Sweat equity shares - Right shares – Bonus shares - Shares with differential rights – Share certificate and share warrant - Calls - Forfeiture – Surrender of shares – Buyback of shares – De materialisation and re materialisation of shares – Transfer and transmission of shares – Transfer under Depository system.

15 Hours

Module IV

Management of Companies : Board and Governance – Directors: Appointment – Position – Powers - Rights - Duties and liabilities – Qualification – Disqualification – Removal of directors – Key Managerial Personnel – Introduction to Corporate Governance – Need and importance of Corporate Governance – Corporate social responsibility. Securities and Exchange Board of India Act 1992 – Object – Establishment and management of SEBI – Powers and functions of SEBI – Securities Appellate Tribunal (SAT).

Module V

Company Meetings and Winding up : Requisites of a valid meeting – Statutory meeting – Annual general body meeting – Extra ordinary meeting – Board meetings – Resolutions – Types - Company Secretary : Qualification – appointment – duties - Winding up : Meaning – Modes of winding up – Winding up by Tribunal - Members’ voluntary winding up – Creditors’ voluntary winding up – Liquidator: Powers - Duties and liabilities – Consequences of winding up.

15 Hours

Reference Books:

1. M.C. Shukla & Gulshan :Principles of Company Law.
2. N.D. Kapoor : Company Law and Secretarial Practice.
3. Mannual of Companies Act, Corporate Laws and SEBI Guidelines”, Bharat Law House, New Delhi.
4. M.C. Bhandari : Guide to Company Law Procedures.
5. Tuteja :Company Administration and Meetings.
6. S.C. Kuchal :Company Law and Secretarial Practice.
7. Dr. P.N. Reddy and H.R. Appanaiah : Essentials of Company Law and Secretarial Practice, Himalaya Publishers.
8. M.C. Kuchal : Secretarial Practice.
9. Ashok Bagrial : Secretarial Practice.

BC5B07 ACCOUNTING FOR MANAGEMENT**Lectures Hours per week : 4****Credits : 4****Internal : 20, External : 80****Objectives :**

- To enable the students to understand the concept and relevance of Management Accounting.

1. Dr. S.N. Maheswari : Management Accounting.
2. Saxena : Management Accounting.
3. Made Gowda : Management Accounting.
4. Dr. S. N. Goyal and Manmohan : Management Accounting.
5. B. S. Raman : Management Accounting.
6. R.S.N. Pillai and Bagavathi : Management Accounting.
7. Sharma and Gupta : Management Accounting.
8. J. Batty : Management Accounting.
9. Foster : Financial Statement Analysis , Pearson Education.
10. P.N. Reddy & Appanaiah : Essentials of Management Accounting.

BC5B08 BUSINESS RESEARCH METHODS

Lecture Hours per week : 4

Credits: 4

Internal : 20, External : 80

Objective:

- To enable students for acquiring basic knowledge in business research methods and to develop basic skills in them to conduct survey researches and case studies.

Module I

Business Research: Meaning and definition - Features of business research - Theory building - Induction and Deduction Theory - Concept - Operational definition - Variable - Proposition - Hypothesis - Types of business research: Basic and applied - Exploratory - Descriptive and causal - Phases of business research.

10 Hours

Module II

Exploratory Research: Objectives - Methods - Experience survey - Secondary data analysis - Case study - Pilot study by focus group interview - Process of problem definition - Understand background of the problem - Determination of unit of analysis -

Determine the relevant variables and state the research questions - Hypothesis and research objectives.

10 Hours

Module III

Meaning of Research Design: Methods of descriptive and causal research - Survey - Experiments - Secondary data studies and observation - Sampling design: Simple random sampling - Restricted random sampling – Stratified - Cluster and systematic – Non random sampling - Convenient and judgment sampling - Sampling error and non sampling error.

10 Hours

Module IV

Measurement and Scaling: Nominal - Ordinal - Interval and ratio scale - Criteria for good measurement - Reliability and validity - Designing questionnaire - Means of survey data collection - Personal interview - Telephonic mail and internet.

10 Hours

Module V

- A.** Data Processing: Processing stages - Editing - Coding and data entry - Descriptive analysis under different types of measurements - Percentages - Frequency table - Contingency table - Graphs - Measures of central tendency and index number - Interpretation.
- B.** Preparation of Research Report: Format - Report writing stages - Gathering material and data - Make overall format - Make detailed outline - Write first draft – Re write - Final word processing and publishing.

20 Hours

Reference Books:

1. Donald R.Cooper and Pamela S, Schindler: Business Research Methods. Latest Edition, Irwin McGraw- Hill International Editions, New Delhi.
2. John Adams, Hafiz T.A. Khan Robert Raeside, David white: Research Methods for Graduate Business and Social Science Students, Response Books. New Delhi - 110044.
3. Neresh K. Malhotra: Marketing Research, Latest edition. Pearson Education.
4. William G. Zikmund, Business Research Methods, Thomson
5. Wilkinson T.S. and Bhandarkar P.L.: Methodology and Techniques of Social Research, Himalaya.

Semester 5

SEMESTER V									
C. No	Course Code	Course Name	Credit	Marks			Hrs/ wk		
				Int	Ext	Tot	T	P	Tot
5.1	GEC5HR13	BC5B09 Human Resource Management	4	20	80	100	4		4
5.2	SDC5MM17	Media Laws and Ethics	4	20	80	100	4		4
5.3	GEC5LS15	(SO4 B.06) Life Skill Development	4	20	80	100	4		4
5.5	SDC5MM18	Graphics and Animation in Advertising	4	20	80	100	4		4
5.6	SDC5MM19	3D, Scripting and Game Development	5	20	80	100	5		5
5.7	SDC5MM20 (P)	Graphics and Animation in Advertising Lab	4	20	80	100		4	4
5.8	SDC5MM21 (P)	3D Scripting and Game Development Lab	5	20	80	100		5	5
Semester V Total			30			700	21	9	30

GEC5HR13 – BC5B09 HUMAN RESOURCE MANAGEMENT

Course No: 5.1

Course Code: GEC5HR13

Course Name: BC5B09-Human Resource Management

Credits: 4

Hours: 60

Lecture Hours per week: 4 Credits: 4

Objectives:

- ☐ To familiarize the students with the different aspects of managing Human Resource in the Organization and
- ☐ To equip the students with appropriate knowledge and skills required for acquisition, development and retention of Human Resources.

Module I

Introduction – Human Resource Management (HRM) – Concept, Scope, Importance, Objectives & functions of HRM. Personal Management Vs. Human Resource Management: - HR Planning, Recruitment and selection: Manpower planning – concept and objectives, process of manpower planning, methods of manpower planning, conventional vs. strategic planning – Recruitment : meaning, Sources of Recruitment, Modern trends in Recruitment. Selection: – Meaning and Importance- Steps in selection procedure. Interviews – Types of Interviews – Test – types of test, induction, Job changes – transfer, promotions, demotions, separations

20 Hours

Module II

Human Resource Development:- Training – Concept – Need for Training – objectives – Approaches - Methods of Training. – Training Environment – Areas of training – Training Evaluation - Executive Developments – Process and Techniques.

15Hours

Module III

Performance Appraisal and Career planning: – need and importance – objectives – process – methods and problems of Performance appraisal, concept of career planning - features – methods – uses – career development

15 Hours

Module IV

Compensation Management: Compensation Planning – objectives – wage systems – Factors influencing wage system – components of employee remuneration – Basic wage – Dearness Allowance – Bonus -Fringe benefits and incentives.

15 Hours

Module V

Grievance Redressal: Grievance – meaning and causes of grievances, Procedure of grievances handling – Absenteeism -- Discipline –Essentials of good discipline system

10 Hours

Reference Books:

1. Bernardin, John H: Human Resource Management, Tata McGraw Hill, New Delhi 2004.
2. Arthur M, Career Theory Handbook, Prentice Hall Inc, Englewood Cliff.
3. Belkaoui, A.R. and Belkaoui ,JM, Human Resource Valuation: A Guide to Strategies and Techniques, Quarum Books, Greenwood, 1995.
4. Dale, B, Total Quality and Human Resources: An Executive Guide, Blackwell, Oxford.

5. Greenhaus, J.H., Career Management, Dryden, New York.
6. Mabey, C and Salama, G., Strategic Human Resource Management, Blackwell, Oxford.
7. Aswathappa. K, Human Resource Management
8. Subba Rao, Human Resources Management.
9. Michael Porter, HRM and Human Relations.
10. Garry Dessler and BijuVarkkey, Human Resource Management, Pearson 2012
11. Amstrong's Hand book of Human Resource Management, Kogan-Page, 2012

SDC5MM17 - Media Laws and Ethics

Course No: 5.2

Course Code: SDC5MM17

Course Name: Media Laws and Ethics

Credits: 4

Hours: 60

AIMS

1. To provide students with an understanding of the basic legal concepts and press laws.
2. To give an over view of the ethical issues in the current media scenario.

COURSE OUTLINE

Unit 1

Basic Legal concepts - Judicial system in India, fundamental rights; directive principles.

Unit 2

Freedom of the press - evolution of the concept of freedom of the press – freedom of speech and expression in Indian Constitution: article 19 (1) (a) and reasonable restrictions.

Unit 3

Defamation –libel, slander and defenses of media professional;

Unit 4

Press Laws: Official Secrets Act, Press & Registration of Books Act, Copyright Act, Contempt of Court Act, Young Person's Harmful Publication Act, Indecent Representation of Women's Act, Drug & Magic Remedies Act, Working Journalists Act, Wage Boards, Film Certification Rules, Intellectual Property Rights, Privacy and Cyber laws. Right to Information Act.

Unit 5

Media Ethics and Issues - code of ethics for media personnel; Press Council of India; censorship versus self-regulation; privacy versus public good; embedded journalism and sting journalism.

TEXT BOOKS

Books for Reference

1. Naresh Rao & Suparna Naresh, 'Media Laws, an appraisal', Premier Publishing Company, Bangalore.
2. Kundra.S, 'Media Laws & Indian Constitution', Anmol Publications Ltd, New Delhi.
3. Vakul Sharma, 'Handbook of Cyber Laws', Macmillan, 2002.
4. Nirmala Lakshman, 'Writing a Nation, an Anthology of Indian Journalism'
5. Nalinin Rajan, 'Practising Journalism', Sage Publications,
6. Hamid Moulana, 'International Information Flow',
7. Karen Sandars, 'Ethics & Journalism', Sage Publications, Books for Further Reading
8. Aravind Singhal & Everett M. Rogers, 'India's Communication Revolution', Sage Publications
9. Edward S. Herman & Noam Chomsky, 'Manufacturing Consent', Vintage Publications
10. Dr. Jan R. Hakemuldar et.al, 'Principles & Ethics of Journalism', Anmol Publications. 4. Patrick Lee Plaisance, 'Media Ethics', Sage Publications

GEC5LS15 - (S04 B.06) Life Skill Education & Presentation Skill

Course No: 5.3

Course Code: GEC5LS15

Course Name: (S04B.06) Life Skill Education & Presentation Skill

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.

Establish self-management and help to maintain work life balance.

Core Course III
ENGLISH AND COMMUNICATION TECHNOLOGY

Code	Contact Hrs/week	Credit	Semester
FEN3B03	4	4	3

Aims

This course introduces students to all the basic aspects of Information Technology and computers that an educated citizen of the modern world may be expected to know and use in daily life. The topics in the syllabus are to be presented as much as possible with a practical orientation, so that the student is given a perspective that will help him to use and master technology.

Objectives

On completion of the course:

- The student will have a thorough general awareness of Computer Hardware and Software from a practical perspective.
- The student will have good practical skill in performing common basic tasks with the computer

Course Outline

Module I: Computer Hardware

History of the development of computers- Types of computers- PC, Laptop, Net book, Tablet, Workstations – Mainframes – Supercomputers. Different parts of a computer- memory - monitor- CRT and LCD - CPU - processor types. Input/output devices – mouse - keyboard - Printers - scanners - microphones- speakers etc. Ports - USB - Network- Peripheral devices - Modems - Web camera- Bluetooth devices.

Module II: Software

Operating Systems - Windows- Linux- Mac- Android - Software Licenses - Free Software. Office Suites - MS Office - Libre Office - Google Docs - Zoho writer. Windows software tools- MS Word, PowerPoint, Excel – Linux tools – Open Office – Impress. Using Word Processors- formatting text- fonts - arranging pages- printing. Using Presentation Software - making presentations.

Module III: NETWORKING AND THE INTERNET

Networking- LAN- WAN – Wireless networks - Internet- Browsers and Search Engines. Blogs-Email- Chat- Social networking- Video Conferencing. Security Issues- Hacking- Phishing- Computer Virus - Antivirus Tools- Safety of digital data.

Module IV: COMPUTERS AND SOCIETY

English - a language with a global presence on the internet - Knowledge Resources - Google Scholar - E-Gyankosh - Project Gutenberg - INFLIBNET and N-List - Online Dictionaries - Wikipedia and other online encyclopedias - Online libraries, newspapers, journals and magazines.

Websites for learning English- British Council, BBC and ELLLO. E-books and E-book readers. Trends in E-governance- Computer localization - using computers in the local languages in India – Unicode – software tools for typing local language.

Core book

A Wiki Book with the relevant topics in the various modules will be made available.

Evaluation

Internal Assessment	
Item	Marks
Assignment	4
Test papers (2)	8 (4+4)
Seminars	4
Attendance	4
Total	20

End Semester Examination: Question Paper Pattern

No	Question type	No. of Questions	Marks per Ques	Marks	Time (minutes)
I	Objective type	3 bunches of 4 questions each	1	12	15
II	Short Answer	9 out of 12	2	18	45
III.	Short Essay(100 words)	6 out of 10	5	30	60
IV	Long Essay(300 words)	2 out of 4	10	20	60
Total				80	180 mins

Core Course VI

ENGLISH FOR BUSINESS COMMUNICATION

Code	Contact Hrs/week	Credit	Semester
FEN4B06	5	4	4

Aims

- a) To help students to learn the fundamentals of business correspondence.
- b) To get practical knowledge in business correspondence.

Objectives

On completion of this course, students will have:

- a) A comprehensive idea about business correspondence
- b) The ability to prepare business letters, business reports, technical proposal etc.
- c) The tips to improve their speaking skills
- d) A thorough knowledge in the field of proof reading and editing

Course Description ii. Course Details

Module I

- a) Definition, Meaning and Importance of Business Correspondence Meaning - purpose and uses
- b) Common Business terms with usage

Module II

1. Telephonic Skills: Preparing to make a telephone call -Receiving calls- Taking and leaving messages- Asking for and giving repetition- setting up appointments- changing appointments- ending a call- Situational Dialogues
2. Presentation skills: planning and getting started- structure I - the introduction-structure II - The main body-structure III - the end-using visual aids.
3. Meetings: what makes a good meeting- chairing a meeting- stating and asking for opinions- asking for giving clarifications- ending the meeting.

MODULE III

Writing Skills

- a) Business Letters and Resumes: Importance- Elements- Lay out- Elements of Style-Types of Business Letters- Resume Preparation
- b) Business Reports: Definition-Salient features- Significance- Types- Preparation and Planning- Data Collection- Analyzing and organizing the data- Preparing an outline-Structure of Formal Reports- Style of Reports- Preparing a checklist-sample reports
- c) Technical Proposal: Purpose- Importance- Types- Structure

- d) E-mail writing: Introduction- Reasons for popularity- Common pitfalls- Guiding principles for Composition- maintaining Common Etiquette
- e) Maintaining diary – using memory aids – using and asking for testimonials and certificates

Module IV

Other Business writings: Itinerary writing- Inter-office Memorandum(Memo)- Circulars- notice, Agenda and Minutes- Advertising ii) Editing and proofreading: significance- Advantages- Steps involved in the Editing process- Proof reading a document- Standard proofreading symbols iii) Art of condensation: Precis, summary

4. Reading List

Core Text

1. Kumar, Sanjay & Latha, Pushpa. *Communication Skills*. New Delhi: OUP, 2011
2. Blundel, C.A & Middle Miss. NMG. *Career: English for Business and Commercial World*. New York: OUP, 2009
3. RC, Bhatia. *Business Communication*. New Delhi: ANE Books, 2008
4. KK, Lakshmi & KK, Ramachandran. *Business Communication*. New Delhi: Mac Millan, 2007
5. Robins MH & Vidya S. *Communicative Competence in Business English*. New Delhi: Orient Longman, 2007
6. Kitty O Locker & Stephen Kyo. *Business Communication- Building Critical Skills*. New York: McGraw Hill, 2001
7. Sweeny, Simon. *Communicating in Business*. New Delhi: CUP, 2004

Evaluation

Internal Assessment	
Item	Marks
Assignment	4
Test papers (2)	8 (4+4)
Seminars	4
Attendance	4
Total	20

Complementary Course-III
FOUNDATIONS OF AESTHETICS AND CRITICISM

Code	Contact Hrs/week	Credit	Semester
FEN3C03	6	4	3

Aim

To give students an overview of Literary Theory till around 1950

MODULE I-CLASSICAL FOUNDATIONS: WESTERN

Explanation of the following thinkers and concepts sufficient to enable the student to write a 300-word essay on them:

- Plato's concept of art and his criticism of drama and poetry
- Aristotle's concept of Tragedy, Comedy, Plot and *Catharsis*
- Longinus' Concept of the Sublime

Module II -CLASSICAL FOUNDATIONS: EASTERN

Indian Aesthetic Theories of:

- ❖ Rasa
- ❖ Dhvani
- ❖ Vakroti

Module III -EVOLUTION OF ENGLISH CRITICISM

A brief survey of each of the following writers and their main ideas with reference to the main critical texts written by them:

- ❖ EARLY MASTERS
 - Philip Sidney
 - John Dryden
 - Alexander Pope
 - Dr Samuel Johnson
 - William Wordsworth
- ❖ EMERGENCE OF MODERN THEORY
 - Mathew Arnold
 - T.S.Eliot
 - LA. Richards
 - F.R.Leavis

DETAILED STUDY:

T.S Eliot: *Tradition and Individual Talent*

Module IV - A BRIEF SURVEY OF MAJOR LITERARY MOVEMENTS AND POETIC DEVICES

CORE READING:

- ❖ *An Introduction to the Study of Literature-* William Henry Hudson
- ❖ *A Background to the Study of Literature-* B. Prasad

REFERENCE:

- ❖ *Classical Literary Criticism* - Eds. D.A. Russell and Michael Winterbottom
- ❖ *Indian Aesthetics/* Ed. V.S. Sethuraman
- ❖ *Indian Literary Criticism I* Ed. G.N. Devy
- ❖ *The English Critical Texts/* D.J. Enright and Ernest Chickera
- ❖ *Twentieth Century Literary Criticism/* David Lodge
- ❖ *Contemporary Literary Theory: A Student Companion/* N. Krishnaswami and Sunita Mishra

Evaluation

Internal Assessment	
Item	Marks
Assignment	4
Test papers (2)	8 (4+4)
Seminars	4
Attendance	4
Total	20

End Semester Examination: Question Paper Pattern

No	Question type	No. of Questions	Marks per Ques	Marks	Time (minutes)
I	Objective type	3 bunches of 4 questions each	1	12	15
II	Short Answer	9 out of 12	2	18	45
III.	Short Essay(100 words)	6 out of 10	5	30	60
IV	Long Essay(300 words)	2 out of 4	10	20	60
Total				80	180 mins

UNIVERSITY OF CALICUT

Master of Commerce (CSS)

Semester III

MC3C13: RESEARCH METHODOLOGY

80 Hours

Marks: 80

Objectives:

- To acquaint students with process and methodology of research
- To enable students to identify research problems, collect and analyse data and present results.

Module 1: Research: Basic concepts - Meaning – Objectives – Types – Approaches – Significance of research in social sciences – Process of research – Formulating problem – Literature Survey – Hypothesis – Research Design – Types – Exploratory, Descriptive, Diagnostic, Experimental – Sample Design – Collecting, analyzing, testing, interpreting and presenting result.

15 hours

Module 2: Population Survey and Sample Study: Population & Sample – Sampling theories - Techniques of sampling – Random and Non random techniques – Sample Size – Determination of sample size – Sampling Errors – Non sampling Errors – Factors influencing sample size – Optimum sample size – Case Study – Pilot Survey.

20 hours

Module 3: Data collection : collection of Primary Data – Methods of Data Collection – Observation – Field Survey – Questionnaire - Interview Schedule – Preparation of Questionnaire – Process of Interviewing – Collection of secondary data – Sources of secondary data.

10 hours

Module 4: Measurement and Scaling : Variables – Attributes – Process of measurement – Attitude Measurement – Scaling - Scaling Techniques – Graphic Rating – Likert – Thurstone – Semantic Differential – Stapel – Dichotomous – Scales – Types of Scales – Scale Values – Validity and Reliability of Scales – Errors in measurement.

20 hours

Module 5: Data Processing and Presentation : Field Work – Editing – Classification – Coding – Tabulation – Summarization – Analysis of data – One way ANOVA - Univariate, Bivariate and Multi variable methods - Tools of Analysis – Descriptive Analysis – Inferential analysis – Interpretation – Presentation – Report Writing - Types of Reports – Contents of Reports – Format of Reports – Documentation Styles.

15 hours

References:

1. Tandon BC, Research Methodology in Social Sciences, Chaithanya Publishing House
2. Whitney FL, Elements of Research, Prentice Hall o India
3. Ferber R, Research Methods in Economics and Business, Macmillan
4. Deming W Edwards, Sample Design in Business Research, John Wiley
5. Bailey Kenneth D, Method of Social Research, Macmillan
6. Krishna Swamy, Methodology of Research in Social Sciencem Prentice Hall of India.
7. Achalpathi KC, Readings in Research Methodology in Commerce and Business Management, Himalaya Publishing House.

Collins, Randall. 1986 c. Weberian Social Theory. Cambridge: University Press.

Coser, Lewis. 1977, Masters of Sociological Thought, 2nd ed. New York: Harcourt, Brace & Jovanovich.

Delaney, Tim. 2008, Contemporary Social Theory, Investigation and Application. New York Prentice Hall.

Good, Erich. 1988. Sociology, 2nd Edition. Englewood Cliffs, NJ: Prentice Hall.

Judge, Foundations of Classical Sociological Theory, Pearson

Ritzer, George. 1985. 'The Rise of Micro Sociological Theory'. Sociological Theory. Boston: Mc Graw Hill.

Ritzer, George. 2000 d. Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2000 c. Modern Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2003. Contemporary Sociological Theory and its Classical Roots. Boston: Graw Hill.

Turner, Jonathan. H. 2003. The Structure of Sociological Theory. Belmont, CA: Wadsworth.

CORE COURSE

SOC4 B.05 SOCIAL RESEARCH METHODS

No. of credits: 4

Objectives

1. To provide an understanding of fundamentals of social research
2. To discuss the different forms of research and its applications
3. To understand the scientific nature of research and various steps involved in it.
4. To understand various tools, techniques and methods of data collection and to identify their applications in different contexts.
5. To distinguish the characteristics of qualitative and quantitative research.

MODULE I FUNDAMENTALS OF SOCIAL RESEARCH

- I.1. What is research, Purpose of research, Scientific method, Research and theory
- I.2. Social science research: Meaning and Scope, Objectivity in social research
- I.3. Qualitative and Quantitative Research: Historical development and Present Scenario.

MODULE II TYPES AND METHODS OF SOCIAL RESEARCH

- II.1. Types of Research : Basic, Applied and Action Research
- II.2. Qualitative Research Methods: Case study, Content analysis, Narrative, Focused Group Interview.
- II.3 Quantitative Research Method: Social survey

MODULE III STAGES IN SOCIAL RESEARCH

- III.1. Selection and formulation of Research Problem
- III.2. Literature survey and Experience survey
- III.3. Formulation of Hypothesis: Types of Hypothesis
- III.4. Research Designs: Descriptive, Exploratory, Experimental and Diagnostic Designs.

MODULE IV DATA COLLECTION

- IV.1. Types of Data: Primary and Secondary
- IV.2. Sources of Data
- IV.3. Methods of Primary Data collection: Observation, Local correspondents, Interview, Questionnaire, Schedule, Projective techniques
- IV.4. Construction of Questionnaires : Criteria and guidelines.

Reference

Ahuja ,Ram(2001) , Research Methods , Rawat Publications , New Delhi

Claire , S., Marie Jahoda , Morton Duetch and Stuart W.Cooke (1962), Research methods in Social Relations, New York , Colt, Reinehart and Whinstone

IV.2. Tribal issues in Kerala: Landlessness, Poverty

IV.3. Field visit to a Tribal Area

(The seminar presentations in the paper should be based on the field visit. Group presentations based on the different aspects of the socio cultural life of the tribals visited should be assigned grades. Each group should consist of maximum five students. No Member shall be exempted from the presentation. Participation of each member will be considered in the process of evaluation. Grades will be assigned individually on the basis of presentation and participation. These grades would be counted as the grades for seminar presentation as part of the internal assessment)

Reference

Madan and Majumdar, An Introduction to Social Anthropology

Makhan Jha, An Introduction to Anthropological thought

Herskovits M.T, Cultural Anthropology

Leela Dube, Sociology of Kinship

Balbir Singh Negi, Man, Culture and Society

Nadeem Hasnain, Tribal India

Arup Maharatra, Demographic perspectives on India's tribes

K.S. Singh, The Scheduled Tribes

Roy Busman, Tribes in Perspective

Mathur PRG, Tribal situation in Kerala

CORE COURSE

SOC5 B.10 RESEARCH METHODS AND STATISTICS

No. of credits: 4

Objectives

1. To provide basic understanding in social statistics.

2. To provide an understanding of the use of statistical techniques of social research in Project Work.

MODULE I STATISTICAL TECHNIQUES IN SOCIAL RESEARCH

I.1. Statistics - Definition as singular and plural nouns, Scope and uses of statistics

I.2. Use of statistical methods in social research, Limitations of Statistics

MODULE II SAMPLING TECHNIQUES

II.1. Definition and purpose of sampling, Advantages and limitations

II.2. Types of sampling:

a) Probability sampling : Simple Random Sampling, Systematic Sampling, Stratified Sampling, Cluster Sampling

b) Non-probability sampling: Accidental or Convenience Sampling, Purposive or judgment Sampling, Quota Sampling, Snow-ball Sampling

MODULE III DATA MANAGEMENT AND PRESENTATION

III.1. Nature of Statistical Data: Variables and Attributes

III.2. Classification and Tabulation, Construction of Frequency Tables and its components

III.3. Diagrammatical and Graphical representation of data

(a) Dimensional diagrams – bar diagrams, pie diagrams

(b) Graphs – Histogram, Frequency curve, Frequency polygon, Ogives

III.4. Basic Statistical Measures : Central Tendency – Mean, Median, Mode

MODULE IV REPORT WRITING

IV.1. Target audience: Academic community, Sponsors of study and the General public.

IV.2 .Types of report: Synopsis, Research proposal, Comprehensive report for the Academic Community

IV.3. Content of Research report: Introduction, Research design and Data collection,

Data Processing and Analysis , Findings , Summary, Appendices and Bibliography

Reference

Ahuja ,Ram(2001) , Research Methods , Rawat Publications , New Delhi

Claire , S., Marie Jahoda , Morton Duetch and Stuart W.Cooke (1962),

Research methods in Social Relations, New York, Molt, Reinchart and Whinstone

Gupta S.C .and Kapoor V.K.,(1986) , Fundamentals of Statistics, New Delhi, Chand

Misra R.P., (1983), Research Methodology; Hand Book , New Delhi ,Concept

Publishing Co.

Young , P.V.&Schmid.C.F., Scientific Social Surveys and Research , Prentice-Hall of

India Pvt. Ltd.

Goode, W.J., & Hatt ,P.K.(1981) ,Methods in Social Research , McGraw Hill, New York

Bailey Kenneth.D ., (1978) , Methods of Social Research ,Free Press , New York

Kothari , C.R .,(1985) , Research Methodology: Methods and Techniques , New Delhi

Wiley Eastern Ltd.

Krishnaswamy .O ., (2004) , Social Research Methods , New Delhi , Himalaya Pubs.

Lakin, How to Use Statistics, Pearson

Wampold , B.E, and Drew, D.J.,(1990), Theory and Application of Statistics, Mc Graw Hills Inc.

SOC6 B. (PR) 01 PROJECT WORK SEMESTER 5 AND 6

No. of Credits: 2

Specifications of the Project Work

1. Project Work is spread over the two Semesters, 5 and 6 respectively. Submission of the Project Work should be made at the end of the 6th Semester only. The number of credits will be 4 and hours of work in each semester will be 2.
2. The project work may be on any Social Issue/ Social Situation/ Social Problem relevant in Sociological analysis.

MODULE 4**GEORG SIMMEL**

4.1 Formal Sociology, Sociation and Group formation

4.2 Relationships and Social types

4.3 Philosophy of Money

4.4 Modernity - Metropolis

Reference

- Ian Craib - Classical Social Theory
- Raymond Aron - Main Currents in Sociological Thought
- George Ritzer - Sociological Theory
- Ronald Fletcher - The making of Sociology
- Paramjit S Judge - Foundations of Classical Sociological Theory
- Vidya Bhushan and Sachdeva- Fundamentals of Sociology
- Anthony Giddens - Capitalism and Modern Social Theory
- J.Turner et al - The emergence of Sociological Theory
- Irving.M.Zetlin - Ideology and the development of Sociological Theory
- Lewis.A.Coser - Masters of Sociological Thought
- John Hughes et.al - Understanding Classical Sociology: Marx, Weber, Durkheim
- Anderson & Kaspersen - Classical and Modern Social Theory
- Hawthorne, Geoffrey - Enlightenment and Despair

SEMESTER I**CORE COURSE****NO. OF CREDITS: 5****SOC1 C02 RESEARCH METHODOLOGY OF SOCIOLOGY**Objectives

- To familiarise the students with quantitative and qualitative research
- To understand the steps and stages of research
- To inculcate research aptitude in the students

MODULE 1 PHILOSOPHICAL FOUNDATIONS OF SOCIAL RESEARCH

- 1.1 Major Philosophical Orientations – Epistemology, Ontology and Hermeneutics
- 1.2 Scientific Method in Social Science, Nature of Social Reality, Logic of inquiry – Induction and Deduction, Objectivity and Reflexivity in Social Research
- 1.3 Social Research – Nature and Types, Theory building, Theory-research duality, Inter-disciplinary and Multidisciplinary dimensions, Challenges in Social Research
- 1.4 Methods and Methodologies in Sociological Enquiry, Ethical concerns in Social Research

MODULE 2 PROLOGUE TO RESEARCH

- 2.1 Problem Formulation, Review of Literature, Research questions, Objectives, Hypothesis
- 2.2 Concepts, Variables, Conceptual and Theoretical framework
- 2.3 Research Design – Definition, Functions and Types
- 2.4 Proposal, Synopsis and Abstract; Preparation of Research Proposal

MODULE 3 DATA COLLECTION

- 3.1 Techniques of Primary Data collection: Observation, Questionnaire, Schedule and Interview guide, Census and Sample Survey
- 3.2 Sources of Secondary Data: Archives, Census, Survey Reports, Gazetteers, District handbooks, Film and Visual Artifacts
- 3.3 Types of sampling — Probabilistic and Non probabilistic.

MODULE 4 QUALITATIVE METHODS IN SOCIAL RESEARCH

- 4.1 Nature and scope of Qualitative Research Methods; Methodological issues in qualitative research
- 4.2 Methods: Ethnography and Visual Ethnography, Archival Methods, Oral History, Interviews/ Case

UNIVERSITY OF CALICUT

Master of Commerce (CBCSS)

Semester I

MCM1C01: BUSINESS ENVIRONMENT AND POLICY

80 Hours

Credit:4

Objectives:

To familiarise students with the concepts of macro-economic in which a Business organization operates.
To give an idea about the policies of the government and assess their impact on business.

Module I: Business Environment: Meaning & Elements -Components and significance-Scope-political, Economic, Social, Technological, Legal, Cultural and Labour Environment – Trade Unions – Quality Circles – External Factors Influencing Business Environment – Dimensions of International Business Environment –Challenges

15 Hours

Module II: Structure of Indian Economy: Economic Systems-Economic Planning– Planning Commission and NITI Ayog – Public Sector – Changing Role– Relevance – Public Sector Reforms – Public Private Participation – Privatization and Disinvestments – Fiscal Policy – Monetary Policy – Structure of Union and State Budgets – Sources of Revenue – Management of Public Debt. – GST-History and Development in India

20 hours

Module III: Profile of Indian Economy: New Economic and Industrial Policy–Recent Economic & Tax Reforms in India – GST-Land Reforms – Liberalization – Problems of Growth – Unemployment – Poverty – Regional Imbalances – SEZ – Social Injustices – Inflation – Black Money – Lack of Technical Knowledge and Information – Globalization Various Aspects – Consequences.

15 hours

Module IV: Foreign Direct Investment and Institutional Investment: Forms–Policy - FDI in Retail Trade – Problems and Consequences – FEMA – Multinational Corporations Role and Recent Trends – Problems and Consequences – Competition Law-Import& Export Policies- Start-ups- Digital economy- CRYPTO currency, Fin tech

10 hours

Module V: Environment management-Degradation of Natural Environment-Air pollution, Water Pollution, Land Pollution, National Wet land Policy-Madhav Gadgil Committee Report-Kasturi Rangan Report-Global warming-causes &Effects, Climate Change, KYOTO Protocol, Green Financing, Carbon Credit, Environment Protection Act 1986(Basics)-National Green Tribunal Act (Basics) -Consumer Protection Act,1986 (Basics) – RTI 2005(Basics) Salient features of Information Technology Act:2000.

20 hours

References:

1. M. Adhikari: Economic Environment of Business, Sultan Chand and Sons, New Delhi.
2. Ian Worthington, Chris Britton: Business Environment.

3. Francis Cherunilam: Business Environment, Himalaya Publishing House, Mumbai.
4. Claire Capon: Understanding the Business Environment.
5. K.V.Sivayya and VBM Das: Indian Industrial Economy, Sultan Chand Publications, Delhi.
6. David Baron: Business and Its Environment.
7. Panday G.N: Environmental Management, Vikas Publishing House.
8. Raj Agarwal: Business Environment, Excel Publications, New Delhi.

UNIVERSITY OF CALICUT
DEPARTMENT OF COMMERCE AND MANAGEMENT STUDIES
Master of Commerce (CBCSS)
Semester I
MCM1C02 CORPORATE GOVERNANCE AND BUSINESS ETHICS

80 Hours

Credit:4

Objectives:

- *To familiarise the students with the knowledge of corporate ethics*
- *To enable the students to understand the emerging trends in good governance practices.*
- *To create corporate financial reports in the global in the global and Indian context.*

Module-I

Meaning and Definition of Corporate Governance- Evolution of Corporate Governance- Major Stakeholders of a Corporate Body and their goals- Communication mechanism of corporate organisation with stake holders-Objectives Corporate Governance- Principles of Corporate Governance.

15 Hours

Module-II

Theories and Models of Corporate Governance- Conceptual Framework of Corporate Governance- Legal framework of Corporate and administrative framework- regulatory framework of corporate governance in India- SEBI guidelines and clause 49- Reforms in the Companies Act-Secretarial Audit-Class action-NCLT- Insider trading- rating agencies- green governance- shareholders' activism- corporate governance in PSUs and banks- Legislative framework of corporate governance- an international perspective (UK, USA, Australia, China, Russia, South Africa)

20 Hours

Module-III

Various Committees on Corporate Governance- International- Blue riband Committee-Cadbury Committee- Greens burry Committee- Kings Committee- Securities and Exchange Commission Report- Indian; Birla Committee, Narayanamurthy Committee- JJ Irani Committee, Naresh Committee Report. Uday Kodak Committee Report Corporate Reporting Framework- Reporting of Remuneration- Service Contract of Directors- Financial Reporting of the activities of the company asper clause 49 of the Companies and SEBI Act. IFRS- Need- Importance- Significance-Use.

15 Hours

Module-IV

Elements of Corporate Governance- Board of Directors- Executive Directors- Independent Directors- Appointment, Remuneration- Powers, Duties and Responsibilities- Audit Committee- Composition Power and Responsibilities- Statutory Officers- Duties, Board Committees- Responsibilities and Powers- Board meetings- Whistleblowing and Corporate Governance- The Concept of Whistle blowing-Types of

whistle blowers- Whistle blower policy- the Whistle Blower Legislation across countries- Developments in India.

20 Hours

Module-V

Business Ethics- Meaning-scope-Importance-Dimensions-Role of ethics in business-Law ðics-Ethics and values-Important ethical principles in business-The new management philosophy-Ethics in business functional areas-integrity-Sales-HRM-Management of quality. Corporate excellence-corporate culture- Styles &values of management-managing cultural diversity in organisation- Building corporate image-knowledge workers &knowledge mgt.

10 Hours

Suggested Readings:

Books

1. Mallin, Christine A., Corporate Governance (Indian Edition), Oxford University Press, New Delhi.
2. Blowfield, Michael, and Alan Murray, Corporate Responsibility, Oxford University Press.
3. Francesco Perrini, Stefano and Antonio Tencati, Developing Corporate Social Responsibility- A European Perspective, Edward Elgar.
4. Sharma. J.P., Corporate Governance and Social Responsibility of Business., Ane Books Pvt Ltd, New Delhi
5. Jawahar Lal Corporate Financial Reporting Theory and Practice- Taxman
6. Singh S: Corporate Governance-Global Concepts and Practices- Excel Books
7. Robert A.G Monks & Nell Minow: Corporate Governance: Wiley
8. Bob Tricker: Corporate Governance: Principles, Policies and Practices- Oxford University Press.
9. Fernando.AC: Corporate Governance: Principles, Policies and Practices: Pearson Education
10. Indian Institute of Corporate Affairs- Corporate Governance: Taxman
11. Indrajit Dube: Corporate Governance- Lexis Nexis
12. Satheesh Kumar. T.N: Corporate Governance: Principles and Practices: Oxford University Press
13. Ghosh.B.N. Business Ethics and Corporate Governance- Mc Graw Hill Education
14. Robert Cobbaut et al: Corporate Governance: An Institutional approach- Kluwer Law International.

Note: Latest edition of the readings may be used.

Cases-International

1. Bank of Credit and Commerce International – UK
2. Maxwell Communication Corporation and Mirror Group Newspapers (UK)
3. Enron (USA)
4. Anderson worldwide (USA)
5. Vivendi (France), Lehman Brothers (USA)

Cases-Indian

- 1.Satyam Computer Services Ltd
2. Sahara
3. Kingfisher Ltd

(Common governance problems noticed in various corporate failures; policy actions including major codes and standards.

Journal: Chartered Accountant.

UNIVERSITY OF CALICUT
Master of Commerce (CBCSS)
Semester I

MCM1C03: QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

80 Hours

Credit:4

Objectives:

To acquaint students with important quantitative techniques, which enable sound business decision making

To make students learn the process of applying appropriate quantitative techniques for validating findings and interpreting results.

Module 1: Quantitative Techniques: Introduction to quantitative techniques-Qualitative and quantitative approaches-role in decision making – Significance of quantitative decisions – Probability distributions- Discrete & Continuous-Binomial, Poisson, Uniform, Exponential, Normal distributions- Inferential analysis for management – statistical estimation – point estimation – interval estimation – Properties of a good estimator. Confidence intervals for means (a) when σ is known, and (b) when σ is not known. Sample size determination for a mean. Confidence intervals for proportions.

20 hours

Module 2: Hypothesis Testing: One and Two-sample Tests: General methodology of hypothesis testing. One and two-tailed tests. Type I and type II Errors. *One Sample Tests:* Hypothesis testing of means when the population standard deviation is known and when it is not known. Hypothesis tests concerning proportions. *Two-sample Tests:* Tests for difference between means – when population standard deviations are known, and when they are not known. Inferences about difference between two means for matched samples. Testing of difference between two proportions.

15 hours

Module 3 Analysis of variance & Non parametric tests: F-test of equality of variances. One-factor ANOVA (Completely Randomised Model) and Two-factor ANOVA without replication (Randomised Block Model). Chi-square test for independence & Goodness of fit. Sign test, one sample runs test and rank correlation test

20 hours

Module 4: Correlation and Regression analysis: Simple, partial & Multiple correlation, Simple & multiple linear regressions, Co-efficient of Determination

10 Hours

Module 5: Use of Excel and SPSS for quantitative methods (Application level)- Analysis tools - Descriptive statistics and inferential analysis

15 hours

(Theory 30% Problem 70%)

References:

1. Levin & Rubin, Quantitative Approaches for Management, Pearson
2. Anderson, Quantitative Methods for Business Decisions, Thomson
3. Barry Render, Quantitative Analysis for Management, Prentice Hall of India
4. D.V.D. Vohra, Quantitative Techniques for Management
5. Anand Sharma, Quantitative Techniques for decision making, Himalya Publishing House

6. Gupta & Khanna, Quantitative Techniques for decision making, Prentice Hall of India.

7. Gupta SP, Statistical Methods, S. Chand & Sons.

UNIVERSITY OF CALICUT

Master of Commerce (CBCSS)

Semester I

MCM1C04: MANAGEMENT THEORY AND ORGANISATIONAL BEHAVIOR

80 Hours

Credit:4

Module I: Introduction to management –management concept-Historical evolution schools of management thought –Major contributors to management thought- Principles of management-modern techniques in management- Japanese Management System-Korean Management system - Leadership and Management-Theories of Management, Theories of Leadership, Quality circle- TQM- Six sigma-Kaizen- Benchmarking –Core competence-Bottom of pyramid approach-MDP- steps in MDP— - Need for the knowledge of OB – Need for a contingency approach to the study of OB – Emerging challenges and opportunities for OB – the organization as a system – System – System approach to organizational behaviour – Managerial functions – The organization and people.

20 Hours

Module II: Basic psychological process-Perception-Factors influencing perception - Attribution theory – Specific applications in organizations – Learning - Theories of learning – Using learning concepts for self-management – implications for performance and satisfaction – Remembering – Basic motivational concepts – Theories of motivation. HRM approach to managing and controlling performance. Behavioural aspects of Control

15 hours

Module III: Personality–Determinants of personality–Theories of personality–Major personality attributes influencing organization behaviour - Building and maintaining the self-values, attitudes and job satisfaction – Ethical issues in organizational behaviour – Mental and health problems in organizations – role of counselling. Building, leading and managing teams

20 hours

Module IV: Group dynamic and inter group relationships–Characteristics of workgroup – Basic forces of group behaviour – Quality of Work Life-Work Life Balance-Dynamics of effective operating groups – Work group behaviour and productivity - Team management – Styles and skills in leadership and communication – Power and politics in organization – Managing differences and conflicts – managing change – Organization and society.

15 hours

Module: Organisational Culture, Organizational development–Techniques of organizational development Interventions – Grid management – Transactional analysis – Sensitivity training – Process consultancy -Case discussions and analysis. Techniques for managing organisational relationships.

10 hours

References:

1. Fred Luthans: Organisational behaviour

2. Danial C. Fieldman and Hugh Arnold: Managing individual and group behaviour in organization.

SEMESTER II

CORE COURSE

NO. OF CREDITS: 5

SOC2 C 06 RESEARCH METHODOLOGY II

Objectives

- To familiarise with quantitative and qualitative research methods
- To familiarise scaling techniques
- To familiarise the various components and format of report

MODULE 1 MEASUREMENT AND SCALING TECHNIQUES

- 1.1 Measurement in Research, Measurement Scales: nominal scale, ordinal scale, interval scale, ratio scale., Sources of Error in Measurement
- 1.2 Tests of Sound Measurement, Technique of Developing Measurement Tools
- 1.3 Scaling- Meaning, Purpose, Basic problems of Scaling, Establishing validity and reliability of the Scale
- 1.4 Construction of Scales: Bogardus' Social Distance Scale, Thurston's Equal Appearing Interval Scale, Likert's Internal Consistency Scale

MODULE 2 STATISTICS IN SOCIAL RESEARCH

- 2.1 Nature , Use and Limitations of Statistics in Social Research
- 2.2 Measures of Central Tendency: Mean, Median and Mode; Measures of Dispersion: Mean Deviation, Standard Deviation
- 2.3 Correlation-Meaning and types, Karl Pearson's Correlation, Spearman's Rank Correlation; Regression: Meaning and Purpose, Linear regression
- 2.4 Parametric test: t-test, F-test; Non-parametric test: Chi-square Test

MODULE 3 PROCESSING AND ANALYSIS OF DATA

3.1 Classification and Tabulation of data – Tables: Frequency Table and Two way table

3.2 Graphical and Diagrammatic representation of Data : Graphs-Histogram, Ogives ;

Diagrams- Bar Diagram and Pie Diagram

3.3 Data Analysis: Editing, Coding and Classification of Data, Interpretation and Inference

3.4 Use of Computers in Data Analysis

MODULE 4 REPORTING AND ACADEMIC WRITING

4.1 Report Writing – Purpose of reporting, Types: Technical Report, Popular Report

4.2 Format of Report ; Style Manuals: MLA, APA; Referencing , Bibliography and Indexing

4.3 Academic Writing: Significance, Forms: Article, Monograph, Dissertation, Thesis

4.4 Issues of Copyright and Plagiarism, Use of Softwares in Social Research

(For the paper, questions for a total of weightage 10 within the total weightage of 30 will be problem based The problem based questions in Part A, Part B and art C will not exceed 5 weightage respectively.)

References

American Sociological Association (2007). *American Sociological Association Style*

Guide. Becker, Howard S. *Writing for Social Scientists*. 2nd ed.: University of Chicago

- | | |
|----------------------|--|
| Seltiz, Claire et al | - Research Methods in Social Relations |
| Goode and Hatt | - Methods in Social Research |
| Young, Pauline.V. | - Scientific Social Surveys and Research |
| Silverman, David(Ed) | - Qualitative Research |
| Kothari | - Research Methodology |
| Festinger and Katz | - Research Methods in Behavioural Sciences |
| Kerlinger, Fred. N. | - Foundations of Behavioural Research |
| Kothari. C.R. | - Research Methodology- Methods and Techniques |
| Croxton and Cowden | - Applied General Statistics |
| Gupta. S.P. | - Fundamentals of Statistics |
| Black and Champion | - Methods and Issues in Social Research |

CORE COURSE: 2
MICROBIOLOGY, MYCOLOGY, LICHENOLOGY AND
PLANT PATHOLOGY

Semester	Course code	Credits	Hrs/wk	Marks (Ext.+Int.)	Duration of exam
2	BOT2B02T	3	4	60 + 15	2 hrs

COURSE OUTCOMES (COs)

By the end of the course, students are expected to:

1. Understand basics of microbial life and their economic importance.
2. Develop general awareness on the diversity of microorganisms, fungi and lichens.
3. Analyze the ecological role played by bacteria, fungi and lichens
4. Identify plant diseases and find out control measures.
5. Realize the significance of plant diseases as far as crop production is concerned.

DISTRIBUTION OF TEACHING HOURS (18 hrs/semester = 1hr/week)

Sl no	Subject	Theory	Practical	Total
1	Microbiology	12	9	21
2	Mycology	12	14	26
3	Lichenology	4	4	8
4	Plant Pathology	8	9	17
Total		36	36	72

QUESTION PAPER PATTERN & SUBJECT WISE DISTRIBUTION OF MARKS

Type of questions	Microbiology	Mycology	Lichenology	Pathology	Total
2 marks (total 12)	3	4	2	3	Ceiling 20
5 marks (total 7)	3	2	1	1	Ceiling 30
10 marks (total 2)	2				1x10 = 10
TOTAL					60

MICROBIOLOGY

1. Introduction to Microbiology (1hr)
2. Bacteria –Classification based on morphology and staining, ultra structure of bacteria; Bacterial growth, Nutrition, Reproduction. (5 hrs)
3. Viruses – Classification, architecture and multiplication; Bacteriophages, TMV, Retroviruses- HIV, Virioids, Prions. (3 hrs)
4. Microbial ecology – Rhizosphere and Phyllosphere. (1 hr)
5. Industrial microbiology –alcohol, acids, milk products single cell proteins (1 hr)
6. Economic importance of bacteria, Vaccines: importance, mechanism. (1 hr)

PRACTICAL (MICROBIOLOGY)

1. Simple staining

2. Gram staining – Curd, root-nodules
3. Culture and isolation of bacteria using nutrient agar medium (demonstration only)

REFERENCES (MICROBIOLOGY)

1. Alain Durieux (2009) Applied Microbiology, Springer International Edition.
2. Dubey R.C. & D.K. Maheswari (2000) A Textbook of Microbiology, Chand & Co, New Delhi.
3. Frazier W.C. (1998) Food Microbiology, Prentice Hall of India, Pvt. Ltd.
4. Hans g Schlegel. (2012) General Microbiology-Cambridge University Press. Low Priced Indian Edition, Replica Press Pvt. Ltd.
5. Kumar H.D. & S. Kumar. (1998) Modern Concepts of Microbiology, Tata McGraw Hill. Delhi.
6. Pelzar M.J., E.C.S. Chan & N.R. Kreig. (1986) Microbiology McGraw Hill, New York.
7. Prescott, L.M., Harley J.P., Klein D. A. (2005) Microbiology, McGraw Hill, India. 6th edition.
8. Rangaswami, R & C.K.J. Paniker. (1998) Textbook of Microbiology, Orient Longman.
9. Ross, F.C. (1983) Introductory Microbiology. Charles E. Merrill Publishing Company.
10. Schlegel (2008). General Microbiology. Cambridge University press India Pvt Ltd
11. Sharma P.D. (2004). Microbiology and Plant Pathology Rastogi Publication.
12. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

MYCOLOGY

1. General characters and phylogeny of the kingdom Fungi, the concept of anamorph and teleomorph. (2 hrs)
2. General characters, distribution, and biology of the following groups of fungi (8 hrs)
 - a) Mastigomycotina. Type: *Pythium*
 - b) Zygomycotina. Type: *Rhizopus*
 - c) Ascomycotina. Type: *Xylaria, Aspergillus*
 - d) Basidiomycotina. Types: *Agaricus, Puccinia*
3. Economic importance of fungi: medicinal, industrial, agricultural. Fungi as model organisms for research. (1 hr)
4. Ecological importance of fungi: different modes of nutrition (pathogenic/parasitic, saprobic, symbiotic) (1 hr)

PRACTICAL (MYCOLOGY)

1. Micropreparation – Lactophenol cotton blue – Slides of the above mentioned types.

REFERENCE (MYCOLOGY)

1. Alexopoulos C.J., Mims, C.W. and Blackwell, M. (1996) Introductory Mycology, 4th Edn. John Wiley and Sons, New York.
2. Alexopoulos, C.J. and Mims C.W. (1979) Introductory Mycology, 3rd Edition, John Wiley and Sons, New York.

3. Jim Deacon (2007) Fungal Biology, 4th edition, Blackwell publishing, Ane Books Pvt Ltd
4. Mehrotra R.S. and Aneja K.R. (1990) An Introduction to Mycology, Wiley, Eastern Limited, New Delhi.
5. Sethi, I.K. and Walia, S.K. (2011) Text book of Fungi and their Allies, Macmillan Publishers India Ltd.

LICHENOLOGY

1. Introduction: Type of Interaction between the components symbiosis – mutualism. (1 hr)
2. Classification, growth forms, structure, reproduction, economic importance. Type: *Usnea* (2 hrs)
3. Toxicology, Lichens as food, Bioremediation, Ecological indicators, Pollution indicators, Lichen in Soil formation and pioneers of Xerosere. (1 hr)

PRACTICAL (LICHENOLOGY)

1. Identification of different forms of Lichens.
2. *Usnea* : structure of thallus, fruiting body

REFERENCES (LICHENOLOGY)

1. Gilbert, O. (2004) Lichen Hunters. The Book Guild Ltd. England
2. Kershaw, K.A. (1985) Physiological Ecology of Lichen Cambridge University Press.
3. Mamatha Rao, (2009) Microbes and Non-flowering plants. Impact and applications. Ane Books, New Delhi.
4. Sanders, W.B. (2001) Lichen interface between mycology and plant morphology. Bioscience, 51: 1025-1035.
<http://www.lichen.com>
<http://www.newscientistspace.com>

PLANT PATHOLOGY

1. Introduction – Concepts of plant disease, pathogen, causative agents, symptoms (1 hr)
2. Symptoms of diseases: spots, blights, wilts, rots, galls, canker, gummosis, necrosis, chlorosis, smut, rust, damping off. (1 hr)
3. Control measures: Chemical, biological and genetic methods, quarantine measures. (1 hr)
4. Brief study of Plant diseases in South India (Name of disease, pathogen, symptom and control measures need to be studied) (5 hrs)
 1. Citrus Canker
 2. Mahali disease of arecanut
 3. Blast of paddy
 4. Quick wilt of pepper
 5. Mosaic disease of tapioca
 6. Bunchy top of banana
 7. Grey leaf spot of coconut

PRACTICAL (PLANT PATHOLOGY)

Identification of the disease, pathogen, symptoms and control measures of the following:
(drawing not required)

- a. Citrus canker
- b. Mahali disease
- c. Tapioca mosaic disease
- d. Blast of Paddy
- e. Quick wilt of pepper
- f. Bunchy top of banana
- g. Grey leaf spot of coconut

SUBMISSION (PLANT PATHOLOGY)

Students are expected to submit five properly identified Pathology specimens /herbarium during the practical examination of Paper-I held at the end of 4th semester. Diseases mentioned in the syllabus or any locally available common diseases of crop plants can be selected for submission.

REFERENCES (PLANT PATHOLOGY)

1. Agros, G.N. (1997) Plant Pathology (4th ed) Academic Press.
2. Bilgrami K.H. & H.C. Dube. (1976) A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.
3. Mehrotra, R.S. (1980) Plant Pathology – TMH, New Delhi.
4. Pandey, B.P. (1999) Plant Pathology. Pathogen and Plant diseases. Chand & Co., New Delhi.
5. Rangaswami, G. (1999) Disease of Crop plants of India Prentice Hall of India Pvt. Ltd.
6. Sharma P.D. (2004) Plant Pathology Rastogi Publishers.

GEC3CW08 – Creative Writing for TV and Film

Course No: 3.2

Course Code: GEC3CW08

Course Name: Creative Writing for TV and Film

Credits: 4

Hours: 60

COURSE OUTLINE

Unit 1

Creative skills, creativity factors, imagination, and visualization, ability to create, information and creativity, creative thinking, clarity and precision, coherence and logical sequence in writing, the nature and role of intuition. Universalizing the personal experience. Importance of research. Adaptation from literary works, the elements of visual story telling.

Unit 2

The Elements of Scriptwriting: Action, Character, Setting, Theme, Structure. structure, clarity, coherence, flow of ideas: stages of scripting ideas: proposal, treatment, script development, revision of the script.

Unit 3

Choosing the genre: Event/, Drama, Action Adventure, Suspense thriller, Romance, Comedy, Crime/Detective Mystery, Road Movie, Film noir, etc. Logistics: Form, Format, Software, Text, Dialogue, Parentheticals, Plots, exposition, storyline, themes, character, conflict setting, developing characters, character casting, dialogues, storyboard, point of view, setting and pacing, lyrics, music.

Unit 4

Writing for operas –short films, fiction. Docu-fiction. dramas, cinema script, music albums.

Reference

Danny Dover, Erik Dafforn, *Search Engine Optimization (SEO) Secrets*.

GEC3ES09- (EWM1B01)Environmental Science

Course No: 3.3

Course Code: GEC3ES09

Course Name:(EWM1B01) Environmental Science

Credits: 4

Hours: 60

On completion of this course, the student should be able to:

Objectives

- Get a basic idea of environment, environmental resources and their importance.
- Learn the interrelationship between man, society & environment.
- Learn about ecosystem and biodiversity.
- Learn the impact of pollution and role of mankind to eradicate pollution.

Prerequisites

Nil

Course Outline

Unit 1 (6 Hours)

Multidisciplinary nature of environmental studies, Definition, scope and importance, Need for public awareness.

Unit 2 (15 Hours)

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

Unit 3 (12 Hours)

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4 (15 Hours)

Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation, Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 5 (12 Hours)

Environmental Pollution: Definition, Cause, effects and control measures of various pollutions Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Social Issues and the environment. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Environment Protection Act. Public awareness, Human Population and the Environment, Role of Information Technology in Environment and human health.

References:

1. R Rajagopalan, *Environmental Studies*
2. B. B. Singh, *Objective Environmental Sciences*

SDC3MM09 - Digital Video Production

Course No: 3.4

Course Code: SDC3MM09

Course Name: Digital Video Production

Credits: 4

Hours: 60

COURSE OUTLINE

Unit I (12 Hours)

Moving pictures, Terminology, Shot selection, Storyboards, Shot lists

Unit II (12 Hours)

Overview of Premiere, File formats and other settings, The interface, Video and audio tracks, Basic timeline editing, In and Out points, The Trim monitor, Markers, Lift and Extract, Linking and unlinking footage

Unit III (12 Hours)

Output, Camera operation, Transitions, Opacity control, Volume control, Titles and text tools Slates, Movie promos

Unit IV (12 Hours)

Specialized editing tools, Sunc lock and lock track, Changing speed, Freeze frames & frame holds, Subclips ,Using still images, Putting clips into motion, Keyframes, Keyframe Interpolation, Effects basics

Unit V (12 Hours)

SYLLABUS

Third Semester B.Sc. Degree Programme

Complementary Course III: Zoology-III

PHYSIOLOGY, TOXICOLOGY & ETHOLOGY

Code: ZO3C03

(54 hours) (3 hours per week) (Credits - 2)

A. Physiology

36 hrs

- I. Trans membrane transport mechanism (4 hrs)
Structure of Plasma membrane, Fluid mosaic model, Passive & Active mechanisms, vesicular transport.
- II. Nutrition (3 hrs)
Absorption of nutrients, nervous and hormonal control of digestion, importance of fibre in the food, Anorexia, ulcer, obesity starvation and fasting (In brief).
- III. Respiration (4 hrs)
Gaseous exchange, Respiratory pigments, structure and properties of haemoglobin, gas transport, control of respiration, respiratory problem, Hypoxia, Asphyxia, CO₂ poisoning or Cyanide poisoning, respiratory problem of high altitudes, problem of diving mammals, aspirators, artificial ventilation, heart lung machine, smoking and its ill effects.
- IV. Body fluid and circulation (6 hrs)
Blood constituents, Mention agglutination and coagulation of blood, Haemostasis, Haemolysis and Jaundice, Blood transfusion (short notes). Structure and working of heart (in Brief). Electrical and Mechanical properties of Cardiac muscle, Pacemaker and Conducting system of heart. Cardiac cycle and regulation of heart beat. Blood pressure, pulse, cardiovascular problems (brief description). Arterio sclerosis and athero sclerosis, myocardial infarction, hypertension and thrombosis.
- V. Osmoregulation & Excretion (6 hrs)
Osmoconformers, Osmoregulators, Water retention and Conservation in desert forms. Classification of animals based on nitrogen compounds excreted, Ammonotelism, Ureotelism, Uricotelism, Urea cycle. Hormonal control of kidney function, Kidney disorders, renal Hyper tension, Nephritis, Renal failure, dialysis and kidney transplantation (short notes).
- VI. Muscle Physiology (6 hrs)
EM structure of myofibrils and myofilament, contractile proteins different types. Chemistry and mechanism of muscle contraction, Energy supply, muscle twitch tetanus, isometric and isotonic contraction, summation of stimuli, all or none law - fatigue rigour mortis.
- VII. Nerve physiology (7 hrs)

Mention different types of nerve cells, glial cell, giant nerve fibre; neurotrophins excitation, impulse generation and transmission, electrochemical changes. Maintenance of resting potential, Action potential, threshold of stimulus, all or none response, synapsis, and myo neural junctions. Synaptic transmission, neuro transmitters. Scanning - MRI, CT etc.

B. Toxicology

6 hrs

- I. Toxicants and Public health hazards.
- II. Toxic chemicals, Pesticides, Automobile emission, Heavy metals, fertilizers, food additives, xenobiotics, and radioactive wastes.

C. Ethology

12 hrs

Brief accounts of the following topics.

Introduction

- I. History, Scope and Branches of ethology (1 hr)
- II. Innate behaviour (1 hr)
Orientation, taxes and kineses, simple reflexes and instincts, drive and motivation.
- III. Learned behaviour (2 hr)
Habituation, conditioned reflex, trial and error learning, latent learning, imprinting, insight learning
- IV. Patterns of behaviour (2 hrs)
Habitat selection, sexual selection, co-operation, protection, territoriality, aggression, courtship and agonistic behaviour.
- V. Biological clocks/rhythm (1 hr)
Photoperiod, circadian rhythm, migration, navigation and homing instinct, diapause, hibernation, aestivation.
- VI. Communication in animals (1 hr)
- VII. Social organization in mammals. (2 hrs)
- VIII. Proximate factors (2 hrs)
Neurological basis of behaviour, mention hormonal, biochemical, environmental and genetic factors that influence behaviour.

Assignments

Teacher can suggest topics for Assignment / Seminar (**For internal evaluation only**).

Reference

1. Berry, A.K. A Text Book of Animal Physiology. Emkay Publications, Delhi, 51.
2. Chatterjee, C.C. Human Physiology. Medical Allied Agency.
3. Guyton. A.C & Hall. TB of Medical Physiology, Harcourt.
4. Goyal, K.A. & Sastry, K.V. Animal Physiology. Rastogi. Pub.
5. Rastogi, S.C. Essentials of Animal Physiology, Wiley Eastern.
6. Boinlanger, E.G. Animal Behaviour, 1994. ----- Pub.
7. Reena Mather. Animal Behaviour, 1994. Rosthogi Pub.
8. Sharma, P.D. Tolxicology.
9. Purohit, S.S. Ecology, Environment and Pollution, 2003, Agro.

THIRD SEMESTER B. Sc. DEGREE PROGRAMME(Theory)
ZOOLOGY CORE COURSE-III
ANIMAL DIVERSITY – CHORDATA- PART-I
CODE: ZO3B 03T

[TAXONOMY, DIVERSITY, STRUCTURAL ANATOMY AND
ADAPTATIONS OF CHORDATES]

[54 hours] [3 hours per week] [3 credits]

Introduction **[3 hrs]**

Chordate characters [fundamental, general and advanced]; chordates versus nonchordates; diversity of chordates; classification down to subphyla; salient features of each subphylum. Type study with special emphasis to comparing various functional systems (Comparative Anatomy) such as Morphology, Integumentary, digestive, respiratory, circulatory, excretory, nervous and reproductive systems. Also mention the evolutionary significance.

Subphylum 1. UROCHORDATA [Tunicata] **[5 hrs]**

Affinities; add a note on neoteny [paedogenesis]

Classification down to classes

Class: Ascidiacea Type: *Ascidia* [morphology and retrogressive metamorphosis]

Class Larvacea example: *Oikopleura*

Class Thaliacea example: *Doliolum*

Subphylum 2. CEPHALOCHORDATA **[4 hrs]**

Example: *Branchiostoma* [= *Amphioxus*] morphology, primitive, degenerate and specialized features [affinities and systematic position to be emphasized]

Subphylum 3. VERTEBRATA **[3 hrs]**

Division 1. AGNATHA

Characters and examples: *Myxine*; *Petromyzon* [mention Ammocoetous larva]

Division 2. GNATHOSTOMATA

Super class PISCES **[12 hrs]**

Type: Mullet

Classification of Pisces down to orders; salient features of the following groups

Class Chondrichthyes [cartilaginous fishes]

Order Selachii examples: *Scoliodon*, *Trygon*

Order Holocephali example: *Chimaera*

Class Osteichthyes [bony fishes]

Order Crossopterygii [coelacanths] example: *Latimeria*

Order Dipnoi [lung fishes] examples: *Neoceratodus*, *Protopterus*, *Lepidosiren* [Add a note on distribution of lung fishes]

Order Acanthopterygii [spiny-rayed fishes] examples: *Mugil*, *Rastrelliger*

Super class **TETRAPODA**

Class **AMPHIBIA** [14 hrs]

Type: Frog

Classification of Amphibia down to orders with examples [of extant forms only]

Order Apoda examples: *Ichthyophis*, *Uraeotyphlus*

Order Caudata examples: *Necturus*, *Ambystoma*, mention Axolotl

Order Anura examples: *Bufo*, *Rhacophorus*

Mention discovery of *Nasikabatrachus sahyadrensis*

Class **REPTILIA** [16 hrs]

Type: Calotes

Classification of Reptilia down to subclasses; salient features of the following subclasses; mention the given orders with examples

Subclass Anapsida

Order Cotylosauria [stem reptiles] example: *Hylonomus*

Order Chelonia [common turtles, tortoises etc.] example: *Chelone*

Subclass Lepidosauria [= Super order 1. Lepidosauria under Subclass Diapsida]

Order Rhynchocephalia example: *Sphenodon*

Order Squamata examples: *Chamaeleon*, *Ophidia*: *Common poisonous and non-poisonous snakes of Kerala. Ptyas, Typhlops, Naja, Daboia, Bungarus*; identification key for poisonous snakes

Subclass Archosauria [= Super order 2. Archosauria under Subclass Diapsida]

Order Crocodylia examples: *Crocodylus*, *Gavialis*, *Alligator*

Subclass Euryapsida and Subclass Synapsida

Topics for Assignments / Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Migration of fishes
2. Parental care in fishes
3. Parental care in amphibians
4. Snake venom: nature; composition; antivenin; polyantivenins; prophylaxis
5. Accessory respiratory organs in fishes.
6. Economic importance of fishes.

**CORE COURSE III: PRACTICAL- I* C
ANIMAL DIVERSITY –CHORDATA-PART I
(36 hours) (2 hours per week)**

[Students are expected to make sketches with notes, while they study the specimens in the laboratory and field. The Record must carry notes of all specimens, mountings and dissections. Emphasis must be on scientific aspects. The record sheets related to part I and part II must be bound together to get a single Record.]

Section A: Study of the following specimens

FOURTH SEMESTER B. Sc. DEGREE PROGRAMME (Theory)
ZOOLOGY CORE COURSE-IV
ANIMAL DIVERSITY – CHORDATA PART-II
Code: ZO4B 04T

[TAXONOMY, DIVERSITY, STRUCTURAL ANATOMY AND
ADAPTATIONS OF CHORDATES – AVES AND MAMMALS]
[54 hours] [3 hours per week] [3 credits]

(Give a comparative account of various functional systems of the types specified)

Class **AVES**

[27 hrs]

Type: Columba

Classification of Aves down to the orders specified; mention one example each

Subclass Archaeornithes

Order Archaeopterygiformes example: *Archaeopteryx* – brief account

Subclass Neornithes

Super order Palaeognathae [=Ratitae]

Order Casuariiformes example: *Casuarius* [cassowary]

Order Dinornithiformes [=Apterygiformes] example: *Apteryx* [kiwi]

Order Rheiformes example: *Rhea*

Order Struthiorniformes example: *Struthio* [ostrich]

Super order Neognathae [=Carinatae]

Order Galliformes [pheasants, quail, turkeys, grouse] example: *Pavo cristatus*

Order Anseriformes [screamers, water fowls] example: *Anas*

Order Passeriformes [perching birds] example: *Passer domesticus*

Order Piciformes [wood peckers, barbets, honey guides] example: *Dinopium*

Order Coraciiformes [kingfishers & allies] example: *Alcedo*

Order Apodiformes [swifts, humming birds] example: *Micropodus*

Order Strigiformes [owls] example: *Bubo*

Order Cuculiformes [cuckoos, roadrunners, turacos] example: *Eudynamys*

Order Psittaciformes [parrots, lorries, cockatoos] example: *Psittacula krameri*

Order Gruiformes [cranes, rails, coots, bustards] example: *Choriotis*

Order Charadriiformes [plovers, gulls, terns, auks, sand pipers] example: *Tringa*

Order Columbiformes [pigeons, doves, dodos, sand grouse] example: *Columba*

Order Falconiformes [diurnal birds of prey – falcons, hawks] example: *Mylvus*

Order Ciconiiformes [herons, storks, ibis, spoon bills] example: *Ardea*

Order Pelecaniformes [pelicans, cormorants] example: *Pelecanus*

Order Sphenisciformes [Impennae] example: *Aptenodytes* [penguin]

Order Phoenicopteriformes [flamingos] example: *Phoenicopterus*

Add a note on extinct birds: passenger pigeon [*Ectopistes migratorius*], dodo

[*Raphus cucullatus*], pink-headed duck [*Rhodonessa caryophyllacea*], elephant bird

[*Aepyornis*] rediscovery of Jerdon's courser [*Cursorius bitorquatus*]

Class MAMMALIA

[27 hrs]

Type: *Oryctolagus*

Classification of Mammalia down to the orders cited with examples specified

Subclass Prototheria Infraclass Ornithodelphia [egg-laying mammals]

Order Monotremata examples: *Ornithorhynchus* [platypus], *Tachyglossus* [= *Echidna*]

Subclass Theria Infraclass Metatheria [marsupials]

Order Marsupialia examples: *Didelphis* [opossum], *Macropus* [kangaroo]

Infraclass Eutheria [true placental mammals]

Order Edentata examples: *Bradypus* (sloth), *Dasybus* (armadillo) *Myrmecophaga* (spiny ant eater)

Order Pholidota example: *Manis* (pangolin / scaly ant eater)

Order Lagomorpha [rabbits and hares]

Order Rodentia examples: *Funambulus*, *Ratufa*

Order Insectivora examples: *Paraechinus* (hedgehog), *Suncus* (= *Crocidura*)

Order Dermoptera examples: *Cynocephalus* (*Galeopterus* - flying lemur)

Order Chiroptera examples: *Pteropus*, *Pipistrellus*

Order Primates examples: *Loris*, *Macaca*, *Gorilla*, *Pongo*, *Hylobates*, *Homo*

Order Carnivora examples: *Phoca* (seal), *Odobenus* (walrus), *Panthera* sps, *Viverricula indica* [civet]

Order Cetacea examples: *Physeter* (sperm whale) *Delphinus* (dolphins), *Phocaena* (porpoise) *Balaenoptera* (baleen whale)

Order Artiodactyla examples: *Sus scrofa cristatus*, *Gaur*, *Giraffa*, *Hemitragus* [tahr], *Cervus*, *Axis axis* (spotted deer), *Antelope cervicapra* [antelope, black buck]

Order Perissodactyla examples: *Equus caballus* (horse), *Rhinoceros*

Order Sirenia examples: *Trichechus* (manatee), *Dugong*

Order Proboscidea examples: *Elephas maximus indicus* [Indian elephant] and *Loxodonta africana* [African savanna elephant] *Loxodonta cyclotis* [African forest elephant]

Topics for seminar:

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Aquatic mammals and their adaptations
2. Dentition in mammals [adaptations related to food]
3. Endangered mammals of Kerala
4. Flying mammals
5. Migration in birds
6. Flight adaptations in birds
7. Flightless birds

FIFTH SEMESTER B. Sc. DEGREE PROGRAMME (Theory)
ZOOLOGY CORE COURSE –VI
Code: ZO5B 06T
ENVIRONMENTAL BIOLOGY, WILDLIFE CONSERVATION AND
TOXICOLOGY,
[54 hours] [3 hours per week] [3 credits]

Section A: ENVIRONMENTAL BIOLOGY (32 hrs)

- 1. Ecological tools and Techniques** (4 hrs)
1. Sampling of animal populations
- (i) Trapping and collecting various groups of flying insects (aquatic organisms, soil organisms, birds and mammals).
- (ii) Marking of animals
- (iv) Determination of home range and territory
- (v) Estimation of number of animals in population
- (vii) Indirect method of estimating wild animals by their signs and symptoms.
2. Remote sensing.
- 2. Ecosystem and Energetics** (6hrs)
- (a) Definition, scope and branches of ecology, Habitat, Niche, Community, Autecology and Synecology.
- (b) Energy flow and energetics of ecosystem
- (c) Solar energy and photosynthetic and chemosynthetic production
- (d) Energy transformations and energy transfer
- (e) Laws of thermodynamics
- 3. Biogeochemical cycles** (3 hrs)
- Basic types of biogeochemical cycles - Gaseous cycle - carbon and nitrogen cycles; sedimentary cycle
- 4. Limiting factors** (2 hrs)
- Basic concepts - Leibig's law of minimum - Shelford's law of tolerance, combined concept of limiting factors
- 5. Population Ecology** (5 hrs)
- Properties of population - density, natality, mortality, age distribution, biotic potential, environmental resistance and carrying capacity, population growth forms, J and S shaped curves, migration, emigration and immigration
- 6. Community Ecology** (5 hrs)
- Biotic community - definition, characteristics and classification, species diversity, fluctuations, stratification, succession, ecotone and edge effect
- 7. Population interactions** (3 hrs)
- Intraspecific and interspecific associations - Positive and negative interactions: Mutualism, Commensalism, Parasitism, Predation, Competition
- 8. Man and Environment** (4 hrs)
- (a) Sustainable development (in brief)
- (b) Destruction of habitat and its consequences - wetland, paddy fields, mangrove, river encroachment, sand and clay mining, ecological impacts of tourism

Section B: WILDLIFE CONSERVATION (18 hrs)

1. Biodiversity

(12 hrs)

- (a) Introduction: alpha, beta and gamma diversities. Mention Shannon diversity index and Simpson's dominance index.
- (b) Hot spots of biodiversity. Mention hotspots in Indian region (Western ghats and Sreelanka, Eastern Himalayas and Indo Burma)
- (c) Threats to biodiversity (Habitat modification, pollution, poaching, etc.)
- (d) Role of systematics in biodiversity, Extinction of species.
- (e) Natural resources and conservation-Strategeies of conservation, Natural Reserves, Classification of natural resourses.
- (f) Wild life conservation, Wild life (protection Act)1972,Conservation projects. Project Tiger,Elephant,Lion,Crocodile,Dolphins, Swamp deer,Blackbuck and Turtle.
- (g) Endangered fauna and flora.
- (h) Sanctuaries-Thattekkad bird sanctuary&Parambikulam wild life sanctuary, National parks –Eravikulam NP &Silent valley NP and Biosphere Reserves-Nilgiri BR &Agasthyamalai BR
- .
- (i) Mention IUCN categories and Red data book.
- (j) Conservation of biodiversity - in situ and ex situ conservations. Mention conservation of germplasm.

2. Global Strategy for Conservation

(6 hrs)

- (a) Stockholm Conference / Declaration (1972)
- (b) Nairobi Conference / Declaration
- (c) Rio Declaration (Earth Summit, 1992)
- (d) CITES
- (e) Biodiversity Convention of UNCED
- (f) Kyoto Agreement (1997)
- (g) Johannesburg Conference (2002)
- (h) World Summit on Sustainable Development
- (i) UNEP and its major strategies
- (j) Protection of plant varieties and farmer's right Act (2001)
- (k) Biodiversity Act 2002
- (l) Seed Bill 2005
- (m) Wildlife Act 1972 and its Amendments

Section C: TOXICOLOGY (4 hrs)

1. Toxicants and public health hazards

- (a) Toxic chemicals (pesticides, automobile emissions, heavy metals, fertilizers, food additives, xenobiotics, radioactive wastes).
- (b) Indian law of drug and poisons
- (c) Levels of toxicity- Acute, sub acute, chronic, LD 50, LC 50
- (d) Common bacterial poisoning (botulism)
- (e) Behavioural Toxicology

Topics for Assignment/Seminar

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Environmental ethics and legislation
2. Individual responsibilities – Role of Governmental and Non Governmental Organisations in biodiversity conservation
3. Survey of animal poisons
4. Environmental pollution-land, water, sound and radiation

References:

Environmental Biology, Conservation Biology & Toxicology

Alan Beebi and Anne Maria: First Ecology – Ecological Principles and Environmental Issues, 1st edition, Oxford University Press.

Aggarwal, S.K-Foundation course in Biology 2nd edition-Ane's student edition

May R. M. and Mc Lean: Theoretical Ecology – Principles and Applications, Oxford University Press.

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& Forests, Govt. of India.

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[Kerala State Office], Trivandrum.

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Kurian, J. & Nagendran, R.: *Essentials of Environmental Studies*, 1^e, 2003, Pearson Edn.

Perry, A. S. *et al.*: *Insecticides in Agriculture and Environment*. 1998, Narosa.

Purohit, S.S.: *Ecology, Environment and Pollution*, 2003, Agro.

Sharma, P.D.: *Ecology and Environment*. 7^e, 2002-03, Rastogi.

Richard Primack: *Essentials of Conservation Biology*, Sinaur Associates.

Sharma, P.D.: *Toxicology*.

FIFTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)
ZOOLOGY CORE COURSE –VII
Code: ZO 5B 07T
ETHOLOGY, EVOLUTION AND ZOOGEOGRAPHY
[54 hours] [3 hours per week] [3 credits]

Section A: ETHOLOGY (14 hrs)

- 1. Brief history, scope and branches of ethology.** (2 hrs)
- 2. Patterns of behaviour** (5 hrs)
- (a) Innate behaviour (orientation taxes/ kinesis), simple reflexes and instincts, motivation and categories of behavior.
- (b) Learned behaviour - habituation, conditioned reflex, trial and error learning; latent learning, imprinting, insight learning, memory and learning
- 3. Biological clocks / rhythms** (4 hrs)
- Photoperiod, circadian rhythm; migration, navigation and homing instinct; diapause, hibernation and aestivation (in brief)
- 4. Sociobiology** (3 hrs)
- Social group in termites and elephants, pheromones and social behavior. (mention human pheromones also)

Section B: EVOLUTION (32 hrs)

- 1. Introduction:** (2 hrs)
- Concepts of inorganic and organic evolution, History of evolutionary thought: Ideas of evolution during Pre-Darwinian, Darwinian and Post-Darwinian periods. (brief account).
- 2. Course of Evolution:** (6 hrs)
- (a) **Origin of life:** i) Theory of abiogenesis ii) Theory of biogenesis iii) Theory of special creation iv) Theory of Panspermia and v) Biochemical origin of life - Modern hypothesis – Oparin-Haldane Theory . Major steps in the biochemical evolution of the life (brief account): Origin of Earth and the primordial atmosphere, formation of organic molecules, formation of macromolecules or polymers, and formation of coacervates, microspheres, protocells and full fledged living cells. Experimental evidence for biochemical origin of life: Urey- Miller experiment. Other experiments , Modern ideas on the origin of life.
- (b) **History of Life on Earth:** Geological time scale (simple chart), mention Cambrian explosion.
- (c) **Fossils, Fossilization and Dating of fossils** (brief account).
- (d) **Living fossils:** mention common features and examples.
- 3. Evidences of Organic Evolution:** (5 hrs)
- i) Morphological and anatomical evidences: Homologous, analogous and vestigial structures and their evolution. ii) Physiological and biochemical evidences: examples. iii) Embryological evidences: examples, Biogenetic Law. iv) Palaeontological evidences: Kinds of fossilization, formation of sedimentary rocks, determination age of rocks and fossils, conclusion drawn from fossil records (brief account). v) Taxonomical evidences: evolution based principles of classification, mention phylogenetic tree.

4. Theories of Evolution: (5 hrs)

Lamarckism: Explanation of the major postulates of the Lamark's theory with examples, Criticism against Lamarckism, Neo-Lamarckism, Present status of Lamarckism. **Darwinism:** Explanation of important postulates of Darwin's theory, Examples for natural selection, Criticism against Darwinism, Neo-Darwinism (Synthetic theory of evolution).

5. Modern Concepts of Evolutionary Process: (3 hrs)

Genetic basis of evolution: i) Mutations (gene and chromosomal mutations brief account), ii) Variations: somatic or environmental variations and genetic or hereditary variations, iii) Hardy-Weinberg Principle: Hardy-Weinberg Equilibrium, Factors that upset Hardy-Weinberg Equilibrium, iv) Genetic drift: effects on population, Bottleneck effect and Founder effect, genetic drift and natural selection, importance of genetic drift in evolution; Theory of Punctuated equilibrium and its relevance.

6. Nature of Evolution: (3 hrs)

Species and Speciation: Species concept: Morphological and biological species concepts, General characteristics and subdivisions (sub species, semispecies, sibling species, cline and deme) of species; Speciation: Types of speciation-i) Phyletic speciation (autogenous and allogeous transformations) ii) True speciation (Instantaneous and gradual speciation [allopatric and sympatric speciation]).

7 Isolation and Isolating Mechanisms:

(3hrs)

Types of isolating mechanisms i) Geographic isolation: mention examples, ii) Reproductive isolation (a) Prezygotic isolation (habitat, seasonal, ethological, morphological, physiological and cytological isolation with examples.), (b) Postzygotic isolation (hybrid inviability, hybrid sterility and F2 breakdown isolation with examples.).

8.Adaptive Radiation (Divergent Evolution): cause and significance, adaptive radiation in Darwin's finches.

Convergent Evolution: mention examples.

Pre-adaptation: mention examples.

9. Evolution of Vertebrate Groups: (2 hrs)

Evolution of agnathans, fishes, amphibians, reptiles, birds and mammals (brief account).

10. Evolution of Modern Man: (3 hrs)

Evolutionary trends in humans, Ancestors of Primates, Apes-the closest relatives of man, Fossil ancestors of man: *Dryopithecus*, *Australopithecus* (The Man-Ape of Africa), *Homo habilis* (The Handy Man), *H. erectus*, *H. neanderthalensis* (Neanderthal man), The Cro-magnon, *Homo sapiens* (Modern man); Socio-cultural evolution (brief account).

Section C: ZOOGEOGRAPHY (8 hrs)

1. Animal Distribution

(4 hrs)

- (a) Geographic distribution of animals - cosmopolitan distribution, discontinuous distribution, bipolar distribution and isolated distribution
(b) Factors affecting animal distribution; Barriers to animal distribution - Physical barriers (topographical and climatic); biological barriers.

2. Zoogeographical realms

(2 hrs)

Zoogeographical regions with specific fauna (fauna regions): Palaearctic region, Oriental region, Australian region, Ethiopian region, Nearctic region and Neotropical region; insular fauna; Mention continental and oceanic islands.

3. Biogeography of India

(2 hrs)

Biogeographical zones of India

Trans Himalayan zone; Himalayan zone; Desert zone; semiarid zone; Western Ghats zone; Deccan plateau zone; Gangetic plain zone; North east zone. Coastal zone; Islands present near the shore line.

Topics for Assignments / Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Historical aspects of evolution - Inorganic and Organic
2. Fossils and fossilisation
3. Evolution of horse
4. Polyploidy and Evolution

REFERENCES

For Ethology & Evolution

- Susantha Goonathilake: Merged Evolution – Gordon and Breach Publishers.
Andrews, M.I. & Joy, K.P.: *Ecology, Evolution & Zoogeography*. S.M. Book Depot, Changanassery.
Boulenger, E.G. *Animal behaviour*, 1994, Atlantic Pub. & Distributors
Darwin, C.: *The Origin of Species*, 6e. OUP.
Desmond Morris, 1990. *Animal Watching* (Field guide), Crown Pub Co., London.
Dobzhansky, Th.: *Genetics and the Origin of Species* 1951, Columbia Uty. Press.
Dobzhansky, Th. *et al: Evolution*, Surjeet Pubn., Delhi. *India and South East Asia*. CBS Pubs., New Delhi.
Gamow, George (1970) *The Creation of the Universe*, Bantan Books, New York
Gott, V (1977) *The Amazing but Knowable Universe*, Progress publishers, Moscow

CORE COURSE XVII: PRACTICAL III*B
REPRODUCTIVE BIOLOGY AND DEVELOPMENTAL BIOLOGY
(36 hours) (2 hours per week)

1. Demonstration of chick blastoderm
2. Induced ovulation in fish
3. Study of life cycle in *Drosophila*

Spotters

Types of eggs (Insect, amphioxus, frog, chick, and human)
Cleavage in frog (use slides / diagrams/models)
Shark - Yolk sac placenta
Frog- Blastula, gastrula, neurula
Chick – 18, 24, 32, 48 hours of incubation
Mammal - Any two mammalian embryos
Larval forms of invertebrates (any five) and vertebrates (any two)

SIXTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)
ZOOLOGY Core Course XIV
Code: ZO6B 14T
BIOTECHNOLOGY, MICROBIOLOGY AND IMMUNOLOGY
(54 hours) (3 hours per week) (3 credits)

Section- A: BIOTECHNOLOGY (18 hrs)

1. **Definition and brief introduction of Biotechnology** – Mention branches of Biotechnology (brief). **(2 hrs)**
2. **Fundamentals of animal cell culture and hybridoma technology:** Primary cell culture, secondary culture, types of cell lines, valuable products from cell culture, hybridoma technology, monoclonal antibodies and their uses . **(3 hrs)**
3. **Gene cloning and DNA sequencing:** Introduction, cloning vectors (plasmid, pBR322, phages, cosmids, virus, YAC), Enzymes of rDNA technology (Exonuclease, Endonuclease, Restriction enzyme, DNA ligase, DNA polymerase, Reverse transcriptase)
Use of Linkers
Construction of Recombinant DNA, DNA sequencing (brief) **(4 hrs)**
4. **Transgenic organisms:**
 - (a) Transfection methods: Calcium phosphate precipitation, Dextran mediated, Lipofection, Electroporation, Retroviral infection, micro injection, Shotgun method (brief)
 - (b) Transgenic animals: Fish, sheep, rabbit, mice, and goat. 1 example from each
 - (c) Molecular pharming and bioreactors
 - (d) Mention knock out mice, Bt cotton **(3 hrs)**

5. Molecular markers – RFLP, RAPD, VNTR Micro satellites or STR, and their uses. Chromosome walking, Fluorescence in situ hybridization (FISH) and DNA Finger printing (Profiling) techniques. **(3 hrs)**

6. Biotechnology and Environment:

Biosensors, Bioremediation – Ex situ and in situ
Biofiltration , Bioleaching (microbial mining)
(2hrs)

7. The ethical and social implications of genetic engineering. **(1 hr)**

Section-B: MICROBIOLOG Y (18 hrs)

1. Introduction and scope of microbiology. **(1 hr)**

2. Survey of Microorganisms (outline only)

(3 hrs)

Prions, Viroids, Viruses, Rickettsias, Mycoplasmas, Bacteria,
Cyanobacteria, Prochlorophyta, Protozoa, Algae, Fungi and Slime moulds

3. Structure of a typical bacterium: **(3 hrs)**

Characteristics and major groups of bacteria, growth phases, measurement of growth

4. Viruses: Structure and shape **(2 hrs)**

5. Basic methods in Microbiology: **(4 hrs)**

Microscopic methods, Techniques of sterilization, Media preparation, Isolation and inoculation, Direct observation and Staining techniques, Maintenance and preservation of cultures

6. Microorganisms in Industry: **(2 hrs)**

Products of industrial fermentations, Citric acid, Lactic acid, Amino acids, Enzymes, Vitamins, Antibiotics, Single cell protein, Steroids etc.). Effects of environment on microbial growth (Temperature, Atmosphere, pH and Osmotic factors

7. Microorganisms in Human Diseases: **(3 hrs)**

Normal micro flora of the human body, Diseases caused by Bacteria, Protozoa, Virus (brief). Epidemiology and control of diseases, chemotherapy

SIXTH SEMESTER B.Sc. DEGREE PROGRAMME (Theory)
ZOOLOGY ELECTIVE COURSE
Code: ZO6B 15(E)02T
AQUACULTURE, ANIMAL HUSBANDRY & POULTRY SCIENCE
(54 hours) (2 hours per week) (3 credits)

A. AQUACULTURE

1. Introduction, its scope in India and Kerala, Export potential, Different types of cultures. **(2 hrs)**
2. Mariculture **(3 hrs)**
 - (a) Prawn culture: Important culture varieties, Pokkali culture, breeding spawning, control breeding, induced maturation, eye stalk ablation, culture methods, freezing, curing and canning.
 - (b) Mussel culture: *Perna indica*, *Perna viridis*, Seed collection, artificial seed production, induced spawning, rearing, raft culture, harvesting.
3. Pisci culture
 - (a) Egg collection, induced spawning, construction, preparation and maintenance of ponds, manuring, feeding and harvesting, cryo preservation of fish germplasm, semen bank and preservation media. **(4 hrs)**
 - (b) Biology and culture of Indian major carps – *Catla catla*, *Labeo rohita*, *Cirrhina mrigala*. **(2 hrs)**
 - (c) Biology and culture of Exotic carps. Eg: *Hypophthal michthys molitris* – (Silver carp). **(1 hr)**
 - (d) Inland fishes and Fisheries – eg: *Channa*, *Clarius* - Rivers, Paddy fields, Utilisation of sewage in fish culture. **(3 hrs)**
 - (e) Genral account and fishery aspect of sardine, shark, tuna. **(3 hrs)**
 - (f) Ornamental fisheries – common aquarium fishes, aquarium management and identification of sex. eg: *Carassius auratus* (Gold fish), *Peterophyllum* sps., *Astronotus ocellatus* (Guppy) – *Lebister reticulatus*. **(2 hrs)**
4. Plankton and Fishery production – Zoo and Phytoplankton – Vertical migration – Plankton and Productivity. **(2 hrs)**
5. Fishing Gears: Gill net / drift gill net, purse-seines, harpoon, Chinese dipnets, echo sounders, sonar, remote sensing. **(3 hrs)**
6. Fish Spoilage and Preservation – Biochemical changes, spoilage, use of ice, freezing, canning, dehydration, salting, smoking. **(4 hrs)**
7. Fish utilisation **(4 hrs)**

Nutritive value, bye products, liver oil, body oil, fish meal, fish flour, Isin glass, glue, skin, fin soup, lime, chitin, chitosan.
8. Diseaes and parasites of Fish – Fungal infection – by – Saproleginia – Bacterial – Fin & tail rot disease, Dropsy. **(2 hrs)**
9. Mud banks of Kerala coast **(1 hr)**

B. POULTRY SCIENCE:

Introduction and Scope

(a) Egg production, cable bird production, nutritive value, bye products. **(6 hrs)**

(b) Different breeds – Exotic – 3 examples.

Indigenous – 2 examples.

(c) Poultry rearing : Selection of eggs, hatching, incubation, brooding, sexing, vaccination.

Poultry housing: Free range system, Semi-intensive system (deep litter system and individual cage system).

Equipments for feeding: Nutrients for starting, growing, laying hen.

Common poultry feeds, food rations, and feed formulation.

Common diseases of poultry (Ranikket, Pullorum, Fowl pox).

C. ANIMAL HUSBANDARY

(6 hrs)

Introductin: history, origin, domestication.

Breeds of cattle:

Milk type : Sindhi, Gir

Draft breed: Nagori & Kangayam

Duel purpose: Ongole, Hariana

Exotic breed : Jersey, Holstein – Friesian

Native breeds: Conservation programmes, Vechur cow.

Feeding: Common cattle feeds, fodder

Common diseases : Anthrax, Foot & Mouth disease. Parasites.

Meat hygiene: Slaughter and clean meat production – Zoonotic diseases.

D. DAIRY SCIENCE

(4 hrs)

Role of dairy development in rural economy employment opportunities, white revolution.

Dairy processes: Staining, Filtration, Cooling, Chilling, Clarification, Pasteurisation, Freezing, Recombined milk, Soft curd milk, Skimmed and toned milk.

Artificial milk, Milk – adulteration.

Topics for Seminar / Assignment / Discussion

1. Role of physical and chemical factors in aquaculture.
2. Fish weed organism: Sea weed culture. eg: Grassilaria, Sargassum.
3. Dairy products, manufacture and nutritive value.

References:

1. Banerji, G.C. : A text book of Animal husbandry, 1998. Oxford & IBH.
2. Banerji, G.C. Poultry, Oxford & IBH.
3. P.R. Venkitaraman: Economic Zoology.
4. V. Sudheeran: Economic Zoology.
5. Kurian C.V., Sebastian C.V. : Prawn and Prawn fisheries in India, Hindustan Publication Corporation of India.
6. Alikunhi, K.R. : Fish culture in India, KAV, ICAR.

ELECTIVE COURSE PRACTICALS- XVII

ELECTIVE COURSE PRACTICAL- III*D

36 Hours 2 Hours per week

Aquaculture, Animal husbandary and Poultry Science

1. Culture of fish food organisms: protozoans, rotifers and crustaceans.
2. Maintenance of spawn and its transportation to hatching or rearing tanks.
3. Identification of major food fishes (fresh water, estuarine and marine).
4. Study of different crafts and gears.
5. Study of aquarium and aquarium fishes / ornamental fishes.
6. Breeding techniques: preparation of hormone extracts and injection of hormones to fishes; eyestalk ablation in prawns.
7. Study of fish products and byproducts.
8. Identification of larval forms of prawn, pearl oyster, mussel, lobster and crab.
9. Identification of major edible crustaceans and mollusks.
10. Identification of edible sea weeds.

SYLLABUS

First Semester B. Sc. Degree Programme

Complementary Course I: Zoology-I

ANIMAL DIVERSITY & WILD LIFE

Code: ZO1C01

(36 hours) (2 hours per week) (Credits - 2)

A. Animal Diversity

30 hrs

The study of animal diversity is based on types with emphasis on structural organisation and classification down to classes with examples.

I. Type for detailed study -- 18 hrs

1. *Panaeus* (6 hrs)

Morphological features, Appendages, Digestive system & feeding and digestion, Respiratory system and mechanism of respiration, Blood vascular system, Excretory system, Nervous system, Sense organs (statocyst, compound eye), Reproductive system

2. *Oryctolagus* (12 hrs)

Morphology, Vertebral column (typical vertebra, Atlas, Axis, Thoracic vertebra, Fore limb, Pectoral girdle, Hind limb, Pelvic girdle), Digestive system and mechanism of digestion (mention about dentition, digestive glands & coprophagy), Respiratory system and mechanism of respiration, Structure of Heart and its working and regulation of heart beats, Brain, Eye, Ear, Urinogenital system)

II. Classification --- 12 hrs

An outline of 5 kingdom classification.

Kingdom: *Protista*: Salient features, classification including sub kingdom. Names only. Special reference on sub kingdom with salient features Eg:- *Noctiluca* & *Vorticella*.

Kingdom Animalia (Only salient features, mention classes)

Phylum Porifera Eg: *Leucosolenia*

Phylum Coelenterata Eg: *Obelia*

Phylum Platyhelminthes Eg: *Fasciola*, *Schistosoma*

Phylum Aschelminthes Eg: *Ascaris*

Phylum Annelida Eg: *Arenicola*, *Hirudinaria*

Phylum Arthropoda Eg: *Limulus*, *Peripatus*, *Sacculina*, *Eupagurus* & *Belostoma*

Phylum -Mollusca Eg: *Chiton*, *Perna*, *Teredo* & *Sepia*

Phylum Echinodermata Eg: *Asterias* & *Holothuria*

Sub phylum Urochordata Eg: *Ascidia*

Subphylum Cephalochordata Eg: *Branchiostoma*

Subphylum Vertebrata :

Agnatha Eg: *Petromyzon*

Super class Pisces

Class: Chondrichthyes Eg: *Narcine*

Class: Osteichthyes Eg: *Echeneis*, *Hippocampus* and *Heteropneustes*

Super class Tetrapoda

Class Amphibia Eg: *Ichthyophis*, *Salamandra* and *Rhacophorus*

Class Reptilia Eg: *Chamaeleo*, *Daboia* & Tortoise

Class Aves Eg: *Columba*

Class Mammalia Eg: *Pteropus*

B. Wild life

6 hrs

I. Threats to Biodiversity

II. Wild life management and conservation Mention Protection Acts.

III. Sustainable development

IV. Red data Book & IUCN

Assignments

Teachers can suggest topics of Assignments / Seminars (**For internal evaluation only**).

References

1. Jordan E.L. & Verma, P.S. *Invertebrate Zoology* S. Chand & Co.
2. Jordan E.L. & Verma, P.S. *Vertebrate Zoology* s. chand & Co.
3. Kotpal, R.L. *Modern Text Book of Zoology* Rastogi Publi. *Vertebrate & Invertebrates*
4. Soper, R. *et al. Biological Sciences*, Cambridge University Press.
5. Rajesh Gopal. *Wild life Biology*.
6. Ekambraanatha Ayyar, M. & Ananthkrishnan, T.N. *Manual of Zoology, Vol. I (Part I & II)*,
S. Viswanathan, Madras.
7. Encarta: 2004 Edn or earlier versions (CDs), Microsoft.
8. Encyclopedia Britannica: 2004 Edn. or earlier versions (CDs), Britannica.com.India.
9. Ahluwalia, V.K. and Sunitha Malhotra-*Environmental Science*, Ane Books Pvt.Ltd.
<http://www.ucomp.berkeley.edu>.
<http://www.mbl.edu>.
<http://phylogeny.cornell.edu>
<http://www.ent.castate.edu>.

SYLLABUS
Second Semester B.Sc. Degree Programme
Complementary Course II: Zoology-II
ECONOMIC ZOOLOGY
Code: ZO2C02
(36 hours) (2 hours per week) (Credits - 2)

I. Parasitism in relation to man **12 hrs**

1. Introduction, classification of parasites and hosts (3 hrs)
(Obligatory, facultative, permanent, temporary, external, internal, and hyper parasites and parasitoid; definitive, intermediate, carrier and reserve hosts).
2. Infection and infestation (1 hrs).
Mention Hyperinfection and Auto infection.
3. Modes of infection (2 hrs)
Inoculative, contaminative direct and retroinfection.
4. Human Parasites (7 hrs)
Entamoeba histolytica, *Taenia solium*, *Schistosoma haematobium*,
Ancylostoma duodenale, *Wuchereria bancrofti* and *Enterobius vermicularis*

II. Insects in relation to man **12 hrs**

Insect Pests (4 hrs)

1. Introduction, Definition of Pests, Kinds of Pests, Causes of pest outbreak.
Nature of damage to host plants and control measures of the following pests
(Exclude structure and Life history of Pests).
 - a) *Spodoptera* sp. (rice swarming caterpillar)
 - b) *Leptocorisa* sp. (rice bug)
 - c) *Rhynchophorus* sp. (red palm weevil)
 - d) *Opisina* sp. (Black headed caterpillar, mention biological control)
 - e) *Aceria* sp. (Coconut mite)
 - f) *Helopeltis* sp. (tea bug)
 - g) *Cosmopolites* sp. (Banana rhizome weevil)
 - h) *Dacus* sp. (Fruit fly)
 - i) *Batocera* sp. (Mango stem borer)
 - j) *Sitophilus* sp. (rice weevil)
 - h) *Callosobruchus* sp. (pulse beetle)
 - i) *Chilo infuscatellus* (Sugarcane shoot borer).
 - j) *Platyedra gossypiella* (Pink Ball Worm).
 - k) *Etiella zinckenella* (Grampod Borer).

- l) *Menopon gallinae* (Shaft louse).
 - m) *Eomenacanthus stramineus* (Chicken louse).
 - n) *Hippobosca maculata* (house fly).
 - o) *Tabanus striatus* (horse fly).
2. Vectors of human diseases (3 hrs)
Insect vectors of human diseases and their control. *Anophales, Culex, Aedes, Xenopsylla, Cimex, Pediculus* and *Phthirus* (Diseases like malaria, filariasis, yellow fever, typhus fever, dengue, plague, chikun gunea; kala azar).
 3. Insect control (3 hrs)
Basic principles of chemical control and biological control. Integrated Pest Management (IPM) (Brief notes).
 4. Useful Insects (2 hrs)
Honey bee : social organization, importance of apiculture, bee products.
Silk worm and lac insect: Economic importance.

III. Aquaculture and Fishery Biology

12 hrs

1. Brief Introduction mentioning its scope in Kerala. (2 hrs)
2. Pisciculture: Egg collection and hatching, induced spawning (4 hrs)
Nursery ponds, manuring, feeding and harvesting,
Ornamental fish farming (Brief account). Mention common species.
3. Prawn culture: Breeding and spawning of prawns, seed collection and culture, types of prawn farms, mention common species (2 hrs).
4. Mussel farming: seed collection, artificial collection of seeds, induced spawning, rearing of larvae, farming methods, harvesting (2 hrs) (brief account).
5. Pearl Culture: Preparation of nuclei, preparation of host and graft tissue, implantation, nursing (brief account). (1 hrs)
6. Fish utilization: Nutrition value, byproducts. (1 hrs)

Assignment

Teachers can suggest topics for Assignments / Seminar (**For internal evaluation only**).

References

1. Baskaran, K.K. & Biju Kumar, A. Economic Zoology, Manjusha Publication.
2. Borajah, G., Lecturers on Sericulture, 2e, 1994, SBS Pub., Banglaore.

3. Nayar, K.K. *et al.* : General & Applied Entomology, TMH.
4. Shukla, G.S. & Upadhyay, V.B. : Economic Zoology, 4e, 2002, Rastogi.
5. Singh, S. : Bee keeping in India, ICAR.
6. Singh, V.R.P. & Ramachandran, V. : Frshwater Fish culture (1985) ICAR.
7. Srivastava, C.B.L. : Fishery Science and Indian Fisheries, 2002, Kitab Mahal.
8. Nayar, K.K. *et al.*: General & Applied Entomology, TMH.
9. Shukla, G.S. & Upadhyay, V.B. : Economic Zoology, 4e, 2002, Rastogi.
10. Singh, S. : Bee keeping in India, ICAR.

SEMESTER VI

Course Code: CHE6B13(E3)

Core Course XIII: Elective 3. MEDICINAL AND ENVIRONMENTAL CHEMISTRY

Total Hours: 54; Credits: 3; Hours/Week: 3

Module I: Health and Biochemical Analysis (6 hrs)

Definition of health - WHO standard - Sterilization of surgical instruments - Biochemical analysis of urine and serum.

Blood: Composition, grouping and Rh factor - Blood transfusion.

Module II: Drugs (6 hrs)

Definition – History of drugs – Prodrug – Prescription and non-prescription drugs – Routes of drug administration - Drug dosage - Effective use of drugs – Over dosage - Drug toxicity – Thalidomide tragedy (a brief study) – Drug abuse.

Assay of Drugs: Chemical, biological and immunological assays - LD₅₀ and ED₅₀ therapeutic index.

Indian Medicinal Plants: Kizharnelli, Thumbai, Hibiscus, Adathodai, Nochi, Thulasi, Brahmi, Aloe Vera and Neem plant (Major chemical constituents and medicinal uses).

Module III: Common Diseases and Treatment (12 hrs)

Diseases - Communicable and non-communicable diseases - Causes, symptoms and drugs used for the treatment of air-borne diseases (anthrax, chickenpox, influenza, measles and tuberculosis), water and food borne diseases (cholera, dysentery, typhoid fever and hepatitis A), bronchial asthma, kidney stone, diabetes, myocardial infarction and AIDS – Drugs used in the treatment for systemic hypertension and hypercholesterolemia.

Cancer: Definition - Lung cancer (causes, symptoms and treatment) – Avenues for the treatment of terminal cancer.

Treatment for Specific Poisons: Snake bite, arsenic and mercury compounds.

Module IV: Environmental Toxicology (6 hrs)

Introduction – Threshold Limiting Value – Source and toxicological effects of inorganic compounds (H₂S, Cl₂ and asbestos), organic compounds (CCl₄, phenol, benzene, phenylene diamines, nitroso amines and *p*-dichlorobenzene), persistent organic pollutants (dioxins, TCDD, pesticides: Endosulphan, carbaryl and DDT), phthalates and heavy metals (As and Hg).

Module V: Control and Monitoring of Air Pollutants (12 hrs)

Air Pollution Control Measures: Gravitational settling chamber, fabric filter, wet scrubber, catalytic converters, stacks and chimneys, cyclone collectors, Cottrell electrostatic precipitator, extraction ventilator, zoning and green belt.

Air Pollutant Monitoring: Sampling methods for particulate analysis - Filtration, sedimentation, electrostatic samplers, thermal precipitators and impingers. Sampling methods for gases and vapours – Cold trapping, absorption and adsorption. Analytical methods for the determination of CO, NO_x, SO_x, H₂S, hydrocarbons and particulate matter.

Module VI: Water Treatment Processes (12 hrs)

Types and characteristics of industrial waste water - Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange. Primary treatment - Secondary treatment - Trickling filters, activated sludge process and sludge digestion - Tertiary treatment - USAB process and deep well injection. Sewage and sewage analysis - Total solids, settleable solids, suspended solids, dissolved oxygen, BOD (Winkler's titration method and dissolved oxygen meter) and COD - Protection of surface waters from pollution with industrial sewage.

Use and conservation of water resources – Rain water harvesting - Sea water for agriculture.

References

1. G. Thomas, *Fundamentals of Medicinal Chemistry*, John Wiley & Sons Ltd., London, 2003.
2. Guyton and Hall, *Textbook of Medical Physiology*, 12th Edition, Saunders, US, 2010.
3. D.J. Abraham, *Burger's Medicinal Chemistry and Drug Discovery, Vol.1-6*, Wiley-Interscience, Hoboken, NJ, 2003.
4. B.L. Oser, *Hawk's Physiological Chemistry*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1979.
5. S.C. Rastogi, *Biochemistry*, 2nd Edition, Tata McGraw Hill Publishing Co., New Delhi, 2007 (Reprint).
6. Gurdeep R. Chatwal, *Synthetic Drugs*, Himalaya Publishing House, Bombay, 1995.
7. Jayashree Ghosh, *A Textbook of Pharmaceutical Chemistry*, 3rd Edition, S. Chand and Company Ltd., New Delhi, 1999.
8. Rasheeduz Zafar, *Medicinal Plants of India*, 1st Edition, CBS Publishers & Distributors Pvt. Ltd., New Delhi, 2009.
9. A.K. De., *Environmental Chemistry*, 6th Edition, New Age International (P) Ltd., New Delhi, 2006.
10. M.L. Davis, D.A. Cornwell, *Introduction to Environmental Engineering*, 3rd Edition, McGraw Hill, New Delhi, 1998.
11. S.E. Manahan, *Environmental Chemistry*, 8th Edition, CRC Press, Florida, 2004.
12. G.M. Masters, *Introduction to Environmental Engineering and Science*, 3rd Edition, Prentice-Hall Inc., New Delhi, 2007.
13. A.K. Ahluwalia, *Environmental Chemistry*, Ane Books India, New Delhi, 2008.
14. B.K. Sharma and H. Kaur, *Environmental Chemistry*, Goel Publishing House, Meerut, 1996.

SEMESTER V

Course Code: CHE5D01

Open Course 1: ENVIRONMENTAL CHEMISTRY

Total Hours: 36; Credits: 2; Hours/Week: 2

Note: Structure and chemical equations not required.

Module I: Environment (3 hrs)

Concept and scope of environmental chemistry – Segments of environment. Environmental pollution: Concepts and definition – Pollutant, contaminant, receptor and sink – Classification of pollutants - Global, regional, local, persistent and non-persistent pollutants.

Module II: Air Pollution (6 hrs)

Major regions of atmosphere – Tropospheric pollution and stratospheric pollution – Major air pollutants: Oxides of carbon, nitrogen and sulphur- Hydrocarbons – Chlorofluorocarbons - Particulates. Smog: London smog and photochemical smog. Automobile pollution. Effects of air pollution: Acid rain, green house effect and depletion of ozone layer. Control of air pollution - Alternate refrigerants - Bhopal Tragedy (a brief study). Causes, symptoms and drugs used for the treatment of air-borne diseases: Chickenpox, influenza, measles and tuberculosis.

Module III: Water Pollution (9 hrs)

Hydrological cycle – Importance of water - Aquatic pollution – Visible signs of aquatic pollution - Water pollution due to human activity – Pollution due to sewage, domestic wastes, industrial effluents, agricultural discharge, soaps and detergents. Eutrophication. Types of water pollutants: Biological agents, physical agents and chemical agents. Biological magnification and bioaccumulation. Water quality parameters: DO, BOD, COD, alkalinity, hardness, chloride, fluoride and nitrate. Toxic metals in water and their effects: Cadmium, lead and mercury - Minamata disaster (a brief study).

Water born diseases: Cholera, dysentery and typhoid – Symptoms and medicines.

Module IV: Soil, Noise, Thermal and Radioactive Pollutions (6 hrs)

Soil pollution: House hold, municipal and industrial solid wastes. Pollution due to plastics, pesticides, biomedical waste and E-waste (source, effects and control measures) – Non-degradable, degradable and biodegradable wastes. Hazardous waste. Noise pollution, thermal pollution and radioactive pollution (source, effects and control measures) – Hiroshima, Nagasaki and Chernobyl accidents (brief study). Endosulfan disaster in Kerala (brief study).

Module V: Pollution Control Measures (12 hrs)

Air pollution control measures – Gravitational settling chamber, fabric filter, wet scrubber, catalytic converters, stacks and chimneys, cyclone collectors, Cottrell electrostatic precipitator, extraction ventilator, zoning and green belt.

Water treatment methods - Primary, secondary and tertiary methods - Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange - USAB process and deep well injection.

Solid waste management: Recycling, incineration, digestion, dumping, land treatment and composting.

Introduction to Green chemistry (elementary ideas only).

Pollution Control Board: Duties and responsibilities (a brief study).

Some Environmental movements: Chipco, Narmada, Silent Valley and Plachimada.

References

1. A.K. De, *Environmental Chemistry*, 6th Edition, New Age International, New Delhi, 2006.
2. S.S. Dara, *A Textbook of Environmental Chemistry and Pollution Control*, 8th Edition, S. Chand and Sons, New Delhi, 2008 (Reprint).
3. S.E. Manahan, *Environmental Chemistry*, 8th Edition, CRC Press, Florida, 2004.
4. P.K. Goel, *Water Pollution: Causes, Effects and Control*, New Age International, New Delhi, 2006.
5. Kochu Baby Manjooran, *Modern Engineering Chemistry*, Kannatheri Publications, 2009.
6. A.K. Ahluwalia, *Environmental Chemistry*, Ane Books India, New Delhi, 2008.
7. B.K. Sharma and H. Kaur, *Environmental Chemistry*, Goel Publishing House, Meerut, 1996.

Since the course does not require a solid base in physics only qualitative & elementary ideas of the subject are expected from the students.

PH5 D01(1): NON CONVENTIONAL ENERGY SOURCES (36 Hours Credit – 2)
(Problems not required)

UNIT I .

Solar energy : 10 Hrs Max marks 20

Solar constants, Solar radiation measurements, solar energy collector, Physical principle of the conversion of solar radiation in to heat, ,solar cookers, solar distillation, solar furnaces, solar greenhouses, solar electric power generation(no need of mathematical equations)

(2:1,2;2,2:5,3:1,-3:3,3:7,3:8,5:6,5:8,5:10-12 Non conventional sources of Energy by G D Rai, Khanna publishers)

UNIT II.

Wind energy: 8Hrs Max marks 14

Basic principle of wind energy conversion, basic components of wind energy conversion system, wind energy collectors. application of wind energy.

(6:1,6:2.1,6:5,6:7,6:8.1,6:8.2,6:8.4,6:13 Non conventional sources of Energy by G D Rai, Khanna publishers)

UNIT III.

Geothermal energy and energy from biomass: 10 Hrs Max marks 20

Geothermal sources, geo-pressured resources, advantages and disadvantages of geothermal energy over other energy forms, application of geothermal energy. introduction to bio mass

Method of obtaining energy from biomass.

(8:4,8:6,8:12,8:13,7:1,7:23 Non conventional sources of Energy by G D Rai, Khanna publishers)

UNIT IV .

Energy from Oceans and Chemical energy resources: 8 Hrs Max marks 14

Ocean thermal electric conversion. Energy from tides, Basic principle of tidal power, advantages and limitation of tidal power generation. advantages and disadvantages of wave

energy wave energy conversion devices. batteries, advantages of battery for bulk energy storage

(9:1,9:2.1-9:2.4,9:3.1,9:3.2,9:3.9,9:4.2,9:4.4,10:3.1-10:3.3,10:3.7 Non conventional sources

of Energy by G D Rai, Khanna publishers)

Text books:

1. Non – Conventional Energy Resources by G. D. Rai, Khanna Publishers, 2008.
2. Solar Energy Fundamentals and application by H.P. Garg and J. Prakash, Tata McGraw- Hill Publishing company ltd, 1997.
3. Solar energy by S. P. Sukhatme, Tata McGraw- Hill Publishing company ltd,

FIRST SEMESTER B.Sc. ZOOLOGY PROGRAMME

ZOOLOGY CORE COURSE- I [Theory]

ANIMAL DIVERSITY: NON-CHORDATA PART- I

Code: ZOL1B01T

[DIVERSITY, ADAPTATIONS AND FUNCTIONAL ANATOMY OF PROTOZOANS AND ACOELOMATE AND PSEUDOCOELOMATE NON-CHORDATES]

[36 hours] [2 hours per week] [2 Credits]

COURSE OUTCOMES (COs)

COs	Course Outcome Statements
CO1	Describe the principles of classification and nomenclature (5 hrs)
CO2	Explain the five kingdom classification of living organisms (1 hr)
CO3	Understand the concepts of classification of animals (4 hrs)
CO4	Explain the classification with examples and characteristic features of kingdom Protista and describe the morphology and structural organization of <i>Paramecium</i> (6 hrs)
CO5	Describe the characteristic features of subkingdom Mesozoa (1 hr)
CO6	Explain the classification of phylum Porifera and elucidate the salient features of each class (3 hrs)
CO7	Describe the characteristic features of phylum Cnidaria and Ctenophora, illustrate the classification of phylum Cnidaria down to classes and explain the structural organization of <i>Obelia</i> (8 hrs)
CO8	Explain the salient features of phylum Platyhelminthes and illustrate its classification down to classes (3 hrs)
CO9	Explain the characteristic features and classification of super-phylum Aschelminthes and phylum Nematoda (3 hrs)
CO10	Elucidate the characters of Pseudocoelomate minor phyla Rotifera and Gastrotricha (2 hrs)

Question paper pattern for external examination

[Module 1-4: Short answer 5x2=10 marks, Paragraph 3x5=15 marks, Essay 1x10= 10 marks
Module 5-10: Short answer 7x2=14 marks, Paragraph 4x5=20 marks, Essay 1x10=10 marks]

Section A. CONCEPTS OF CLASSIFICATION OF ORGANISMS

MODULE 1. Principles of classification and nomenclature (5 hrs)

Systematics: natural and classical. Nomenclature: Binomial and Trinomial nomenclature; International rules of Zoological nomenclature (brief account); Mention modern trends in systematics: Chemotaxonomy, Serotaxonomy, Cytotaxonomy, Evolutionary taxonomy, Numerical taxonomy (Phenetics), Cladistics (Phylogenetics), Molecular systematics, DNA barcoding.

[Short answers/paragraphs/Essays]

MODULE 2. Five kingdom classification of living organisms (1 hr)

Mention Cavalier-smith's eight kingdom classification also.

[Short answers/Paragraphs]

MODULE 3. Concepts of classification of animals (4 hrs)

Classification based on number of cells, tissue or organ system level of organization, development of germ layers, development of symmetry, development of coelom, segmentation, homology and analogy of organs and their origin, development of mouth and digestive tract (brief account).

[Short answers/Paragraphs]

Section B. CLASSIFICATION OF KINGDOM PROTISTA

MODULE 4. Kingdom: PROTISTA (6 hrs)

Characteristic features and classification of Kingdom Protista down to phyla. [Salient features of the major groups of protists given below with notes on the examples cited]

Phylum: Rhizopoda	e.g. <i>Entamoeba</i>
Phylum: Dinoflagellata	e.g. <i>Noctiluca</i>
Phylum: Parabasilia	e.g. <i>Trichonympha</i>
Phylum: Apicomplexa [=Sporozoa]	e.g. <i>Plasmodium</i>
Phylum: Ciliophora	e.g. <i>Vorticella</i> .

Type **Paramecium**: Morphology and structural organization [as revealed by compound microscopy]; locomotion, nutrition, excretion, osmoregulation and reproduction; conjugation in detail.

[Short answers/Paragraphs/Essays]

Section C. KINGDOM: ANIMALIA

Salient features of the Major Phyla of animals and their diversity.

[Habits, habitat, morphology, functional anatomy and life history of representative types (wherever specified) and classification of each phylum down to classes, except otherwise mentioned, and examples thereof: Study of animal diversity with typical examples from each class, with emphasis on ecological and adaptive features, economic importance and such other points of biological interest expected. Only very brief account of each example is to be studied.]

MODULE 5. Subkingdom: MESOZOA (1 hr)

A brief account of Dicyemid (=Rhombozoans) mesozoans [e.g. *Dicyema*] and Orthonectid mesozoans [e.g. *Rhopalura*]

[Short answers/Paragraphs]

MODULE 6. Subkingdom: PARAZOA (3 hrs)

Phylum: PORIFERA

Classification down to classes and salient features of each class.

Class Calcarea (=Calcispongiae)	e.g. <i>Leucosolenia</i>
Class Demospongiae	e.g. <i>Spongilla</i>
Class Hexactinellida (=Hyalospongiae)	e.g. <i>Euplectella</i>

Give an account of canal system (Asconoid, Syconoid, Leuconoid and Rhagonoid); Mention amphiblastula, parenchymula and sponge gemmule.

[Short answers/Paragraphs/Essays]

MODULE 7. Subkingdom: METAZOA (8 hrs)

Phylum CNIDARIA [=COELENTERATA] (7 hrs)

Classification of the phylum down to classes and salient features of each class.

Class Hydrozoa	e.g. <i>Halistemma</i> , <i>Physalia</i>
Class Scyphozoa	e.g. <i>Rhizostoma</i>

Class Anthozoa e.g. *Adamsia*, *Zoanthus*, and *Madrepora*

Type **Obelia**: Morphology and life cycle.

Polymorphism in cnidarians with special reference to siphonophores.

Phylum CTENOPHORA [=ACNIDARIA] (1 hr)

Unique features as exemplified by *Pleurobrachia*; mention cidioid larva.

[Short answers/Paragraphs/Essays]

MODULE 8. ACOELOMATA (3 hrs)

Phylum PLATYHELMINTHES

Classification down to classes and salient features of the following classes.

Class Turbellaria e.g. *Bipalium*

Class Trematoda e.g. *Fasciola*

Class Cestoda e.g. *Taenia*

Type **Dugesia** (Planaria): Structural organization, Digestive system, locomotion and reproduction.

[Short answers/Paragraphs/Essays]

MODULE 9. PSEUDOCOELOMATA (3 hrs)

Super Phylum: ASCHELMINTHES

Classification down to phyla; highlight the heterogeneous nature of animals of this group.

Phylum: NEMATODA

Characteristic features of *Ascaris*.

Examples: *Ancylostoma*, *Enterobius*, *Wuchereria*

[Short answers/Paragraphs/Essays]

MODULE 10. PSEUDOCOELOMATE MINOR PHYLA (2 hrs)

Salient features of the following pseudocoelomate minor phyla:

Phylum **Gastrotricha** e.g. *Chaetonotus*

Phylum **Rotifera** e.g. *Brachionus*

[Short answers/Paragraphs]

Topics for assignments/seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Nutrition in protozoans.
2. Reproduction in protozoans.
3. Parasitic protozoans of man.
4. Helminth parasites of man.
5. Reef building corals and coral reefs.

REFERENCES

- Anderson, D. T. (2001). *Invertebrate Zoology*. 2nd edition. University of Michigan, Oxford University Press (Indian Edition. 2006).
- Barnes, R.D. (1982). *Invertebrate Zoology*, 5th Edition. Holt Saunders International Edition.

- Barnes, R.S.K., Calow, P.P., Olive, P.J.W., Golding, D.W. & Spicer, J.I. (2009). *The Invertebrates: A Synthesis*, 3rd Edition. Wiley Blackwell Science, UK.
- Bhatnagar, M.C. & Bansal, G. (2014). *Non-chordata (Invertebrate Zoology)*. Krishna Prakashan Media (P) Ltd., Meerut.
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- Buchsbaum, R., Buchsbaum, M., Pearse, J. & Pearse V. (2013). *Animals without Backbones: An Introduction to the Invertebrates*. University of Chicago Press, USA.
- Dhama, P. S. & Dhama, J. K.: *Invertebrate Zoology*. R. Chand & Co, New Delhi.
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- Jordan, E. L. & Verma, P. S. (2001). *Invertebrate Zoology*. S. Chand & Company, New Delhi.
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- McClanahan, T. R., Sheppard, C. R. C. & Obura, D. O. (2000). *Coral Reefs of the Indian Ocean: Their Ecology and Conservation*. Oxford University Press, USA.
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- Puranik, P. & Bhate, A. (2008). *Animal Forms and Functions: Invertebrata*. Sarup & Sons, New Delhi.
- Ruppert, E. E., Fox, R. S. & Barnes, R. D. (2004). *Invertebrate Zoology: A Functional Evolutionary Approach*. 7th edition. Thomson-Brooks Cole, USA.
- Sandhu, G.S. (2005). *Textbook of Invertebrate Zoology, Volume I*. University of California & Campus Books International, New Delhi.
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- Verma, A. (2005). *Invertebrates: Protozoa to Echinodermata*. Alpha Science Intl., Oxford.

SECOND SEMESTER B. Sc. ZOOLOGY PROGRAMME

ZOOLOGY CORE COURSE- II (Theory)

ANIMAL DIVERSITY: NON-CHORDATA PART – II

Code: ZOL2B02T

[DIVERSITY, ADAPTATIONS & FUNCTIONAL ANATOMY OF COELOMATE NON-CHORDATES]

[36 hours] [2 hours per week] [2 Credits]

COURSE OUTCOMES [COs]

COs	Course Outcome Statements
CO1	Explain the classification with examples and characteristic features of phylum Annelida and describe the morphology and structural organization of <i>Neanthes</i> (7 hrs)
CO2	Describe the distribution, peculiarities and affinities of phylum Onychophora (2 hrs)
CO3	Explain the classification of phylum Arthropoda; elucidate the salient features of each class and describe the morphology and structural organization of <i>Penaeus</i> (11 hrs)
CO4	Describe the characteristic features of phylum Mollusca, illustrate its classification down to classes and explain the structural organization of <i>Pila globosa</i> (8 hrs)
CO5	Explain the salient features of phylum Echinodermata and illustrate its classification down to classes (4 hrs)
CO6	Understand the salient features and affinities of phylum Hemichordata (1 hr)
CO7	Elucidate the characters of coelomate minor phyla Phoronida, Ectoprocta and Echiura (3 hrs)

Question paper pattern for external examination

[Module 1-3: Short answer 7x2=14 marks, Paragraph 4x5=20 marks, Essay 1x10= 10 marks
Module 4-7: Short answer 5x2=10 marks, Paragraph 3x5=15 marks, Essay 1x10=10 marks]

COELOMATA

MODULE 1. Phylum ANNELIDA (7 hrs)

Classification down to subclasses; salient features of the following classes and subclasses:

1. Class Polychaeta e.g. *Arenicola*
2. Class Clitellata
 - Subclass Oligochaeta e.g. *Megascolex*
 - Subclass Hirudinea e.g. *Hirudinaria*, *Haemadipsa*

Type: ***Neanthes*** [Nereis]

[Morphology, body wall, digestive system, respiratory system, circulatory system, excretory system, sense organs and reproductive system. Mention Heteronereis stage and Trochophore larva.]

[Short answers/Paragraphs/Essays]

MODULE 2. Phylum ONYCHOPHORA (2 hrs)

Peripatus [distribution, peculiarities and affinities].

[Short answers/Paragraphs]

MODULE 3. Phylum ARTHROPODA (11 hrs)

Classification down to classes (mention the five subphyla and 16 arthropod classes); salient features of the following classes:

- | | |
|----------------------|--|
| 1. Class Trilobita | [brief account only] |
| 2. Class Merostomata | e.g. <i>Limulus</i> |
| 3. Class Arachnida | e.g. <i>Heterometrus (Palamnaeus), Heteropoda</i>
(Huntsman spider, Order <i>Araneae</i>).
Mention ticks and mites (Subclass <i>Acar</i>). |
| 4. Class Chilopoda | e.g. <i>Scolopendra, Scutigera</i> |
| 5. Class Diplopoda | e.g. <i>Spirostreptus, Julus</i> |
| 6. Class Crustacea | e.g. <i>Sacculina, Eupagurus</i> |
| 7. Class Insecta | e.g. <i>Lepisma, Mantis, Tabanus, Troides</i>
<i>minos</i> (Southern Birdwing butterfly), <i>Papilio</i>
<i>buddha</i> (Malabar Banded Peacock), <i>Apis</i> . |

Type: ***Penaeus indicus*** [Prawn]

[Morphology, digestive system, respiratory system, blood vascular system, excretory system, nervous system, sense organs (statocyst, compound eye in detail), reproductive system and development] [Details of larval stages not expected].

[Short answers/Paragraphs/Essays]

MODULE 4. Phylum MOLLUSCA (8 hrs)

Classification down to classes; Mention Nudibranchs and *Nautilus*. Salient features of the following classes:

- | | |
|---------------------------------------|-------------------------|
| 1. Class Aplacophora | e.g. <i>Chaetoderma</i> |
| 2. Class Polyplacophora (=Amphineura) | e.g. <i>Chiton</i> |
| 3. Class Monoplacophora | e.g. <i>Neopilina</i> |
| 4. Class Gastropoda | e.g. <i>Turbinella</i> |
| 5. Class Bivalvia (=Pelecypoda) | e.g. <i>Perna</i> |
| 6. Class Scaphopoda | e.g. <i>Dentalium</i> |
| 7. Class Cephalopoda (=Siphonopoda) | e.g. <i>Sepia</i> |

Type: ***Pila globosa*** [Apple Snail]

[Morphology, digestive system, respiratory system, blood vascular system, excretory system, nervous system, sense organs (osphradium in detail) and reproductive system].

[Short answers/Paragraphs/Essays]

MODULE 5. Phylum ECHINODERMATA (4 hrs)

Classification down to classes [of extant forms only]; salient features of the following classes and brief account of examples:

- | | |
|------------------------|-------------------------|
| 1. Class Crinoidea | e.g. <i>Antedon</i> |
| 2. Class Asteroidea | e.g. <i>Astropecten</i> |
| 3. Class Ophiuroidea | e.g. <i>Ophiothrix</i> |
| 4. Class Holothuroidea | e.g. <i>Holothuria</i> |
| 5. Class Echinoidea | e.g. <i>Echinus</i> |

Structural peculiarities of *Asterias* (star fish); water vascular system in detail.

[Short answers/Paragraphs/Essays]

MODULE 6. Phylum HEMICHORDATA (1 hr)

Balanoglossus: Salient features and affinities.

[Short answers/Paragraphs]

MODULE 7. COELOMATE MINOR PHYLA (3 hrs)

Salient features of the following coelomate minor phyla; mention examples specified [structure and life history not required).

- | | |
|---------------------------------------|----------------------|
| 1. Phylum Phoronida | e.g. <i>Phoronis</i> |
| 2. Phylum Ectoprocta [Bryozoa] | e.g. <i>Bugula</i> |
| 3. Phylum Echiura | e.g. <i>Bonellia</i> |

[Short answers/Paragraphs]

Topics for Assignments/Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students).

- 1] Larval forms in Crustacea and their significance.
- 2] Metamorphosis in insects.
- 3] Social organization in insects.
- 4] Economic importance of molluscs.
- 5] Insect vectors of human diseases.

REFERENCES

- Anderson, D. T. (2001). *Invertebrate Zoology*. 2nd edition. University of Michigan, Oxford University Press (Indian Edition. 2006).
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- Emiliyamma, K. G. & Radhakrishnan, C. (2006). *Dragonflies and Damselflies of Kerala*. Zoological Survey of India, Kolkata.
- Jordan, E. L. & Verma, P. S. (2001). *Invertebrate Zoology*. S. Chand & Co, New Delhi.
- Kehimkar, I. (2016). *Butterflies of India*. Bombay Natural History Society, Mumbai.
- Kiran, C. G. & Raju, D. V. (2013). *Dragonflies and Damselflies of Kerala: A Bilingual Pictorial Guide*. Tropical Institute of Ecological Studies, Kottayam.

SDC4FT16 – Environmental Textiles

Course No: 4.4

Course Code: SDC4FT16

Course Name: Environmental Textiles

Credits: 4

Hours per week: 4

Total hours: 60

Course Objectives

- To understand the environmental effects of the textile industry
- To understand about various ecofriendly fibers and other ecological aspects related to fashion
- To develop an Ecofriendly attitude towards fashion and product development

Course Outline

Module I

Indian textile industry-introduction, economic growth, over view

10 hours

Module II

Environmental impacts- production, processing, transportation, use and care, child labour. Eco factors, ethical issues

10 hours

Module III

Ecofriendly fibers (hemp,jute,ramie, bamboo, pineapple, mulberry, banana, novel fibers – spider silk, bacterial cellulose, corn fibers, fortrel,ecospun).

Organic cotton- production, significance, difference between organic and conventional cotton, market potential, limitations. Fabric care- Ecofriendly practices

15 hours

Module IV

Use of biotechnology: Textile processing. Ecofriendly fibers- transgenic cotton, coloured cotton, hybrid cotton, bio- fabrics. Use of enzymes

15 hours

Module V

Eco labeling-introduction, types, aims, criteria, eco- labelling and international scenario, types of eco- labels.

10 hours

Reference Books:

- Marie O' Mahoney, Advanced Textiles for Health and Wellbeing
- Allen, Carlson (2001) - Environmental Aesthetics, The Rutledge Companion to Aesthetics – Routledge, London
- Cunningham, W.P.Cooper, T.H.Gorhani, E & Hepworth, M.T.2001 Environmental Encyclopedia, Jaico Publ. House. Mumbai.

SDC4FT17 (P) – Surface Ornamentation

Course No: 4.5

Course Code: SDC4FT17(P)

Course Name: Surface Ornamentation

Credits: 4

Hours per week: 4

Total hours: 60

Course Objective

- To teach the students techniques of hand embroidery stitches.
- To make students aware of the basic fabric ornamentation techniques like fabric painting, sequins work, etc.
- To introduce the students to various traditional embroideries of India

Course Outline

Preparation of samples for the following:

Basic Hand Stitches

1. Running stitch
2. Back stitch
3. Stem stitch
4. Split stitch
5. Chain stitch
6. Magic chain stitch
7. Herringbone stitch
8. Feather stitch
9. Buttonhole stitch
10. Chevron stitch
11. Satin stitch
12. Lazy daisy
13. French knots
14. Bullion knots

Traditional embroidery:

1. Kutch embroidery of Gujarat
2. Kasuti of Karnataka
3. Chikankari of Lucknow
4. Kantha of West Bengal

Other techniques of ornamentation

1. Smocking
2. Beadwork

FIFTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME

**CORE COURSE -5: GYMNOSPERMS, PALAEOBOTANY,
PHYTOGEOGRAPHY, EVOLUTION**

Code: BOT5B05T

[Total 99 hours: Theory 63, Practical 36]

GYMNOSPERMS

Theory- 19 hrs. [1hr. per week]

1. Introduction, General characters and classification of Gymnosperms (Sporne, 1965) 3 hrs.
2. Distribution, morphology, anatomy, reproduction, life cycle and affinities of the following types (Developmental details are not required): a. *Cycas*
b. *Pinus* c. *Gnetum* 12 hrs.
3. Evolutionary trends in Gymnosperms; Affinities of Gymnosperms with Pteridophytes and Angiosperms 3 hrs.
4. Economic importance of Gymnosperms. 1 hr.

PRACTICALS Total: 18 hrs.

1. *Cycas*- Habit, coralloid root, T.S. of coralloid root, T.S. of leaflet, T.S. of rachis, male cone and L.S. of male cone, microsporophyll, megasporophyll, T.S. of microsporophyll, L.S. of ovule and seed. 6 hrs.
2. *Pinus*- branch of unlimited growth, spur shoot, T.S. of stem and needle, male cone and female cone, L.S. of male cone and female cone, seed. 6 hrs.
3. *Gnetum*- Habit, stem T.S., leaf T.S., male and female cones, L.S. of ovule, seed. 6 hrs.

References

1. Chamberlain C.J., 1935, Gymnosperms – Structure and Evolution, Chicago University Press.
2. Coutler J.M. and C.J. Chamberlain, 1958, Morphology of Gymnosperms. Central Book Depot. Allahabd.
3. Sporne K.R. 1967, The Morphology of Gymnosperms, Hutchinson and Co. Ltd. London.
4. Sreevastava H.N. 1980, A Text Book of Gymnosperms. S. Chand and Co. Ltd., New Delhi.
5. Vasishta P.C. 1980, Gymnosperms. S. Chand and Co., Ltd., New Delhi.

PALAEOBOTANY [Total: 9 hrs.]

- | | |
|---|--------|
| 1. Introduction and objectives | 1 hr. |
| 2. Fossil formation and types of fossils | 1 hr. |
| 3. Geological time scale- sequence of plants in geological time | 1 hr. |
| 4. Fossil Pteridophytes-Rhynia, lepidocarpon and Calamites | 3 hrs. |
| 5. Fossil gymnosperms- Williamsonia | ½hr. |
| 6. Importance of Indian Paleobotanical Institutes (brief) | 1hr. |
| 7. Brief mention of fossil deposits in India | ½ hr. |
| 8. Indian Palaeobotanists: Birbal Sahni and Savithri Sahni | ½ hr. |
| 9. Applied aspects of Palaeobotany- exploration of fossil fuels | ½ hr. |

PRACTICALS Total: 9 hrs.

1. Fossil Pteridophytes - Rhynia stem, Lepidodendron, and Calamites
2. Fossil gymnosperms- Williamsonia

References:

Andrews H.N. 1961, Studies in Paleobotany. John Wiley and Sons Inc., New York.

Arnold C.A., 1947, Introduction to paleobotany, Tata McGraw Hill, New Delhi.

Shukla, A.C. & S.P. Misra, 1975, Essential of Palaeobotany, Vikas Publishing House, Pvt. Ltd., Delhi.

Sreevastava H.N., 1998, Palaeobotany, Pradeep Publishing Company, Jalandhan.

Sewart, W.N., 1983, Palaeobotany and the Evolution of Plants. Cambridge Uni. Press, London.

Taylor, T.N. Paleobotany. An Introduction to Fossil Plant Biology. Mc Graw Hill, New York.

Steward A.C., 1935, Fossil Plants Vol. I to IV.

Watson J. An introduction to study of fossil plants. Adams and Charles Black Ltd. London.

PHYTOGEOGRAPHY [Theory: 15 hrs]

- | | |
|--|--------|
| 1. Definition, concept, scope and significance of phytogeography. | 1 hr. |
| 2. Patterns of plant distribution - continuous distribution and discontinuous distribution, vicarism, migration and extinction | 3 hrs. |
| 3. Continental drift -Evidences and impact. | 2 hrs. |
| 4. Glaciation: Causes and consequences. | 2 hrs. |
| 5. Theory of land bridges. | 2 hrs. |
| 6. Endemic distribution, theories on endemism, age and area hypothesis. | 3 hrs. |
| 7. Phytogeographical zones (phytochoria) of the world and India. | 2 hrs. |

PRACTICALS (9 hrs.)

1. Draw the phytogeographic zones of the world.
2. Draw the phytogeographic zones of India.

References

1. Ronald Good, 1947. *The Geography of Flowering Plants*. Longmans, Green and Co, New York
2. Armen Takhtajan, 1986. *Floristic Regions of the World*. (translated by T.J. Crovello & A. Cronquist). University of California Press, Berkeley.
3. P. D. Sharma, 2009, *Ecology and Environment*, Rastogi Publications, Meerut

EVOLUTION [Total: 20 hrs.]

1. Origin of Earth – Introduction; Evidences of organic evolution; Evidences from Morphology, Anatomy, Embryology, Palynology, Genetics and Molecular Biology. 3 hrs.
2. Condensation and Polymerisation; Protenuoids and Prions – Oparin’s concept; Miller’s experiment. 3 hrs.
3. Evolution of prokaryotic and eukaryotic cells. Archaeobacteria – Early fossilized cells. 2 hrs.
4. Theories on origin and evolution of species: Spontaneous generation; Lamarckism; Darwinism; Weismann and de Vries, Neo-Darwinism and its objection; Arguments and support for Darwinism. 4 hrs.
5. Genetic Constancy and Creation of Variability : Cell divisions and genetic constancy; – Genetic variability by recombination, Chromosomal variations, Gene mutations, Selection and genetic drift. 5 hrs.
6. Speciation: Isolating mechanism – Modes of speciation – sympatric and allopatric. 3 hrs.

References

1. Crick F., 1981. *Life itself: Its origin and Nature*. Simon and Schuster, New York.
2. Drake J.W., 1970. *The molecular basis of mutation*. Holden – Day – San Francisco.
3. Dott R.H., R.L. Batten, 1981. *Evolution of the earth 3rd edn*. McGraw Hill New York.

4. Fox S.W. and K. Dose, 1972. Molecular evolution and the origin of life. W.H. Freeman & Co., San Francisco.
5. Gould S.J. 1977. Ontogeny and Phylogeny. Harvard Univ. Press, Cambridge, Mass.
6. Jardine N., D.Mc Kenzie, 1972. Continental drift and the dispersal and evolution of organisms. Nature, 234. 20-24.
7. Miller, S.L. 1953. A production of aminoacids under possible primitive earth conditions. Science, 117., 528-529.
8. Strickberger, 1990. Evolution, Jones and Bastlett Publishers International, England.

FIFTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME
CORE COURSE-6: ANGIOSPERM MORPHOLOGY & SYSTEMATICS

Code: BOT5B06T

[Total 99 hours: Theory 63, Practical 36]

ANGIOSPERM MORPHOLOGY Theory 18 - Hrs. [1hr. per week]

- | | | |
|----|--|--------|
| I | Morphological description of a flowering plant; Plant habit | 1 hr. |
| | a. Root: Types - Tap root, fibrous root; Modifications - Definition with examples - Storage, aerial, pneumatophores, buttress | 1 hr. |
| | b. Stem: Habit - Acaulescent, Caulescent, Cespitose Prostrate, Repent, Decumbent, Arborescent, Suffrutescent (Definition with examples only); Modification - Underground, Aerial, Subaerial with examples | 2 hrs. |
| | c. Leaves: Lamina, petiole, leaf tip, leaf base, stipule, pulvinus; Phyllotaxy; types - simple and compound; shapes of lamina; leaf tip; leaf base; leaf margin; leaf surface features: hairiness - tomentose, glabrous, scabrous, strigose, hispid. | 3 hrs. |
| II | Inflorescence: racemose, cymose and specialised (cyathium, hypanthodium, coenanthium verticillaster, thyrsus) | 3 hrs. |

II Flower: Flower as a modified shoot - detailed structure of flowers - floral parts - their arrangement, relative position, cohesion and adhesion - symmetry of flowers - floral diagram and floral formulae. 4 hrs.

III. Fruits – simple, aggregate and multiple with examples; Seed structure - dicot and monocot - albuminous and exalbuminous, aril, caruncle; Dispersal of fruits and seeds - types and adaptations. 4 hrs.

PRACTICALS (Total: 9 hours)

1. Students are expected to identify the types mentioned in the syllabus.
2. The typical examples mentioned under inflorescence and fruits must be recorded.

References

1. Gangulee, H.C., J.S. Das & C. Dutta. 1982. College Botany (5th Ed.) New Central Book Agency, Calcutta.
2. George, H.M. Lawrence. 1951. Introduction to Plant Taxonomy. Mac Millan comp. Ltd., New York.
3. Simpson, M. G. 2006. Plant Systematics. Elsevier Academic Press, London
4. Ananta Rao T. Morphology of Angiosperms.

SYSTEMATICS Theory: 45 hrs. [2 ½ hrs. per week]

Module-I

1. Components of systematics: identification, description nomenclature and classification; objectives and importance of systematics 2 hrs.
2. Development of Plant systematics: Folk taxonomy, Herbalists, Early taxonomists: Caesalpino, Bauhin, Linnaeus; Natural systems; Phylogenetic systems; Phenetics; Cladistics (Brief account of various phases). 3 hrs.

3. Systems of classification: Artificial – Linnaeus; Natural – Bentham and Hooker (detailed study); Phylogenetic – Hutchinson; Angiosperm Phylogeny Group system – (introduction only). 4 hrs.

Module - II

1. Detailed study (systematic position, distribution, common members, diagnostic features, description from habit to fruit, economic importance of the following families.

Annonaceae, Malvaceae, Rutaceae, Fabaceae with sub families, Myrtaceae, Cucurbitaceae, Rubiaceae, Asteraceae, Apocynaceae, Asclepiadaceae, Solanaceae, Acanthaceae, Lamiaceae, Euphorbiaceae, Liliaceae and Poaceae.

16 hrs.

Module- III

1. Taxonomic structure – Hierarchy; Concepts of taxa: Species – Biological, Phenetic and Phylogenetic; Genus; Family. 2 hrs.
2. Taxonomic character – concept, primitive and advanced characters, sources, comparative morphology, vegetative, reproductive, Macro and micromorphology, modern trends in taxonomy, cytotaxonomy, chemotaxonomy, numerical taxonomy, molecular taxonomy and phylogenetics. 3 hrs.
3. Contributions of eminent Taxonomists viz Hendrich van Rheed, William Roxburg, Robert White and G. S. Gamble. 2 hrs.

Module - IV

1. Plant nomenclature – Limitations of common name, ICBN, Principles (introduction only); Typification (holotype, isotype, syntype paratype and lectotype); Priority – merits and demerits; Effective and valid publication; Author citation. 5 hrs.

2. Plant identification – Keys; indented and bracketed, construction and applications. 3 hrs.
3. Taxonomic information resources – Herbarium preparation and maintenance, Herbarium types: International- Kew (K); National-Central national herbarium (CAL), MH Coimbatore. Botanic Gardens: RBG, Kew, IGB, Kolkotta; TBGRI and Malabar botanici Garden, Olavanna , Kozhikode. 3 hrs.
4. Taxonomic literature- Floras, Monographs, Revisions, Journals and online resources & Databases. 2 hrs.

PRACTICALS Total: 27 hrs.

Students are expected to work out at least two members of each family mentioned in the syllabus and make suitable diagrams, describe them in technical terms and identify up to species using the flora.

1. Students shall be able to prepare artificial key to segregate any five given plants and must be recorded.
2. Students shall submit not less than 15 properly identified herbarium specimens of varying taxa during time of their practical examination.
3. It is compulsory that every student has to undertake a field study tour of not less than 3 days for observing plant diversity under the guidance of teachers of the Department in the 5th semester. Moreover, they have to submit a tour report countersigned by the Head of the department during the practical examination.

If a student fails to undergo the study tour he /she may not be permitted to attend the examination.

References

1. Sivarajan, V.V. 1991. Introduction to Principles of Plant Taxonomy. Oxford & IBH, New Delhi.
2. Sporne, K.R. 1974. Morphology of Angiosperms. Hutchinson University Press London.

3. Radford, A.E. 1986. Fundamentals of plant systematics. Harper & Row Publishers, New York.
4. NaiK, V.N. Taxonomy of Angiosperms. TATA McGraw Hill, New Delhi
5. Burkill, I.H. 1965. Chapters on the History of Botany in India, Delhi.
6. Gurucharan Singh, 2001. Plant systematics - Theory and Practice. Oxford & IBH, New Delhi.
7. Davis, P.H. & V.H. Heywood, 1963. Principles of Angiosperm Taxonomy. Oliver & Boyd Ltd., London.
8. Henry, A.N. & Chandrabose An aid to International Code of Botanic Nomenclature.
9. Jeffrey, C. 1968. An introduction to Plant Taxonomy, London.
10. Simpson, M.G. 2006. Plant Systematics. Elsevier Academic Press, London
11. Stuessy, T.F. 1990. Plant Taxonomy – The systematic evaluation of Comparative data. Columbia University Press, New York.
12. Sharma, B.D. et al. (Eds.) Flora of India vol. I. Botanical Survey of India, Calcutta.
13. Sambamurthy A..S.S. 2005;Taxonomy of Angiosperms, i.K. International Pvt. Ltd, New Delh.
14. Pandey, S.N. & S.P. Misra. 2008. Taxonomy of Angiosperms. Ane Books India, New Delhi.
15. Sharma, O.P. 1996. Plant Taxonomy. TATA McGraw Hill, New Delhi.
16. Clive A. Stace 1991: Plant Taxonomy and Biosystematics, Cambridge University Press.
17. Bharati Bhattacharyya 2009; Systematic Botany, Narosa Publishing House Pvt. Ltd., New Delhi.

18. Mondal A.K. 2009: Advanced Plant Taxonomy, New Central Book agency Pvt. Ltd. KolKota.

FIFTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME

CORE COURSE- 7: EMBRYOLOGY, PALYNOLOGY, ECONOMIC BOTANY, ETHNOBOTANY, HORTICULTURE

Code: BOT5B07T

[Total 99 hours: Theory 63, Practical 36]

EMBRYOLOGY (Theory - 18 Hrs.) (1 hr. per week)

- | | |
|---|--------|
| 1. Typical Angiosperm flower – morphology of floral organs | 1 hr. |
| 2. Anther - structure, dehiscence; microsporogenesis; male gametogenesis | 3 hrs. |
| 3. Ovule - structure, types; Megasporogenesis; Female gametogenesis: Monosporic, bisporic and tetrasporic. Structure of typical embryosac, Polygonum, Allium and Adoxa type | 7 hrs. |
| 4. Fertilization, syngamy, and triple fusion, double fertilization. | 1hr. |
| 5. Endosperm formation - Types - Free nuclear, cellular and helobial | 1hr. |
| 6. Embryo - Structure of Dicot embryo- Capsella type and Monocot embryo - Sagittaria | 3 hr. |
| 7. Polyembryony - causes, types and significance | 1 hr. |
| 8. Parthenocarpy – induction and importance | 1 hr. |

PRACTICAL

Total - 9 hours ($1\frac{1}{2}$ hour per week)

Students should identify-

1. Floral transition in Nymphaea
2. Datura anther T.S. (mature)
3. Types of ovules: Orthotropous, Anatropous and Campylotropous
4. Dicot and monocot embryo of Angiosperms (Slides only)

References

1. Bhojwani S & S.P. Bhatnagar 198. The Embryology of Angiosperms. Vikas Publishing House (P) Ltd.
2. Davis C.L. 1965. Systematic Embryology of Angiosperms. John Wiley, New York.
3. Eames M.S 1960. Morphology of Angiosperms Mc Graw Hill New York.
4. Johri BD 1984 (ed.) Embryology of Angiosperms Springer - Verlag, Berlin.
5. Maheswari P. 1985. Introduction to Embryology of Angiosperms - Mac Graw Hill, New York.
6. Sharam & Aswathi: Embryology of Angiosperms.
7. Agarwal S.B. Embryology of Angiosperms- a fundamental approach, Sahithya Bhavan, Hospital Road, Agra.
8. Singh V., P.C. Pande & D.K. Jain 2001; Embryology of Angiosperms- Rastogi Publications, 'Gangothri' Sivaji road, Meerut-

PALYNOLOGY (12 hrs.)

- | | | |
|----|---|--------|
| 1. | Palynology- Introduction, Scope and Significance | 2 hrs. |
| 2. | Pollen morphology – Acetolysis, Pollen wall features - fine structure, pollen kit substance; Pollinium. | 2 hrs. |
| 3. | Pollination - different types, mechanisms and contrivances | 2 hrs. |
| 4. | Pollen viability and pollen storage methods. | 3 hrs. |
| 5. | Applied palynology: Aeropalynology; Melitopalynology, Pollen and allergy; Role of pollen morphology in Taxonomy | 3 hrs |

PRACTICALS (Total - 7 hrs.)

1. Study the pollen morphology of Hibiscus, and pollinia of *Cryptostegia/ Calotropis* by acetolytic method
2. Viability test for pollen
 - a. in vitro germination using sugar solution. (cavity slide method)

- b. Tetrazolium test
- c. Acetocarmine test (Acetocarmine & Glycerine 1:1)

References

1. Erdtman G 1952. Pollen Morphology and plant Taxonomy Part I. Almqvist & Wicksell Stockholm
2. Erdtman G 1969. Hand Book of Palynology. National Botanical Gardens Publication, Lucknow.
3. Nair PKK 1970. Pollen Morphology of Angiosperms Vikas Publishing House, Delhi.
4. Saxena M.R. Palynology –A treatise-Oxford, I.B.H. New Delhi
5. Shivanna, K.R. & N.S. Rangaswami, 1993. Pollen Biollgy Narosa Publishing House - Delhi.
6. Shivanna & Johri. The Angiosperm Pollen.

ECONOMIC BOTANY (6 hrs)

Study the different category of economically important plants their Binomial,

Family and Morphology of useful part, products and uses:

1. Cereals and Millets – Rice, Wheat, Maize and Ragi
2. Pulses and legumes – Green gram, Bengal gram, Black gram,
3. Sugar – Sugar cane
4. Fruits – Apple, Pine Apple, Papaya, Banana, Mango, Guava, Jack, Grapes, Sapota.
5. Vegetables – Carrot, Beet Root, Corm, Potato, bitter gourd, Cucumber, Snake gourd, Ladies finger, Cabbage, *Amaranthus*,
6. Ornamentals – Rose, *Anthurium*, Jasmine.
7. Masticatories – Betel vine, Betel nut, Tobacco.

8. Beverages – Coffee, Tea, Cocoa.
9. Fibre – Coir, Cotton, Jute.
10. Timber – Teak, Rose wood, Jack, Ailanthus.
11. Fats and oils – Coconut, Gingelly, Sun flower.
12. Latex – Rubber
13. Gums and Resins – Dammar, Gum Arabic, Asafetida
14. Spices – Pepper, Ginger, Cardamom, Clove, Nutmeg, Allspice, Cinnamon
15. Medicinal – *Adhatoda*, *Catharanthus*, *Phyllanthus*, *Rauwolfia*, *Aloe*,

PRACTICALS (Total: 3 hrs)

1. Students shall be able to identify plants or plant products (raw or processed) studied in theory and shall be able to write Botanical names, Family and morphology of useful parts of source plants.
2. Students need not make any illustrations but make a table in the record giving the details of the items mentioned in the theory syllabus. 3 hrs.

ETHNOBOTANY [Theory: 6 hrs.]

1. Introduction, scope and significance
2. Major tribes of South India
3. Ethnobotanic significance of the following:
 1. *Aegle marmelos*
 2. *Ficus religiosa*
 3. *Curcuma longa*
 4. *Cynadon dactylon*
 5. *Ocimum sanctum*
 6. *Trichopus zeylanica*

PRACTICALS [Total: 3 hrs]

Students are expected to identify the plants mentioned in the Ethnobotany syllabus and it must be given as a table showing Common name, Binomial, Family and Ethnobotanical significance in the record book.

References

1. Jain. S. K. 1981. Glimpses of Indian Economic Botany. Oxford
2. Baker. H.g. 1970. Plant and Civilization.
3. Jain. S. K. 1995. A Manual of Ethnobotany. Scientific Publishers , Jodhpur.
4. Cotton, C.M. 1996. Ethnobotany – Principles AND Applications. Wiley and Sons.
5. Bendre Kumar 2000: Economic Botany' Rastogi Publications, Shivaji road, meerut.

HORTICULTURE Theory: 21 hours (1 ¼ hr. per week)**Module - I.**

1. Introduction, scope and significance; branches of horticulture.
2. Soil- components of soil, types of soil.
3. Fertilizers – Chemical, organic, biofertilizer, compost.
4. Pots & potting – earthen, fibre, polythene bags, potting mixture, potting, repotting, top dressing.
5. Irrigation – Surface, sprinkle, drip and gravity irrigation.

7 hrs.

Module - II

1. Seed propagation –seed quality tests, seed treatment, essential condition for successful propagation – raising of seed beds, transplanting techniques.
2. Vegetative propagation:
 - (a) Cutting (stem, roots)
 - (b) Grafting (approach, cleft)
 - (c) Budding (T-budding, patch)

- (d) Layering (simple, air).

7 hrs.

Module - III.

1. Gardening – site selection; propagating structure: green house, poly house, moist chamber, net frame – Garden tools and implements.
2. Indoor gardening – selection of indoor plants, care and maintenance of indoor plants, Bonsai – Principle, creating the bonsai.
3. Outdoor gardening; landscaping- goals, types.
4. Cultivation and post harvest management of vegetables and ornamental plants
5. Protection of Horticultural plants: Precautions to avoid pests and diseases. Bio pesticides
6. Mushroom cultivation – Oyster mushroom

7 hrs.

PRACTICALS Practical 14 hours

1. Preparation of nursery bed and polybag filling.
2. Preparation of potting mixture – Potting, repotting.
3. Field work in cutting, grafting, budding, layering.
4. Familiarizing gardening tools and implements.
5. Establishment of vegetable garden/ Visit to a horticulture station.
6. A brief report of item no. 5 may be recorded.
7. Students are expected to submit at least five articles/specimens/
photographs of horticultural significance at the time of practical
examination Paper-I

References

1. Nishi Sinha: Gardening in India, Abhinav Publications, New Delhi.
2. Andiance and Brison. 1971. Propagation Horticultural Plants.
3. Rekha Sarin. The Art of Flower Arrangement, UBS Publishers, New Delhi.
4. Katyal, S.C., Vegetable growing in India, Oxford, New York.

5. Naik, K.C., South Indian Fruits and their Culture.
6. Chanda, K.L. and Choudhury, B. Ornamental Horticulture in India.
7. Premchand, Agriculture and Forest Pest and their Management, Oxford Publication.
8. George Acquah, Horticulture: Principles and Practices. Pearson Education, Delhi.
9. Prasad, S., and U. Kumar. Green house Management for Horticultural Crops, Agrobios, Jodhpur.
10. Kumar, U.: Methods in Plant Tissue Culture. Agrobios (India), Jodhpur.
11. Kolay, A.K. Basic Concepts of Soil Science. New Age International Publishers, Delhi.
12. Bal, J.S., Fruit growing, Kalyani Publishers, Delhi.
13. Rodgran, M.K. Plant Tissue Culture, Oxford & IBH Publishing Ltd., New Delhi.
14. Nesamony, S. Oushadha Sasyangal (Medicinal plants), State Institute of Language, Kerala, Trivandrum.
15. Prakash, R and K. Raj Mohan, Jaivakrishi (Organic farming), State Institute of Languages, Trivandrum.
16. Hudson, T. Hartmann, Dale K. Kester, Fred T. Davies, Robert L. Geneve, Plant Propagation, Principles and Practices.
17. George Aquah 2005: Horticulture

**FIFTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME
CORE COURSE-8: GENERAL & BIOINFORMATICS, INTRODUCTORY
BIOTECHNOLOGY AND MOLECULAR BIOLOGY
Code: BOT5B08T**

[Total 99 hours: Theory 63, Practical 36]

GENERAL INFORMATICS & BIOINFORMATICS

Theory: 13 hrs. [3/4 hr. per week]

Module-I

1. Definition, salient features and scope of information technology.
2. Internet as a knowledge repository, data and metadata. Internet protocols – IP address and Domain Name System, URL.
3. Searching the internet: Browsers, search engines, Meta search engines, Boolean searching.
4. IT in teaching, learning and research: Web page designing and web hosting.
Academic web sites, e-journals, Open access initiatives and open access publishing, education software, academic services - INFLIBNET, NICNET, BRNET.

Module – II

1. IT and society- issues and concerns. The digital divide, the free software debate; The concept of Wiki. Wikipedia, Wiki dictionary, Wikimedia.
2. Social network sites, Orkut, Facebook, Linkedin, Google Plus, Twitter etc. Emerging trends, benefits, potential for misuse and hazards.
3. Cyber ethics, security, cyber crimes, cyber addiction, information overload.

20 hrs

MODULE –V

1. Transformation technology – Transgenic plant production, Gene transfer methods in plants, Multiple gene transfers, Vector less or direct gene transfer techniques. 7 hrs

References

1. Dixon, R.A. & R.A. Gonzales. 1994. Plant Cell Culture – A Practical Approach (2nd Ed) Oxford University Press.
2. Mantel & Smith (1983) Plant Biotechnology. Cambridge University Press
3. Mantel, S. H, Mathew, J.A. et al. 1985 An introduction to Genetic Engineering in plants. Blackwell Scientific Publishers, London.
4. Gupta, P.K. 1996. Elementary Biotechnology. Rastogi & Company, Meerut.
5. Hammond, J., Megary, P et al. 2000. Plant Biotechnology. Springer-Verlag.
6. Gamborg, O.L. & G.C. Philips (Eds.) 1995. Plant Cell, Tissue and Organ Culture Fundamental Methods. Narosa Publishing House, New Delhi.
7. einert & Bajaj Plant Cell, Tissue and Organ Culture.
8. Das, H.K. (Ed) 2005. Text book of Biotechnology (2nd ed) Wiley India (Pvt.) Ltd. New Delhi.

**SIXTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME
CORE COURSE- 9: GENETICS AND PLANT BREEDING**

Code: BOT6B09T

[Total 90 hours: Theory 54, Practical 36]

GENETICS Theory: 40 hrs.

Module - I

1. Introduction- Brief account of Mendel's life history: Mendelian experiments: Monohybrid cross and dihybrid cross, Mendelian ratios, Laws of inheritance; Back cross, test cross. 5 hrs.

2. Modified Mendelian ratios:

- a. Allelic interactions: dominant – recessive, Incomplete dominance - flower color in *Mirabilis*; Co dominance – Coat colour in cattle, Blood group in human beings; Lethal genes – Sickle cell anemia in Human beings.

5 hrs.

- b. Interaction of genes: Non epistatic - Comb pattern inheritance in poultry (9:3:3:1); Epistasis: dominant - Fruit colour in summer squashes; recessive epistasis - Coat color in mice; Complementary gene interaction- flower color in *Lathyrus* .

5 hrs.

3. Multiple alleles- general account: ABO blood group in man, Self sterility in *Nicotiana*, Coat colour in Rabbits.

3 hrs.

4. Quantitative inheritance / polygenic inheritance / continuous variation- Skin color in human beings, Ear size in maize.

3 hrs.

Module -II

1. Linkage and crossing over- importance of linkage, linkage and independent assortment. Complete and incomplete linkage. Crossing over- general account, 2 point and 3 – point crossing over, cytological evidence of genetic crossing over. Determination of gene sequences; interference and coincidence; mapping of chromosomes. 6 hrs.
2. Sex determination- sex chromosomes and autosomes- chromosomal basis of sex determination; XX-XY, XX-XO mechanism; sex determination in higher plants (*Melandrium album*); genic balance theory of sex determination in *Drosophila*; sex chromosomal abnormalities in man. 4 hrs.
3. Sex linked inheritance: X-linked, Y-linked; Eye color in *Drosophila*, Haemophilia in man; Y-linked inheritance; Sex limited inheritance. 3 hrs.
4. Extra nuclear inheritance- general account- maternal influence- plastid inheritance in *Mirabilis*, Shell coiling in snails. 3 hrs.

5. Population genetics; Hardy –Weinberg law and equation 3 hrs.

PRACTICAL

Total: 27 hours.

1. Students are expected to work out problems related to the theory syllabus and recorded.
 - a. Monohybrid cross
 - b. Dihybrid cross
 - c. Test cross and back cross
 - d. Determination of genotypic and phenotypic ratios and genotype of parents
 - e. Non epistasis
 - f. Complementary gene interaction
 - g. Epitasis: dominant and recessive
 - h. Polygenic interaction
 - i. Multiple allelism
 - j. Chromosome mapping
 - k. Calculation of Coincidence and interference

Reference:

1. Gunther, S. Spend & Richard Calender 1986 - Molecular Genetics CBS Publishers - Delhi.
2. Gupta, P.K. Text Book of Genetics. Rastogi Publications, Meerut.
3. John Ringo 2004- Fundamental Genetics Cambridge University Press.
- 3 Lewin B. 2000 Genes VII Oxford University Press.
- 4 RastogiV.B. 2008, Fundamentals of Molecular Biology, Ane Books, India.
6. Sinnot, W.L.C. Dunn & J. Dobzhansky 1996. Principles of Genetics. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
7. Taylor, D.J., Green, N.P.O. and Stout, G.W. Biological Science 3rd edn. Cambridge University Press.

8. Verma, P.S. & Agarwal 1999. Text book of Genetics. S. Chand & Co., New Delhi.

PLANT BREEDING Total: 14 hrs. [$\frac{3}{4}$ hr. per week)

Module-I

1. Definition and objectives of Plant breeding – Organization of ICAR and its role in plant breeding. 1 hr.
2. Plant Genetic Resources - Components of Plant Genetic Resources. 1 hr.

Module-II

1. Breeding techniques –
 - a. Plant introduction: Procedure, quarantine regulations, acclimatization-agencies of plant introduction in India, major achievements.
 - b. Selection - mass selection, pureline selection and clonal selection, genetic basis of selection, significance and achievements.
 - c. Hybridization – procedure; intergeneric, interspecific and intervarietal hybridization with examples; composite and synthetic varieties.
 - d. Heterosis breeding - genetics of heterosis and inbreeding depression.
 - e. Mutation breeding – methods,- achievements.
 - f. Polyploidy breeding
 - g. Breeding for disease and stress resistance 10 hrs.
2. Modern tools for plant breeding: Genetic Engineering and products of genetically modified crops (brief mentioning only). 2 hrs.

PRACTICAL 9 hrs

6. Goodwin Y.W., and Mercer E.I. (2003) Introduction to Plant Biochemistry. 2nd edition. CBS Publishers and distributors.
7. Donald Voet and Judith Voet. (2004). Biochemistry. 3rd edition. Wiley international edition.
8. Keith Wilson and John Walker.(2008). Principles and techniques of Biochemistry and Molecular Biology. 6th edition. Cambridge University Press.
9. Trevor Palmer. Enzymes- Biochemistry, Biotechnology and Clinical Chemistry. Norwood Publishing, Chichester.
10. Donald Voet and Judith Voet. (2004). Biochemistry. 3rd edition. Wiley international edition.

SIXTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME

CORE COURSE-12: ENVIRONMENTAL SCIENCE

Code: BOT6B12T

[Total 72 hours: Theory 54, Practical 18]

ENVIRONMENTAL SCIENCE Theory-54 Hrs. [3hrs. per week]

Module - I

1. Ecosystem – Definition ; abiotic and biotic factors; trophic structure; Food chain and food web; Ecological pyramids; Energy flow; Productivity of ecosystems.
 2. Biogeochemical cycles (Carbon, Nitrogen, Phosphorous)
 3. Plant adaptations: Adaptations in Hydrophytes, Xerophytes, Halophytes, Epiphytes and Parasites.
 4. Plant Succession: Definition – Primary and Secondary succession; Autogenic and allogenic succession; Mechanism of plant succession–Xerosere and Hydrosere
- 15 hrs.

Module-II

1. Biodiversity and Conservation: Definition; Biodiversity - Global and Indian Scenario; Megadiversity nations and hotspots: Biosphere reserves; Biodiversity centres in India.
2. Threats to biodiversity; Endangered and endemic plant species – Red data book - Exotic and indigenous plant species – Keystone species – Flagship species.
3. Conservation strategies ex situ and in situ methods. Organizations – IUCN, UNEP & WWF; (NBPGR) Biodiversity Board of Kerala (KSBDB).
10 hrs.

Module-III

1. Pollution: Sources and types of pollution – air, water, soil, thermal and noise; biodegradable and non-biodegradable pollutants; biomagnifications; BOD.
2. Global environmental changes – climatic changes – global warming and greenhouse gases – acid rains – el-nino – Efforts of world organizations in the regulation of green house gases emission.
3. Management of environmental pollution – conventional and phytotechnological approaches – solid wastes management including e-wastes-environmental legislations in India (Prevention and Control of Pollution act, 1981). 15 hrs.

Module- IV

1. Major ecosystems of the Biosphere; Sea; Estuarine ecosystem; Lentic ecosystem: lake, Pond; Lotic ecosystem: river; Desert; Forest; grass land.
2. Techniques in plant community studies – Quadrat and transect methods – species area curve – density, frequency, abundance, dominance of populations – importance value index – construction of phytographs. 14 hrs.

PRACTICALS [Total: 18 Hrs.]

1. Construct a food web from the given set of data, (Representative of a natural ecosystem).
2. Construct ecological pyramids of number, biomass, energy from the given set of data, (Representative of a natural ecosystem).

3. Study of plant communities – Determination of density, abundance, dominance, frequency by quadrat method.
4. Demonstration of determination of Dissolved Oxygen by Winkler's method.
5. Study of morphological and anatomical characteristics of plant groups – Hydrophytes, Xerophytes, halophytes, epiphytes, parasites.

References

1. Ahluvalia V.K. Malhotra S. 2009. Environmental Science. Ane Books – New Delhi.
2. Ambasht R.S. 1988. A text book of Plant Ecology. Students Friends Co.Varanasi.
3. Beeby A. & Brennan A.M. First Ecology. Ecological Principles and Environmental Issues. International Student Edition.
4. Benon E. Plant Conservation Biotechnology. Taylor & Francis Ltd. II New Felter Lane, London. EC4P4EE.
5. Cunningham W.P. and M.A. Cunningham 2003. Principles of Environmental Science: Inquiry and Applications. Tata McGraw Hill Pub. N.D.
6. Dash M.C. 1993. Fundamentals of Ecology. Tata McGraw Hill Publishing Company Ltd. New Delhi.
7. Dix J.H. 1989. Environmental Pollution. Atmosphere, Land, Water and Noise. Wiley Chichester.
8. Khitoliya R.K. 2007. Environmental Pollution – Management and Control for Sustainable development S. Chand and Company Ltd., New Delhi.
9. Kumar H.D. 1977. Modern Concepts of Ecology. Vikas Publications. New Delhi.
10. Michael S. 1996. Ecology. Oxford University Press, London.
11. Mishra D.D 2008. Fundamental Concepts in Environmental Studies. S. Chand & Co., New Delhi.
12. Mishra S.P. & S.N. Pandey 2008. Essential Environmental Studies. Ane Books Pvt. Ltd. Thiruvananthapuram.
13. Odum E.P. 1983. Basics of Ecology. Saunders International UN Edition.
14. Shukla R.S. & P.S. Chandel 2005. A Text Book of Plant Ecology S. Chand & Co. Ltd. New Delhi.
15. Wise D.L. 2005. Global Environmental Biotechnology. Ane Books. Trivandrum.
16. Bharucha E. 2005. Text Book of Environmental Studies for UG courses. University Press (India) Private Limited Hyderabad.
17. Archibold. O.W. 1995. Ecology of World Vegetation. Chapman & Hall, London.

18. Diamond, J., T.J. Case 1986. Community ecology. Harper & Row, New York.
19. Futuyma P.J., Slatkin M. 1983. Co-evolution. Sinauer Associates, Sunderland, Mass.
20. Krebs, C.J. 1985. Ecology 3rd edn. Harper & Row New York.
21. Sharma, P.D. 2008-2009. Ecology and Environment. Rastogi Publication.
22. Shukla R S & P.S. Chandal 2008: Ecology and utility of plants' S. Chand & Company Ltd. New Delhi.

ELECTIVE PAPERS

References

1. Recombinant DNA , JD Watson, 1992, Scientific American Books
2. Recombinant DNA: genes and genomes – a short course, JD Watson et al., 2006, WH Freeman & Co.
3. Recombinant DNA technology and applications, Alex Prokop et al., 1997, McGraw Hill.
4. Principles of Gene Manipulation: An Introduction to Genetic Engineering, by [R.W. Old](#) and [S.B. Primrose](#), 2000, Blackwell Scientific
5. Molecular Cloning: a Laboratory Manual.. Sambrook J, Russel DW & Maniatis T. 2001, Cold Spring Harbour Laboratory Press.

SIXTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME

CORE COURSE-11: ELECTIVE-2: ADVANCED ANGIOSPERM SYSTEMATICS

Code: BOT6B11T

[Total: 90 hrs. Theory: 54 hrs. , Practical: 36 hours]

Module -I Principles of Angiosperm Taxonomy

1. Scope and importance of Taxonomy.
2. The history of taxonomy- Ancient classification; Evolution of different concepts in taxonomy. The herbalists; Early taxonomists; Linnaeus; Post Linnaean natural systems; Post Darwinian phylogenic; Modern Phenetic methods (Numerical taxonomy); Modern Phylogenic methods (Cladistics). APG system of classification (Brief account only)

12 hrs.

Module-II The material basis of Systematics

1. Concept of character; Correlation of characters; character weighting; Character variation, isolation and speciation.

2. Sources of Taxonomic characters: Morphology, Anatomy, Palynology, Embryology, Cytology, Phytochemistry, Molecular Taxonomy. Role of the above mentioned branches in taxonomic studies
3. Identification techniques: Taxonomic literature: Flora, Revision, monograph, use and construction of taxonomic keys. Herbarium: Definition, Steps involved in preparation and maintenance of herbarium, Herbarium consultation; General account of Regional and National herbaria with special emphasis to Kew, CAL, MH, CALI.
4. Botanic gardens and their importance in taxonomic studies – Important National and International Botanic Gardens – Royal Botanic Gardens, Kew; Indian Botanic Gardens, Calcutta; National Botanic Garden, Lucknow; Tropical Botanic Garden, Trivandrum; Malabar Botanic Garden, Calicut.
5. Digital resources in taxonomy: Softwares, Databases, Online tools; use of TROPICOS, IPINI, Virtual herbaria, Digital flora/databases of Flora of Kerala. 22 hrs

Module – III Plant Nomenclature

1. History of nomenclature – Polynomial and binomial systems
2. Brief outline of ICBN
3. Major rules; Typification; Rule of priority; Effective and valid publication; author citation 5 hrs.

Module – IV Taxonomic review of selected families

Critical study of the following families with emphasis on identification of local members using flora, economic importance, inter relationships and evolutionary trends: Nymphaeaceae, Capparidaceae, Sterculiaceae, Meliaceae, Combretaceae, Lythraceae, Scrophulariaceae, Convolvulaceae, Bignoniaceae, Verbenaceae, Amaranthaceae, Urticaceae, Amaryllidaceae, Arecaceae, Cyperaceae 15 hrs

Practicals: 36 hrs.

{ The entire 90 hours of Elective paper must be treated as theory hours. Practical hours allotted for Elective courses cannot be considered for calculating work load. Practicals may be done during theory classes }

1. Identification of locally available plants belonging to the families mentioned under module - IV using local floras.
2. Familiarize local flora and study the preparation of taxonomic keys and taxon card for plants coming under the families in module IV.
3. **Students must workout at least one member of the every families mentioned in module IV, and has to make suitable sketches/illustrations manually or digitally, and record the same for valuation at the time of Practical examination as part of submission.**

References

1. Heywood, V H & Moore, D M. (Eds) 1984. Current concepts in Plant Taxonomy
2. Lawrance, G H M. Taxonomy of vascular plants. Oxford & IBH
3. Sivarajan, V V. 1991. Introduction to principles of plant Taxonomy. Oxford & IBH.
4. Vasishta, P C. Taxonomy of Angiosperms. R. Chand & Co. New Delhi.
5. Singh, V & D K Jain. 1997. Taxonomy of Angiosperms. Rastogi Publications, Meerut.
6. Stace, C A. 1989. Plant Taxonomy and Biosystematics. Edward Arnold, London
7. Henry & Chandrabose. 1997. An aid to International code of Botanical Nomenclature. BSI.

SIXTH SEMESTER B. Sc. BOTANY DEGREE PROGRAMME

CORE COURSE-11: Elective-3 GENETICS AND CROP IMPROVEMENT**Code: BOT6B15T**

[Total: 90 hrs. Theory 54 hrs. , Practical: 36 hours]

Module -1.

Crop genetics - General account of origin, genetic variability, floral biology, breeding techniques and achievements in: Rice, Coconut, Rubber, Arecanut, Cashew and Pepper 10 hrs

Module –II

1. Plant genetic resources - Definition; Classification of Plant Genetic Resources. Activities – exploration, conservation, evaluation, documentation and utilization.
2. Agencies involved in plant genetic resources activities – NBPGR and IPGRI
3. International institutes for crop improvement – IRRI, ICRISAT, CIMMYT, IITA. Brief account on research activities and achievements of national institutes – IARI, CCMB, IISc, BARC, CPCRI, IISR, RRII, CTCRI, KFRI, TBGRI 8 hrs.

Module- III

1. Methods of crop Improvement : a. Plant introduction b. Selection - Principles, Selection of segregating populations, achievements c. Hybridization – Interspecific hybridization; intergeneric – achievements. Genetics of back crossing, Inbreeding, Inbreeding depression, Heterosis and Heterobeltiosis 4 hrs.

Module - IV.

2. Cuttler, E.G. 1971. Plant Anatomy, Part III Organs Edward Arnold Ltd., London.
3. Esau K. 1985. Plant Antomy (2nd ed.) Wiley Eastern Ltd. New Delhi.
4. Pandey B.P. Plant Anatomy, S. Chand & Co. Delhi.
5. Vasishta P.C. 1974. Plant Anatomy, Pradeep Publication, Jalandhar.
8. Tayal M.S Plant Anatomy. Rastogi Publishers, Meerut.

References: Microtechnique

1. Johansen, D.A. 1940. Plant Microtehnique. Mc Graw – Hill Book Company, Inc. New York.
2. Kanika, S. 2007. Manual of Microbiology – Tools and Techniques. Ane's student edition.
3. Khasim,S.K., 2002. Botanical Microtechnique; principles and Practice, Capital Publishing Company, New Delhi.
4. Toji, T. 2004. Essentials of botanical microtechnique. Apex Infotec Publ.

SECOND SEMESTER COMPLEMENTARY BOTANY

Course Code: BOT2C02T

CRYPTOGAMS, GYMNOSPERMS & PLANT PATHOLOGY

Total: 72 Hours (Theory: 36 hours, Practical: 36 hours)

Cryptogams, Gymnosperms & Plant Pathology

Theory: 32hrs..

Module - I

1. Virus: General account of viruses, including structure of TMV & Bacteriophage. 2 hrs.

2. Bacteria: Classification based on shape of flagella, structure, nutrition (brief account), reproduction and economic importance - agriculture, industry and medicine. 3 hrs.
3. Cyanobacteria: General Account structure, life - history and economic importance of Nostoc 2 hrs.

Module - II

1. Phycology: General characters, classification, evolutionary trends in algae.
2. Structure, reproduction, life history and economic importance of the following classes with suitable examples:
 - a) Chlorophyceae (Spirogyra)
 - b) Phaeophyceae (Sargassum)
 - c) Rhodophyceae (Polysiphonia). 7 hrs.
3. Mycology: General characters, classification (Alexopoulos, 1979). (brief mention only) and evolutionary trends in fungi.

Important features of the following divisions:

 - a) Mastigomycotina
 - b) Ascomycotina
 - c) Basidiomycotina.
4. Structure and life history of Puccinia (developmental details not required) 4 hrs.

Module - III

1. Bryology: General account, morphology and life - history of Riccia. 4 hrs.
2. Lichenology: General account and economic importance of Lichens with special reference to Usnea. 3 hrs.

3. Pteridology: General account, morphology and life history of Selaginella
4 hrs.
4. Gymnosperms: General account, morphology and life history of Cycas (Anatomy not required)
4 hrs.

Module - IV

1. Plant Pathology: Study the following plant diseases with special reference to pathogens, symptoms, method of spreading and control measures.
1) Leaf mosaic of Tapioca 2) Citrus canker 3) Blast of paddy 3 hrs.

Practicals: 32hrs.

1. Make suitable micro preparations of vegetative and reproductive structures of Sargassum, Puccinia, Riccia and Selaginella
2. Identify and draw labelled diagrams of the types mentioned in the syllabus.

Plant pathology

Practical: 4 hrs.

1. Identify the diseases (mentioned in the theory syllabus) on the basis of symptoms and causal organisms.

References: Cryptogams

1. Fritsch, F.E. 1935. The structure and reproduction of the algae. Vol. 1 and II, Uni. Press. Cambridge.
2. Morris, I. 1967. An Introduction to the algae. Hutchinson and Co. London.
3. Papenfuss, G.F. 1955. Classification of Algae.
4. B.R. Vasishta. Introduction to Algae
5. B.P. Pandey Algae

6. Mamatha Rao, 2009 – Microbes and Non-flowering plants. Impact and applications. Ane Books, New Delhi.
7. Sanders, W.B. 2001. Lichen interface between mycology and plant morphology. Bioscience, 51: 1025-1035.
8. B.R. Vasishta. Introduction to Fungi.
9. P.C. Vasishta Introduction to Bryophytes.
10. B.P. Pandey Introduction to Pteridophytes

References: Gymnosperms

1. Chamberlain C.J., 1935, Gymnosperms – Structure and Evolution, Chicago University Press.
2. Sreevastava H.N. 1980, A Text Book of Gymnosperms. S. Chand and Co. Ltd., New Delhi.
3. Vasishta P.C. 1980, Gymnosperms. S. Chand and Co., Ltd., New Delhi.

References: Plant Pathology

1. Agros, G.N. 1997. Plant Pathology (4th ed) Academic Press.
2. Bilgrami K.H. & H.C. Dube. 1976. A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.
3. Pandey, B.P. 1999. Plant Pathology. Pathogen and Plant diseases. Chand & Co. New Delhi.
- 4.

THIRD SEMESTER COMPLEMENTARY BOTANY

Course Code: BOT3C03T

MORPHOLOGY, SYSTEMATIC BOTANY, ECONOMIC BOTANY,

PLANT BREEDING AND HORTICULTURE

Total: 90 Hours (Theory: 54 hours, Practical: 36 hours)

Morphology

Theory: 8 hrs.

Module - I

1. Leaf – Structure, simple, compound, venation and phyllotaxy.
2. Inflorescence - racemose, cymose, special, types with examples
3. Flower - as a modified shoot- structure of flower - floral parts, their arrangement, relative position, cohesion and adhesion of stamens, symmetry of flowers, types of aestivation and placentation, floral diagram and floral formula. 8 hrs.

Practicals: 4 hrs.

1. Identify the different types of inflorescence included in the syllabus and record the same 4 hrs.

Reference:- Morphology

1. Sporne, K.R. 1974. Morphology of Angiosperms. New Delhi.

Systematic Botany

Theory; 28 hrs.

Module- I

1. Introduction, scope and importance 1hr.
2. Herbarium techniques: collection, drying, poisoning, mounting & labelling. Significance of herbaria and botanical gardens; Important herbaria and botanical gardens in India. 4 hrs.
3. Nomenclature - Binomial system of nomenclature, basic rules of nomenclature (validity, effectivity and priority), International Code of Botanical Nomenclature. 3 hrs.
4. Systems of classification - Artificial, Natural of Phylogenetic (Brief account only). Bentham & Hooker's system of classification in detail. 4 hrs.

5. Modern trends in taxonomy - Chemotaxonomy, Numerical taxonomy and Cytotaxonomy (brief account only) 2 hrs.
6. Study the following families: Malvaceae, Fabaceae (with sub-families) Rubiaceae, Apocynaceae, Euphorbiaceae and Poaceae. 14 hrs.

Systematic Botany

Practical: 20hrs.

1. Determine the systematic position of local plants comes under the syllabus based on their vegetative and floral characters
2. Students shall be able to describe the plants in technical terms and draw the L.S. of flower, floral diagrams and the floral formula of two plants belong to each family and record the same.
3. Students are expected to submit ten properly identified duly certified herbarium specimens belonging to families included in the syllabus during the practical examination.

References: Systematic Botany

1. Radford, A.E. 1986. Fundamentals of Plant Systematics. Harpor & Row Publishers, New York.
2. Sivarajan, V.V. 1991. Introduction to Principles of Plant Taxonomy. Oxford & IBH, New Delhi.
3. Jeffrey, C. 1968. An introduction to Plant Taxonomy, London
4. Gurucharan Singh, 2001. Plant Systematics. Theory and practice. Oxford & IBH Publications New Delhi.
5. Sharma O.P. 1990, Plant Taxonomy – Tata McGraw Hills. Publishing company Ltd
6. Subramanyam N.S. Modern Plant Taxonomy. Vikas Publishing House Pvt Ltd.
7. Pandey & Misra. Taxonomy of angiosperms. Ane books Pvt Ltd.

Economy Botany [Theory: 4 hrs.]**Module -I**

1. Brief account on the various categories of plants based on their economic importance
2. Study the following plants with special reference to their binomial, family, morphology of the useful part and their uses.
 1. Cereals - Paddy, Wheat
 2. Pulses - Black gram, Green gram
 3. Oil - Coconut, Gingelly
 4. Fibre - Cotton
 5. Latex - Rubber
 6. Beverages - Tea, Coffee
 7. Spices - Pepper, Cardamom, Clove
 8. Medicinal plants – *Rauwolfia serpentina*, *Justicia adhatoda*,
Santalum album and *Curcuma longifolia*.

Practical: 4 hrs.

1. Identify at sight the economically important plant produces and products mentioned in module III, and learn the binomial and family of the source plants, morphology of the useful parts and uses.

References: Economic Botany

1. Pandey B. P (1987) - Economic Botany
2. Verma V. (1984) - Economic Botany
3. Hill A.W (1981) - Economic Botany, McGraw Hill Pub

Plant Breeding

Theory: 7hrs.

1. Objectives of plant breeding
2. Methods of plant breeding: a) Plant introduction b) Selection - Mass, Pure line and clonal, c) Hybridization : intervarietal, interspecific and intergeneric hybridization. d) Mutation breeding e) polyploidy breeding and f) reeding for disease resistance

Practical: 4 hrs.

1. Demonstration of hybridization technique

References: Plant Breeding

1. Allard. R.W. 1960. Principles of Plant breeding, John Wiley & Sons, Inc, New York.
2. Singh, B.D. 2005. Plant Breeding - Principles & methods , Kalyani Publishers, New Delhi.
3. Chaudhari. H.K. Elementary Principles of Plant breeding, Oxford & IBH Publishers.

Horticulture [Theory: 7 hrs.]

1. Horticulture- introduction: definition, branches, significance
2. Methods of plant propagation:
 - a. Seed propagation
 - b. Vegetative propagation
 1. Cutting – stem, root, leaf
 2. Layering –air layering
 3. Grafting: Approach grafting, Tongue grafting
 4. Budding: Patch and T-budding

Practical: 4 hrs.

1. Demonstration of layering, grafting and budding

References:- Horticulture

1. Text book of Horticulture - K. Manibhushan Rao - Macmillan India Ltd.
2. Introduction to Horticulture – N. Kumar (First Edition, Rajalakshmi Publication,1996)

**FOURTH SEMESTER COMPLEMENTARY BOTANY
PLANT PHYSIOLOGY, ECOLOGY AND GENETICS**

Course Code: BOT4C04T

Total: 90 Hours (Theory: 54 hours, Practical: 36 hours)

PLANT PHYSIOLOGY

[Theory: 36 hours]

Module - I

1. Structure of plant cell and cell organelles (Brief account only)
2. Water relations - Permeability, Imbibition, Diffusion, Osmosis and water potential
3. Absorption of water- Active and passive mechanisms
4. Ascent of sap -Root pressure theory, Transpiration pull or cohesion-tension theory.
5. Transpiration -Types, mechanism of stomatal movement: K⁺ ion theory, significance of transpiration, antitranspirants.

12 hrs.

Module - II

1. Photosynthesis-Introduction, significance, Two pigment systems, red drop,

Emerson enhancement effect, action and absorption spectra.

Mechanism of photosynthesis - Light reaction, cyclic & non-cyclic photo phosphorylation,

Dark reactions—Calvin cycle, C₄ cycle, photorespiration (a brief account only).

Factors affecting photosynthesis.

2. Respiration-Definition, Kinds of respiration-aerobic and anaerobic;

Glycolysis, Krebs cycle, Terminal oxidation, Fermentation

15 hrs.

Module - III

1. Plant growth-Definition, phases of growth, natural plant hormones, synthetic auxins (Brief account only)
2. Senescence and abscission, Photo-periodism & vernalization.
3. Dormancy of seeds- Factors causing dormancy, photoblastin, techniques to break dormancy, physiology of fruit ripening.

9 hrs.

Practicals - 18 hours

Learn the principle and working of the following apparatus/experiments

1. Thistle funnel osmoscope
2. Ganong's potometer
3. Ganong's light-screen
4. Ganong's respirometer
5. Absorbo transpirometer
6. Kuhne's fermentation vessel
7. Mohl's half-leaf experiment
8. Experiment to demonstrate suction due to transpiration

9. Experiment to show evolution of O₂ during photosynthesis

References:

1. William G. Llopkins, (1999). Introduction to Plant Physiology, 2nd edition, John Wiley & Sons, Inc.
2. Frank B. Salisbury and Cleon W. Ross (2002). Plant Physiology 3rd edition. CBS publishers and distributors.
3. G. Ray Noggle and George J. Fritz Introductory Plant Physiology Prentice Hall.
4. Goodwin Y.W., and Mercer E.I. (2003) Introduction to Plant Biochemistry. 2nd edition. CBS Publishers and distributors.

PLANT ECOLOGY

[Theory: 9 hours]

Module - I

1. Ecology-Definition, Ecosystem: ecological factors –biotic and abiotic. 2 hrs.
2. Ecological adaptations: Morphological, anatomical and physiological adaptations of the following types: Hydrophyte (Vallisnaria, Hydrilla), Xerophyte (Opuntia, Nerium), Halophyte (Avicennia), Epiphytes (Vanda) and parasites (Cuscuta). 4. hrs.
3. Ecological succession –Process of succession, types of succession, Hydrosere 3. hrs.

Practicals

Total: 9 hrs.

Study the morphological and anatomical adaptations of the hydrophytes, xerophytes, halophytes, epiphytes and parasites mentioned in the syllabus

References:

1. Ambasht R.S. 1988. A text book of Plant Ecology. Students Friends Co. Varanasi.
2. Dash M.C. 1993. Fundamentals of Ecology. Tata McGraw Hill Publishing Company Ltd. New Delhi.
3. Michael S. 1996. Ecology. Oxford University Press, London.
4. Sharma, P.D. 2008-2009. Ecology and Environment. Rastogi Publication.
5. Kumar H.D. 1977. Modern Concepts of Ecology. Vikas Publications. New Delhi.

GENETICS

Theory: 9hrs.

1. Introduction and brief history of genetics
2. Mendel's experiments, symbolisation, terminology, heredity and variation;
3. Monohybrid cross, Dihybrid cross, Laws of Mendel, test cross and back cross.
- 4.. Modified Mendelian ratios 1) Incomplete dominance in *Mirabilis jalapa*
5. Gene interactions: Complementary genes -flower colour in *Lathyrus odoratus* (9:7ratio), Epistasis - Fruit colour in *Cucurbita pepo* (12:3:1 ratio).

Practical: 9 hrs.

1. Students are expected to work out problems related to Monohybrid, Dihybrid, Test cross, Incomplete dominance and Modified Mendelian ratios and has to be recorded.

References: - Genetics

1. Sinnot, W.L.C. Dunn & J. Dobzhansky 1996. Principles of Genetics. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
2. Verma, P.S. & Agarwal 1999. Text book of Genetics. S. Chand & Co., New Delhi.
3. Rastogi V.B. 2008, Fundamentals of Molecular Biology, Ane Books, India.
4. Gupta, P.K. Text Book of Genetics. Rastogi Publications, Meerut.

MODEL QUESTIONS

First Semester Complementary Botany

ANATOMY & MICROTECHNIQUE

Course Code: BOT1C01T

Time: 3hrs

Max. 64 marks

Part A

(Answer all questions)

1. Quiescent centre is found in -----
2. Casparian strips occur in -----
3. Proponent of Kopper-Kappe theory
4. Calcium carbonate crystals are found as -----
5. Name a dicot plant showing anomalous secondary growth
6. Type of stomata in *Ixora* is -----
7. Name a fixative agent
8. Roughness of grass leaf is due to the presence of
9. Give the expansion of FAA
10. Growth of cells wall is accomplished by -----

10x1=10 marks

Part B

(Answer any seven questions)

11. What are tyloses? Mention their function
12. What are annual rings?

B. Voc Programme in Agriculture

Detailed Syllabus

SEMESTER I

Course No. 1.3

Course Code: GEC1ES03

Course Title: Fundamentals of Environmental Science

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives:

- To enable the students to acquire knowledge on the importance of Environmental Science
- To equip the students as volunteers to guard the environment.

MODULE 1 (15 Hours)

1. Methodology and perspective of science. Types of knowledge, practical, theoretical and scientific knowledge. What is science, what is not science – Hypothesis – Theories and laws of science, observations, evidences and proofs.

2. Definition, Scope and Importance of Environmental Science: Multidisciplinary nature of the environmental Science; Scope and importance; Need of Environmental awareness Interrelationship of ecology with other disciplines. Introduction to global environmental problems.

3. Components of the environment:

a. The atmosphere or the air: Layers of Atmosphere , Composition of air; importance of atmosphere, meteorological conditions and air circulation.

b. The hydrosphere or water: Importance of water, distribution of fresh water at global, national and state level. Hydrological Cycle.

c. Lithosphere or the rock and the soil: Elementary composition of rocks in the earth crust.

Types of rocks; Process of soil formation: Physical weathering, Chemical weathering of rocks; Role of soil in shaping the biosphere

MODULE 2 (15 Hours)

1. Environmental Factors:

a. Climatic Factors-Light, Temperature of Air (atmospheric temperature), Rainfall (precipitation), Humidity of air, atmosphere (gases and wind), fire.

b. Topographic Factors: height of mountains, direction of mountains and valleys, steepness of slope and exposure of slope

c. Edaphic factors: Soil-formation, soil profile, soil erosion, soil conservation

d. Biotic factors: Intraspecific interactions; Interspecific interactions: Neutralism, Commensalism, Mutualism, Parasitism, and Predation.

e. Ecological adaptations of plants (Hydrophytes, mesophytes, xerophytes, and halophytes) and animals (aquatic conditions-hydrocoles; amphibious conditions or sec. hydrocoles), terrestrial (mesocoles and xerocoles)

MODULE 3 (15 Hours)

Ecosystem: Definition; Components of ecosystem; Abiotic components: Light, Temperature, Pressure, Water, Wind, Soil; Biotic components: Energy flow in an ecosystem: Primary production, Secondary production; Food chain: Grazing food chain, Detritus food chain; Ecological pyramids: Pyramid of number, Pyramid of biomass, Pyramid of energy; Food web; Ecological indicators. Biogeochemical cycles: a) Gaseous cycles: Oxygen cycle, Carbon cycle and Nitrogen cycle. b) Sedimentary cycles: Phosphorus cycle, Sulfur cycle.

MODULE 4 (15 Hours)

Population Ecology and Community Ecology: Population characteristics- Population growth and its dynamics; natality, mortality, growth patterns; Age distribution, Malthusian theory; Community structure, succession and climax, Species diversity, ecological dominance, ecotone, niche, guild, edge effect, ecological equivalent, succession and climax

Major Ecosystems: Terrestrial Ecosystem-Forest, grass land, arid, crop land

Wet land-Ponds, lakes, rivers, oceans, estuaries

Major terrestrial Biomes-Tropical Savannah, Tropical rain forest and deserts

References

Ecology and Environment ,2008-2009.P. D. sharma (Rastogi Publications, Meerut)

A text book of Environmental Studies.,2006.D.K.Asthana, Meera Asthana (S.Chand&Co.)

Essential Environmental Studies,2009.S.P.Misra,S.N.Pandey,(Ane Books Pvt.Ltd,Chennai)

Environmental Education – A Conceptual Analysis. P.Kelu,University of Calicut publication

Text Book of Environmental Studies, Erach Bharucha, 2005.Orient Longman Pvt.

Ltd., Ernakulam

Course No. 1.4

Course Code: SDC1AG01

Course Title: Fundamentals of Agronomy

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives:

- To enable the students to acquire knowledge on importance of agriculture and various types of farming.
- To study the fundamentals of agronomy and classification of field crops

MODULE 1

12 Hrs

Importance of agriculture in India and Kerala, Hunger and food security, Agronomy, Sustainable agriculture, Subsistence agriculture, commercial agriculture, Extensive and intensive agriculture,

Peasant farming, Urban agriculture, Agribusiness, Agricultural seasons in India and Kerala, Rainfed and irrigated agriculture.

MODULE 2

12Hrs

Agricultural classification of crops, Agronomic classification of crops, Botanical classification of crops, Major farming systems in Kerala and Cropping Intensity, Methods of sowing/planting - planting geometry and its effect on growth and yield.

MODULE 3

12Hrs

Soil and climatic requirements, varieties, cultural practices, special systems of cultivation, harvesting and processing of major cereals and millets, pulses, tubercrops, rice, maize, finger millet, cowpea, tapioca, sweetpotato, amorphophallus, yams, coleus, arrowroot etc

MODULE 4

12Hrs

Soil productivity and fertility. - Crop nutrition - nutrients -classification - Nutrient sources- organic manures -fertilizers - biofertilizers .Nutrient recycling through manures and fertilizers - organic manures. Fertilizers and fertilizer use- management of fertilizers .Biological nitrogen fixation, Green manure crops and cover crops .Integrated Nutrient Management.

MODULE 5

12Hrs

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition. Water resources and in India and Kerala. Irrigation methods - drip and sprinkle irrigation systems. Water management of different crops like rice, banana, coconut, cowpea, and vegetables.

Text Books:

1. Balasubramaniyan, P and Palaniappan, S.P. 2001. *Principles and Practices of Agronomy* AgroBios(India)Ltd., Jodhpur.
2. Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology : An Analysis of World Food Production Systems*. W.H. Freeman and Company, San Francisco
3. De, G.C.1989.*Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.
4. Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.
5. Harlan, J.R. 1992. *Crops and Man*. American Society of Agronomy & Crop Science Society of America, Madison, WI.
6. Havlin, J. L., Beaton, J. D., Tisdale, S.L., and Nelsothn, W.L. 2006. *Soil Fertility and Fertilizers: An Introduction to Nutrient Management* (7 ed.). Pearson Education, Delhi.
7. ICAR.2006. *Hand book of Agriculture*, ICAR, New Delhi.
8. Janick, J., Schery, R.W., Woods, F.W., and Ruttan, V.W. 1974. *Plant Science: An Introduction to World Crops*. W.H. Freeman and Company, San Francisco.
9. Noor Mohammed.1992. Origin, diffusion and development of agriculture. In: Noor Mohammed (ed.), *New Dimensions in agricultural geography: Vol.1.Historical Dimensions of agriculture*. Concept publishing Co., New Delhi.pp29-75.
10. Reddy.T.Y and Reddy, G.H.S.1995.*Principles of Agronomy*, Kalyani Publishers, Ludhiana.

11. Chatterjee, B.N. and Maiti, S.1985.*Principles and Practices of Rice Growing*. Oxford & IBH Publishing Co., New Delhi.

Course No. 1.5

Course Code: SDC1AG02

Course Title: Fundamentals of Horticulture

Credits: 4

Total Contact Hrs: 60Hrs

Objectives

- To acquaint with importance, division and classification of horticultural crops.
- To understand the basic principles and types of plant propagation.

MODULE 1

12 Hrs

Horticulture - definition, importance, division and classification of horticultural crops. Importance of horticulture in India and Kerala. Orchard planning, layout, planting systems - management practices. Tree forms and functions - Training and pruning in horticultural crops - principles and methods, techniques of training and pruning, fruit thinning.

MODULE 2

12Hrs

Phases of growth and development - vegetative/ reproductive balance; Flowering in plants - bearing habit and its classification- factors associated with flowering and fruit set. Fruit set and development - structure and process concerned with setting. Fruit drop - factors affecting and control measures - unfruitfulness - internal and external factors. Seedlessness in horticultural crops; significance and induction.

MODULE 3

12 Hrs

Plant propagation - definition and basic concepts, sexual and asexual types - advantages and disadvantages. Media, containers, potting, re potting and pre planting treatments. Asexual propagation - propagation by cuttings, types of cuttings, factors affecting rooting of cuttings. Propagation by layering - types of layering.

MODULE 4

12 Hrs

Propagation by grafting - methods of grafting - development of graft unions, separation and after care. Stock-scion relationship - Graft incompatibility - factors affecting incompatibility. Propagation by budding, methods of budding - A comparative study between grafting and budding.

MODULE 5

12 Hrs

Nursery - site selection, layout - components of a nursery - production unit, sales unit, display area, management and maintenance, propagation unit - close planted progeny orchards. Plant propagating structures-.greenhouse, glasshouse, hot bed, cold frame, lath house, net house, mist chamber.

Text books:

1. Bose, TK., Mitra, SK. and Sadhu, K. 1986. *Propagation of tropical and subtropical horticultural crops*. NayaProkash, Calcutta.
2. Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
3. Edmond, JB., Sen, TD, Andrews, TS and Halfacre, RG. 1977. *Fundamentals of Horticulture*. Tata McGraw Hill, New Delhi.
4. Hartmann, HT. and Kester, DE. 1986. *Plant propagation - Principles and practices*. Prentice-Hall, New Delhi.
5. Leopold, A.C. and Kriedeman, P.E. 1975. *Plant Growth and Development*. Tata McGrawHill Publishing Co. Ltd., New Delhi.
6. Chadha, K. L. 2003. *Handbook of Horticulture*, ICAR, New Delhi. Choudhury, B. 1983. *Vegetables*. National Book Trust, New Delhi.
7. Das, P. C. 1993. *Vegetable crops in India*. Kalyani Publishers
8. Gopalakrishnan, T. R. 2007. *Vegetable Crops*. New India Publishing Agency, New Delhi.
9. Hazra, P. and Som, M. G. 1999. *Technology for vegetable Production and Improvement*. NayaProkash, Calcutta

Course No. 1.6
Course Code: SDC1AG03
Course Title: Fundamentals of Agricultural Engineering
Credits: 4
Total Contact Hrs: 60 Hrs

Objectives

- To familiarize with fundamentals of water management.
- To acquaint with various soil conservation methods.

MODULE 1

12 Hrs

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition.

MODULE 2

12 Hrs

Methods of determining water requirement-effective rainfall. Methods of irrigation and their engineering aspects - surface irrigation, sprinkler, drip - Agronomic techniques to improve water use efficiency- factors affecting water use efficiency.

MODULE 3

12 Hrs

Soil erosion- nature and extent of erosion; types- soil erosion by water- different forms- Soil conservation vs. water conservation - agronomic measures- mechanical measures- Role of grasses and pastures in soil conservations; Wind breaks and shelter belts.

MODULE 4

12 Hrs

Water harvesting techniques - in situ and ex situ water harvesting methods - Farm ponds, percolation ponds or wells, check basin, minor irrigation tanks.

MODULE 5

12 Hrs

Surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields.

Text books:

1. Dhruvanarayana, V.V. 1993.*Soil and Water Conservation Research in India*. ICAR, New Delhi.
 2. Gurmel Singh, C. Venkataraman, G., Sastry, B. and Joshi, P. 1990.*Manual of Soil and Water Conservation Practices*. Oxford and IBH Publishing Co., New Delhi.
 3. Hansen, V.Eh., Israelsen, O.W., and Stringham, G.E. 1979. *Irrigation Principles and Practices* (4th Ed.). John Wiley and Sons, New York.
 4. Lenka, D. 2001.*Irrigation and Drainage*. Kalyani Publishers, New-Delhi.
 5. Mal, B. C. 2002.*Introduction to Soil and Water Conservation Engineering*, Kalyani Publishers, New-Delhi.
 6. Michael, A.M and Ojha, T.P. 2005.*Principles of Agricultural Engineering-Vol.II*. Jain Brothers, New Delhi.
 7. Michael, A.M. 1988.*Irrigation Theory and Practice*. Vikas Publishing House Pvt. Ltd., New Delhi.
-

Course No. 1.7

Course Code: SDC1AG04

Course Title: Fundamentals of Agronomy and Horticulture – Practicals

Credits: 6

Total Contact Hrs: 90 Hrs

Objectives

- To develop skill in propagation and cultivation aspects of horticultural crops.
- To familiarize with cultivation aspects of cereals and millets, pulses and tuber crops.

Contents

1. Identification of cereals and millets, pulses, and tuber crops.
 2. Different methods of sowing; direct seeding: broadcasting, dibbling and drilling-transplantation.
 3. Seed treatment - Rhizobium inoculation of leguminous crops.
 4. Identification of manures -organic manures: bulky and concentrated manures
Fertilizers: Straight, complex and mixed fertilizers - identification and preparation.
 5. Fertilizer recommendation and calculation for major cereals and pulses.
 6. Familiarization with green manure crops and cover crops.
 7. Familiarization to Different planting systems and layout
 8. Propagation methods - sexual propagation -seed viability tests, dormancy breaking methods.
 9. Propagation structures - mist chamber, green house, hot beds etc.
 10. Propagation by cuttings.
 11. Propagation by layering - types of layering.
 12. Propagation by grafting - methods of grafting
-

References:

- Human Resource Management- Text and Cases-- VSP Rao
 - Human Resource Management – PravinDurai 2. Human Resource Management—Snell, Bohlander
 - Personal Management and Human Resources—VenkataRatnam .Srivasthava
 - A Hand Book of Personnel Management Practice—Dale Yolder
-

Course No. 2.4

Course Code: SDC2AG05

Course Title: Plantation Crops, Spices and Fruits

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives

- To acquaint with the cultivation aspects of Plantation crops, spices and fruit crops.

Module1**15 Hrs**

Plantation crops, Introduction - importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids - nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of :-coconut and Rubber.

Module2**12 Hrs**

Plantation crops, Importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids. Nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of cashew, tea and coffee.

Module 3**12 Hrs**

Spices, Definition - classification - importance to the state. Origin - distribution - area, production .varieties - climate, soil - propagation, nursery management - site selection, layout, planting - crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: Pepper, cardamom, ginger, and nutmeg.

Module 4**15Hrs**

Fruits, Importance and scope of commercial fruit production - Global scenario of fruit production and export - Present status of fruit production in the state and in the country - problems and prospects.Crop management practices - selection and preparation of planting materials, field preparation and planting, manuring, irrigation, weed management, use of bio-regulators, other cultural operations. Cultural practices for quality improvement. Maturity indices, harvesting, grading, packing, storage and ripening techniques. Industrial and export potential- of Crops- Banana, mango,and pineapple.

Module 5**6 Hrs**

Fruits, Management practices of crops gaining importance in the state recently (mangosteen, rambutan, durian).

Text books:

1. Chadha, K.L.2001. Hand Book of Horticulture,ICAR, New Delhi.
 2. Kumar.N, Abdul Khader.J.B.M.Rangaswami.P. and Irulappan., 1993. Introduction to spices
 3. Menon.K.P.V. and Pandalai.K.M. 1960. The coconut Palm - a monograph. Indian Central Coconut Committee, Ernakulam.
 4. Purselove. J.W., Brown, E.G.Green, C.L. and Robbins, S.R.G.1981.SpicesVol-I & II.
 5. Pruthi.J.S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
 6. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post HarvestTechnology, ICAR, New Delhi, India.
 7. Amar Singh, 1986. Fruit Physiology and Production.Kalyani Publishers, New Delhi.
 8. Bose, T.K, Mitra,S.K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
 9. Hayes,W.B. 1957. Fruit Growing in India.Kitabitan, Allahabad.
 10. Kumar, N. 1997 (6th Edition).Introduction to Horticulture.Rajhalakshmi Publications, Nagercoil
 11. Mitra,S.K, Bose,T.K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers , Calcutta.
 12. Naik,K.C. 1949. South Indian Fruits and Their Culture.Varadachari Co., Madras.
 13. Samson, J.A. 1980. Tropical Fruits.Longman group, London.
-

Course No. 2.5**Course Code: SDC2AG06****Course Title: Fundamentals of Seed Technology****Credits: 4****Total Contact Hrs: 60 Hrs**

Objectives

- To familiarize with the fundamentals of plant breeding.
- To familiarize with the basics of seed technology.

Module1: Morphology and systematics of crop plants**20 Hrs**

General features of important families - morphology of roots, stem, leaves, flowers, fruits and seeds.Introduction to field crops - Classification of field crops. Botany and economic importance of crops like Rice, Ragi, cowpea, Bitter Gourd, Cucumber, Brinjal, Chilli, Tomato, Soyabean,coconut,Groundnut, Gingelly, Tapioca, Cotton, Sweet potato, Rubber, Mango, Cashew, Pepper, Papaya and Banana.

Module 2: Principles of Seed Technology**20 Hrs**

Introduction to Seed Production, Importance of Seed Production,The concept of a seed-definition-structure of a seed-seed development process, Definition, Characters of good quality seed,Factors

affecting seed quality - ecological influences , packing practices, harvest and post harvest handling, Genetic and agronomic principles of seed production, Seed testing procedures for quality assessment- Physical, Purity, germination and viability test, Principles of establishing a seed testing laboratory, Post harvest seed management techniques seed extraction-seed processing- drying-cleaning-upgrading-seed blending, Dormancy of seed, role of growth regulators in restoring seed viability, physical agents for increased seed germination, seed vigour etc. Seed treatment, Importance of seed treatment, types of seed treatment, equipment used for seed treatment, Seed packing and seed storage, factors affecting seed longevity during storage and conditions required for good storage, General principles of seed storage, measures for pest and disease control, temperature control, Seed production of major crops - field crops , plantation crops , fruit plants ,spices, ornamental plants , medicinal plants, Different classes of seeds- Production of nucleus, breeder's seed, foundation and certified seed production, Seed certification, procedure for seed certification, field inspection and field counts etc.,

Module 3: Legislation of Seed Technology

20 Hrs

Seed Legislation - Seed Act and Seed Act enforcement, Central Seed Committee, Central Seed Certification Board, State Seed Certification Agency, Central and State Seed Testing Laboratories; Seed Act 2000 and other issues related to seed quality regulation, Organizations involved in seed production i.e., public, quasi, co operative, private etc. Planning seed production programme- seed farm organization-procurement and pricing policy-economics of seed production of different crops; government policy in seed production and study of export potential of seeds.

Text books:

1. Albert F-Hill and O.P. Sharma, 1996. Economic Botany. Tata McGraw - Hill Publishing Company Ltd., New Delhi
2. Chalam, G.V., J. Venkateswarlu. 1966. Agricultural Botany in India-Vol. 1. Asia publishing house, Bombay, New Delhi
3. Daniel Sundararaj, D and G. Thulasidas, 1993. Botany of field crops. Macmillan India Ltd., New Delhi
4. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons INC. USA. Toppan Co. Ltd. Japan
5. 4. Choudhari, T.C. 1982. Introduction to Plant Breeding. Oxford A& IBH Publishing Co., New Delhi
6. 5. Elliot. 1958. Plant Breeding & Cytogenetics. Mc Grow Hill. New York
7. Sharma, J.R. 1989. Principles and Practice of Plant Breeding. Tata McGraw - Hill Publishing Company Limited, New Delhi.
8. Singh, B.D. 2001. Fundamentals of Genetics. Kalyani Publishers. New Delhi. Ludhiana
9. Singh, B.D. 2003. Plant Breeding Principles and Methods. Kalyani Publishers. New Delhi/ Ludhiana.
10. Agrawal, R.L. 1995. *Seed Technology*. Oxford, IBH Publishing Co., New Delhi.
11. Bose, T. K. and Som, M. G. 1990. Vegetable crops in India. Naya Prokash, Calcutta.
12. Das, P. C. 1993. Vegetable crops in India. Kalyani Publishers
13. Dahiya, B.S and Rai, K.N., 1997. *Seed Technology*, Kalyani Publishers.

HIS5D02 HISTORICAL TOURISM

Module I Historicising Travel in India

Travelogues – Ancient – Megasthenese- Pliny – Fa –Hsien

Medieval – Marcopolo – Ibn Batuta-

Modern – Ralf Fitch –Buchanan

Module II Emergence of Destinations

Religious Destinations – Puri, Haridwar, Ajmir ,Sabarimala , Sravanabelgola, Malayattur

Cultural Destinations – Santinekethan , Wardha, Thunchan Paramba

Historical Destinations – Udayagiri, Khandagiri Caves , Mahabalipuram, Hampi, Ajanta Ellora

Fesival Destinations – Prayag, Thrissur, Kannur

Landscape Destinations – Shimla, Ooty, Alappuzha

Sanctuary Destinations – Vedantangal, Gir, Silent Valley

Module III Tourism as Industry

Components of Tourism – Locale- Accommodation- Transport- Homestay – Food – Hospitality

Varieties of Tourism

Eco Tourism

Module IV Kerala and Her Tourist Potential

Natural and Cultural heritage – Hill Stations – Sanctuaries

Thiruvananthapuram – Pathanamthitta- Calicut – Malappuram

Book list

Module I:

1. Viswanath Ghosh, Tourism and Travel Management

2. S.P Gupta, Cultural Tourism

Module II

1. Ratan Deep Singh, Infrastructure Tourism in India

2. Salini Modi, Tourism and Society

Module III

1. Ratan Deep Singh, Dynamics of Modern Tourism

2. Kunol Chattopadhyaya, Tourism Today- Structure, Marketing and Profile

Module IV

1. Ratan Deep Singh, Economic Impact of Tourism development: An Indian Experience
2. A Sreedhara Menon, Cultural Heritage of Kerala

Giddens, Anthony	- The Consequences of Modernity.
Wallerstein Immanuel	- The Modern World System
Sharma, SL	- Development: Socio-Cultural Dimensions.

SEMESTER III

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC 3 E01 ENVIRONMENTAL SOCIOLOGY

Objectives

- To familiarise the students with the basic arguments in environmental sociology
- To introduce theoretical discussions in environmental sociology
- To create an awareness on environmental issues and the need for conservation

MODULE 1 INTRODUCTION

1.1 Environmental Sociology: Nature, Scope and Importance

1.2 Environmental degradation, Environmental Preservation, Environmental Conservation, Environmental Management

1.3 Environment, technology and society, Elements of Social Ecology

MODULE 2 THEORETICAL PERSPECTIVES

2.1 Classical Theories: Marx, Durkheim and Weber on Environmental Concerns

2.2 Emerging Theories: Patrick Geddes, Dunlap and Cattons, Allan Schnaiberg, Ulrich Beck

2.3 Indian thinkers: Radhakamal Mukherjee, Ramachandra Guha

MODULE 3 ENVIRONMENTAL ISSUES

3.1 Issues related to Pollution, Deforestation, Displacement and Relocation: Climate Change, Global Warming, Environmental Migrants

3.2 Ecological Conflicts, Environmental Inequality and Environmental Justice

3.3 Environmental legislations, Environmental Laws in India

MODULE 4 ENVIRONMENTALISM

4.1 Environmentalism, Ideologies of Environmentalism

4.2 Environmental Ethics, Sustainable Development

4.3 Environmental Movements: Green Peace, Chipko movement, Narmada Bachao Andolan,
Silent Valley Movement

References

Giddens, Anthony. 1996 “Global Problems and Ecological Crisis” in Introduction to Sociology. 2nd Edition. New York: W.W. Norton and Co.

Michael Redclift, 1984 Development and the Environmental Crisis, Meheun Co. Ltd.

Munshi, Indra. 2000 “‘Environment’ in Sociological Theory” Sociological Bulletin.

Vol.49, No.2.

Schnaiberg Allan, 1980 The Environment, Oxford University Press. N.Y.

UNDP. Sustainable Development. New York: OUP

World Commission on Environment and Development, 1987. Our common future Brutland report, New Delhi, Oxford University press.

SEMESTER III

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC3 E02 SOCIOLOGY OF WORK AND INDUSTRIAL LIFE

Objectives

- To familiarise with the basic concepts of work and labour
- To identify the role of Industry in modern society
- To analyse Industrial conflicts and their impact on society

IMPROVEMENT OF COURSE

The candidates who wish to improve the grade / grade point of the external examination of a course they have passed already can do the same by appearing in the external examination of the concerned semester along with the immediate junior batch. A candidate will be permitted to improve the CGPA of the Programme within a continuous period of four semesters immediately following the completion of the programme allowing only once for a particular semester. The CGPA for the betterment appearance will be computed based on the SGPA secured in the original or betterment appearance of each semester whichever is higher.

SGPA CALCULATION

SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses taken by a student. After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below:

$$\text{SGPA (S}_j\text{)} = \Sigma(\text{C}_i \times \text{G}_i) / \text{Cr}$$

Where 'S_j' is the j semester, 'G_i' is the grade point scored by the student in the i course, 'C_i' is the credit of the i course, 'Cr' is the total credits of the semester.

CGPA CALCULATION

$$\text{CGPA} = \Sigma(\text{C}_i \times \text{S}_i) / \text{Cr}$$

Where C_i is the credit of the ith semester, S_i is the SGPA of the ith semester and Cr is the total number of credits in the programme. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme. The SGPA and CGPA shall be rounded off to 2 decimal points. For the successful completion of a semester, a student should pass all courses and score a minimum SGPA of 2.0. However, the students are permitted to move to the next semester irrespective of their SGPA.

DETAILED SYLLABUS

CT01. PHYCOLOGY, BRYOLOGY, PTERIDOLOGY AND GYMNOSPERMS (1.5+1+2+1.5 = 6 hours per week)

Phycology

1. Classification of Algae-comparative Survey of important systems - Fritsch-Smith-Round. Criteria for algal classification-Phylogenetic considerations.
2. Biological importance of Planktons.
3. Algal cytology-Basic ideas of cell features-Electron microscopic studies of algal cell, cell wall, flagella, chloroplast, pyrenoid, eyespot- their importance in classification.
4. Reproduction-Different types of life cycles in algae.
5. General account of energy sources and pigments in algae.
6. Economic importance of algae-Roll of algae in soil fertility, algae in industry-Biological importance of phytoplanktons and water blooms.
7. General account of thallus structure, cell ultra-structure, reproduction, relationships and evolutionary trends in the following groups: Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta, Rhodophyta.

References:

1. Fritsch, F.E. The structure and Reproduction of Algae.
2. Smith, G.M. Manual of Phycology
3. Round, F.E, The Biology of Algae.
4. Pold and Wyane. Introduction of Algae.

Bryology

1. General characters and systems of classifications of Bryophytes
2. General account of the anatomy, reproduction, life history and phylogeny of Sphaerocarpaceae, Marchantiales, Jungermanniales, Calobryales, Anthocerotales, Sphagnales, Andreales, Funariales and Polytrichales
3. Origin and evolution of Bryophytes- gametophytic and sporophytic.
4. A general account of fossil Bryophytes and their affinities.
5. Economic importance of Bryophytes.

References

1. Watson E.V. The structure and life of Bryophytes. Hutchinson Univ. Press, London.
2. Cavers F. The interrelationship of Bryophytes. New Phytologist.
3. Kashyap S.R., The Liverworts of Western Himalaya and the Punjab Plains, Vol.I&II. Chronica Botanica
4. Smith G.M. Cryptogamic Botany. McGraw Hill Book Co., N.Y.
5. Parihar N.S. An introduction of Embryophyta: Bryophyta. General Book House, Allahabad.
6. Verdoon, F.M. Manual of Bryology. Ashor & Co., Amsterdam.
7. Shaw, J. and Goffinet, B. Bryophyte Biology. Cambridge University Press.
8. Manju C. Nair, K.P. Rajesh and Madhusoodanan P.V. Bryophytes of Wayanad in Western Ghats. Malabar Natural History Society, Kozhikode.

Pteridology

1. General characters and life history of Pteridophytes.
2. Cytology of Pteridophytes- Chromosome number and polyploidy.
3. Structure and evolution of stele in Pteridophytes.
4. Origin and evolution of Sporangium.
5. Heterospory and seed habit.
6. Development and evolutionary trends in the Gametophytes of Pteridophytes.
7. Apogamy, Apospory and Parthenogenesis.
8. Classification of Pteridophytes: Holttum, Pichi-Sermolli.
9. Comparative morphology, ecology and phylogeny of the following:
 - a) Psilopsida : Rhyniales, Psilophytales and Psilotales
 - b) Lycopsida: Lycopodiales and Isoetales
 - c) Sphenopsida: Hyeniales, Pseudobomiales, Sphenophyllales, Calamitales and Equisetales.
 - d) Filicopsida: General account: Primofilicales, Ophioglossales, Marattiales, Osmundales, Schizaeales, Cyatheales, Gleicheniales, Marsileales and Salviniales.
10. Economic importance of Pteridophytes-Medicinal, Horticulture, Biofertilizer, weeds.
11. General account of the contribution of Indian pteridologists.

References

1. Bierhost, D.W. Morphology of Vascular Plants. Mac Millan Co., New York.
2. Dyer, A.C. The Experimental Biology of Ferns. Academic Press, London.
3. Jermy, A.C. (Ed.): The phylogeny and Classification of Ferns.
4. Kramer, K.U. and Green, P.S. The Families and Genera of Vascular Plants. Narosa, New Delhi.
5. Nampy, S. and Madhusoodanan, P.V. Fern Flora of South India-Taxonomic Revision of Polypodioid Ferns. Daya Publishing House, New Delhi.
6. Abdul Hameed C., Rajesh K.P. and Madhusoodanan P.V. Filmy Ferns of South India. Penta Book Publishers & Distributors, Calicut.
7. Azeez K., Venugopalakrishna Kurup V. and P.V. Madhusoodanan. Spleenworts (Aspleniaceae) of South India. Malabar Natural History Society, Calicut.
8. Venugopalakrishna Kurup V., Azeez K. and P.V. Madhusoodanan. Primitive Ferns of South India. 'V'Publishers, Kottayam.

Gymnosperms

1. Geological time scale and correlated predominant Gymnosperm flora.
Classification of Gymnosperms- Chamberlain's system.
2. Geological horizons. Distribution, morphology, anatomy, reproduction and interrelationship of the following orders (Study of families and types not required)
 - a. Pteridospermales; b. Glossopteridales; c. Caytoniales; d. Cycadaeoidales; e. Pentoxylales; f. Cycadales, g. Ginkgoales; h. Cordaitales; i. Coniferales; j. Taxales; k. Ephedrales; l. Welwitschiales; m. Gnetales
3. Phylogenetic relationship of Gymnosperms.
4. Economic importance of Gymnosperms

References:

1. Andrews, H.N. Studies in Paleobotany, Wiley, N.Y.
2. Banks, H.P. Evolution and plants of the past. Wadsworth.

3. Bierhost, D.W. Morphology of Vascular Plants. Macmillan.
4. Bower, F.O. Primitive Plants. Macmillan.
5. Chamberlain, C.J. Gymnosperms- Structure and Evolution. Univ. of Chicago Press.
6. Foster, A.S. & E.M. Gifford. Comparative morphology of vascular plants. Freeman.
7. Maheshwari, P & V. Vasil. Gnetum. CSIR, New Delhi.
8. Ramanujam, C.G.K. Indian Gymnosperms in time and space. Today & Tomorrow, Dehra Dun.
9. Sewart, W.N. Paleobotany and the Evolution of Plants. Cambridge Univ. Press.
10. Stockey, R.S. Some comments on the origin and evolution of conifers. Canadian J. Bot. 59: 75-82.
11. Taylor, T.N. Reproductive biology in early seed plants. Bioscience 32:23-28.
12. Walton. An Introduction to the Study of Fossil plants.

CT02: MYCOLOGY & LICHENOLOGY, MICROBIOLOGY AND PLANT PATHOLOGY (2.5+2.5+1= 6 hours per week)

Mycology

1. General characters of Fungi: cell-ultra structure, unicellular and multicellular organization, hyphal growth, cell wall composition, nutrition (saprobic, biotrophic, symbiotic, predacious) reproduction (vegetative, asexual, sexual), heterothallism, parasexuality.
2. Classification of fungi by Ainsworth & Bisby (1983), Alexopoulos et al. (1996)- Phylogeny of fungi- Characters used in classification.
3. General account of Myxomycota, Mastigomycota, Zygomycota, Ascomycota, Basidiomycota and mitosporic fungi. Different kinds of spores and their dispersal.
4. Fungi as saprophytes: details of the fungal decomposition of organic matter, coprophilous fungi, lignin degrading fungi, role of fungi in degradation of pesticides.
5. Fungi as symbionts: Mycorrhiza – ectotrophic, orchidaceous and Ericoid mycorrhiza, Vesicular Arbuscular Mycorrhiza - their distribution and significance. Endophytes.
6. Lichenology: General account and systematics of lichens, thallus structure, reproductive bodies, ecological significance and economic importance of lichens.

References:

1. Alexopoulos C.J., Mims, C.W. & Blackwell, M. Introductory Mycology. 4th edition. John Wiley & Sons Inc.
2. Ainsworth, G.C., Sparrow, K.F. & Susmann, A.S. (Eds.). The Fungi - An Advanced Treatise. Vol 1-4. Academic Press.
3. Burnett, J.H. Fundamentals of Mycology. Edward Arnolds.
4. Cariile, M. J. & Watkinson S.C. The Fungi. Academic Press.
5. Deacon, J.W. Introduction to Modern Mycology. Blackwell.
6. Dubey, H.C. An Introduction to Fungi. Vikas Publishers, New Delhi.
7. Hale Mason, E. The Biology of Lichens. 3rd Ed. Edward Arnold, London.
8. Jennigs, D.H. & Lysek, G. Fungal Biology. Bios Scientific Publishers.
9. Mehrotra, R.S. & Aneja, K.R. An Introduction to Mycology. New Age International Publishers.
10. Landecker, Elizabeth Moore. Fundamentals of Fungi. 4th Ed. Prentice Hall.
11. Nair, M.C. & Balakrishnan, S. Beneficial fungi and their utilization. Scientific Publishers, Jodhpur.
12. Nash, T.H. Lichen Biology. Cambridge University Press.
13. Webster, John . Introduction to Fungi. Cambridge University Press.

Microbiology

1. Introduction - main groups of microorganisms and their characteristics -prions, viroids, viruses, bacteria, mycoplasmas and actinomycetes.
2. Bacteria - classification based on Bergey's Manual. Archaeobacteria and Eubacteria. Morphology, ultra-structure, nutrition, genetics
3. Plasmids and their characterization.
4. Cyanobacteria- salient features, morphology, ultrastructure, classification and economic importance.
5. Viruses- General account of plant and animal viruses, bacteriophages and their classification. Isolation, purification, infection, replication and transmission of plant viruses. Detailed study of TMV and T4 Phage. 6. Microbial ecology- microbiology of rhizosphere and phylloplane. Sewage disposal, bioremediation

and water purification. Detection of microbes in air and water.

7. Agricultural microbiology - management of agricultural soils, biofertilizers, biopesticides.

8. Food Microbiology - Food spoilage and preservation methods. Microbiology of fermented food - dairy products, bread and other fermented plant products. Microorganisms as source of food- single cell protein.

9. Industrial Microbiology - Production of alcohol, vinegar, antibiotics, vitamins, steroids, vaccines, organic acids, amino acids.

References:

Adams, M R & Moss, M.O. Food Microbiology. New Age International Publishing Ltd., New Delhi.

Brock, T. D. Biology of Microorganisms. Prentice Hall.

Campbell, R. Microbiology. ELBS-Edward Arnold, London.

Carpenter, P.L. Microbiology. W.B. Saunders & Company, Philadelphia.

Dubey, R.C. & Maheswari, D.K. A text book of Microbiology. S. Chand.

Desikachary. Cyanophyta- Monograph

Goodfellow, M. et.al. The Biology of Actinomycetes. Academic press.

Kumar, H.D. & Swati Kumar. Modern Concepts of Microbiology.

Mathew, R.E.F. Plant Virology, Academic press.

Pelozar, M.J., Chan, E.C.S. & Krieg, N.R. Microbiology. Tata Mc Graw Hill.

Sharma, P.D. Microbiology & Plant Pathology. Rastogi Publishers, Meerut.

Plant Pathology

1. Principles of Plant Pathology- Causal agents of plant diseases - Biotic causes (fungi, bacteria, virus, mycoplasma, nematodes, angiospermic parasites. Abiotic causes (nutrient and mineral deficiencies, effect of pollution). Koch's postulates. Latrogenic diseases. Seed pathology.

2. Details of different symptoms of plant diseases.

3. Process of infection- mechanical, physiological and enzymatic action. Penetration and entry of pathogens in to host tissue.

4. Host- parasite interaction. Enzymes and toxins in pathogenesis. Defense mechanisms in plants (structural and biochemical).

5. Details of different ways of spread and transmission of plant diseases- wind and water-mediated, seed borne and vector borne.

6. Plant disease management- exclusion, eradication and protection. Different pesticides and fungicides and their application. Biocides in plant protection.

7. Study of the following diseases with reference to the symptoms, causal organisms, disease cycle and control measures:

Bunchy top of banana, Bacterial blight of paddy, Bud rot of coconut, Mahali of Arecanut, Powdery mildew of rubber, Abnormal leaf fall of rubber, tikka disease of Ground nut, Late blight of potato, Blister blight of tea, wheat rust, coffee rust, grey leaf spot of coconut, Phytophthora foot rot of pepper, rhizome rot of ginger and turmeric, angiospermic parasites-Viscum, Dendrophthoe.

References

Agrios, G.N. Plant pathology. 4th Ed., Academic Press.

Bilgrami, K.H. & Dube, H C. A Text Book of Modern Plant Pathology. Vikas Publishers, New Delhi.

Chaube, H.S. & Ramji Singh . Introductory Plant Pathology. International Book Distributing Co., Lucknow.

Gareth-Jones, D. Plant Pathology: Principles and Practice. Open University Press.

Horsfall J.G. & Cowling E. B. (Ed.). Plant Disease: An Advanced Treatise. Academic Press.

Lucas, J. A.. Plant Pathology and Plant pathogens. Blackwell.

Manners, J.G. Principles of Plant Pathology. Cambridge Univ Press.

Mehrotra, R.S. Plant Pathology. Tata Mc Graw Hill.

Pandey, B. P. Plant Pathology -pathogen and plant disease. S. Chand & Co.

Pathak, V.N., Khatri, N.K. & Pathak, M. Fundamentals of Plant Pathology. Agro-bios India.

Rangaswami, G. Diseases of Crop Plants of India. Prentice Hall India.

Tarr, S.A. J. The Principles of Plant Pathology. Winchester Press.

Wheeler, H. Plant Pathogenesis. Springer Verlag.

Wood, R.K.S. Physiological Plant Pathology. Blackwell

CT03. ANGIOSPERM ANATOMY, ANGIOSPERM EMBRYOLOGY, PALYNOLOGY & LAB TECHNIQUES
(2+2+1+1= 6 hours per week)

Angiosperm Anatomy

1. Cell wall and its development. Chemistry of cell wall- cellulose, hemicellulose, polysaccharides, cell wall proteins, water. Organisation of primary wall. Cytokinesis and growth. Plasmodesmata. Secondary wall chemical constituents- lignin, suberin, callose; organisation of secondary wall.
2. Node - nodal patterns: Unilacunar, trilacunar, multilacunar and split lateral. .Phylogenetic considerations. Leaf trace and branch trace- origin, departure; effect on stele and pith. Secondary growth in leaf traces.
3. Cambium: Development of vascular cambium and cork cambium in root and stem; cell types in vascular cambium, infected vascular cambium, seasonal variations in cambial activity; role of cambium in wound healing and grafting. Conversion of fusiform initials into ray initials; cambium in arborescent monocotyledons (Liliflorae).
4. Development and differentiation: The structure of specialized cells. Vascular differentiation (procambium, residual meristem, interfascicular and intrafascicular cambium); acropetal and basipetal differentiation in leaves, stem and roots. Sieve tube differentiation. Control of phloem differentiation. Tracheary elements differentiation. Ultra structure of phloem and xylem, brief account of transfer cells. Secondary wall thickening, cytoplasmic changes and autolysis. Control of differentiation. Genetic aspects- Induction of vessel elements. Induction of secondary xylem structure in relation to function in water conduction.
5. Anomalous secondary growth: Concepts; modification of the common type of vascular cambium, unequal activity of the vascular cambium. Successive cambia. Anomalous placement of vascular cambium. Discontinuous, unidirectional and bidirectional activity of cambium. Anomalous secondary growth in storage roots (Beet root, sweet potato).
6. Seedling anatomy: Concepts: anatomy of cotyledons, hypocotyl, seedling root, mesocotyl differentiation
7. Leaf anatomy: Unifacial, bifacial and centric leaf (onion); structure of epidermis, stomatal types; foriar sclerieds; oil cells; crystal idioblasts.
8. Anatomy in relation to taxonomy.
9. Wood anatomy- general account.

References

1. Easu, K. Plant Anatomy - Wiley Eastern Limited.
2. Fahn, A. Plant Anatomy. Pergamon Press.
3. Cutter, E.G. & Edward, E. Plant Anatomy : Experiment and Interpretations Part I and II.
4. Mauseth, J.D. Plant Anatomy - The Nenjamin Cumming Publishing Co.
5. Forester, A.S. Practical Plant Anatomy. D. Van Nostrand Company Inc.
6. Roberts, L.W. Cytodifferentiation in Plants - Cambridge University Press, Cambridge.

Angiosperm Embryology

1. Introduction to angiosperm embryology - structure of dithecos and monotheocos anther.
2. Microsporogenesis: Structure and function of wall layers, role of tapetum in pollen development
3. Male gametophyte: Pollen mitosis, division of generative cells, heterospority.
4. Megasporogenesis: Megaspore triad, dyad, coenomegaspore.
5. Embryo sac- different types- ultra-structure of components- synergid and antipodal. Theories of the morphological nature of embryo sac
6. Pollination -Artificial pollination - ultra-structural and dis-ultrastructural and histo-chemical sigma. Significance of pollen - pistil interaction. Role of pollen wall proteins and stigma. In vitro pollination and fertilization.
7. Fertilization: Role of synergids - filiform apparatus, heterospermy and triple fusion.
8. Structure and development of typical dicot and monocot embryos- structure and function of suspensor.
9. Endosperm: classification and type- ruminant endosperm- mosaic endosperm- endosperm haustoria- physiology and cytology of endosperm.
10. Polyembryony - classification – practical value.
11. Apomixis - general account, genetics of apomixis.
12. Parthenocarpy -seedless fruits
13. Experimental embryology-embryo culture, anther culture, ovule culture.
14. Embryology in relation to taxonomy.

References:

1. Bouman F. Ovule initiation, ovule development and seed coat structure in angiosperms. Today and Tomorrow Publishers, New Delhi.
2. Bhojwani S.S. and Bhatnagar S.S. The embryology of Angiosperms. Vikas Publication, New Delhi.
3. Davis C.L. Systematic embryology of Angiosperms. John Wiley.
4. Eames A.J. Morphology of Angiosperms. Mc Graw Hill.
5. Johanson D. Plant Embryology. Waltham, Massachusetts.
6. John B.D. (Ed.). Embryology of Angiosperms. Springer Verlag.
7. Maheswari P. An introduction to the Embryology of Angiosperms. Mc Graw Hill.
8. Raghavan V. Experimental embryogenesis in plants. Academic Press.
9. Wardlaw C.W. Embryogenesis in Plants. Methusen, London.

Palynology

1. Introduction- contributions of Erdtman and P K K Nair.
2. Development and structure of pollen wall. Pollen morphology and its application. Pollen evolution
3. Aero-palynology- methods of aerospore survey and analysis
4. Melittopalynology- nutritional and medical value of honey- unifloral and multifloral honey.
5. Recent advances in palynological studies- forensic-pollen allergy-oil exploration-paleopalynology.
6. Palynology in relation to taxonomy- euryalynous and stenopalynous taxa.

References:

1. Sripad N. Agashe. Palynology and its Application.
2. Kahinath Bhattacharya et. al. A Text Book of Palynology.

Laboratory Techniques

1. Study of the following instruments - their uses and principles:
 - a. Microscope: microscopic measurements - camera lucida, micrometry.
 - b. Microtomes- Sledge, Rocking, Rotary.
2. Killing, fixing and staining of plant tissues:
 - a. Important reagents and chemicals used in the preparation of fixatives and their properties.
 - b. Fixatives - FAA, Carnoy's fluid, chrome acetic, Nawaschins fluid, Craff, Flemings- composition, preparation and specific uses.
 - c. Dehydrating agents, clearing agents, mounting media. Examples and brief description.
 - d. Stains - classification, composition and specific uses - safranin, crystal violet, cotton blue, fast green, Orange - G, hematoxylin, carmine.
 - e. Brief account of vital staining.
 - f. Staining techniques - Double staining.
 - i. Saffranin - Fast green
 - ii. Crystal violet – Orange G
 - iii. Methods of embedding plant materials in paraffin wax - TBA method; embedding for Electron microscopy.
 - iv. Sectioning of embedded paraffin wax materials using Rotary Microtome.
 - v. Double staining of microtome serial sections embedding in paraffin wax - Saffranin - fast green; Crystal violet - Orange G / Erythrosin.
 - vi. Whole mounts - general account
 - vii. Maceration, smears
 - viii. Histochemical tests –
 - (1) PAS Test - insoluble polysaccharides.
 - (2) Sudan black -lipids
 - (3) Fuelgen reaction - Nucleic Acids.

References:

1. Peter Gray. Hand book of Basic microtechnique. Mcgraw – Hill.
2. John E. Sass. Botanical Microtechnique, Oxford & IBH Publishing Co.
3. John R. Baker. Principles of Biological Microtechnique –
4. A guide book to microscopical methods. A. V. Grimstone and R.J. Saker, Cambridge Univ. press.
5. K.V. Krishnamurthy. Methods in Plant Histochemistry.

Wong, C.H. Radiation Tracer Methodology in Biophysical Sciences. Prentice Hall.

Plummer, D. An introduction to Practical Biochemistry. Tata Mc Graw Hill, New Delhi.

CT07. CYTOGENETICS, GENETICS, BIOSTATISTICS, PLANT BREEDING AND EVOLUTION
(1+1.5+1.5+1+1= 6 hours)

Cytogenetics

1. Cytogenetics of aneuploids, euploids and structural heterozygotes: Effect of aneuploidy on phenotype. Transmission of monosomics and trisomics and their uses. Breeding behaviour and genetics of structural heterozygotes; translocation heterozygotes; Robertsonian translocation; B-A translocation. Karyotype- concepts and its importance. Structural chromosome aberrations- types and significance in evolution. Heteroploidy, aneuploidy, monosomy, trisomy (primary, secondary, tertiary and compensating). Nullisomy. Uses of aneuploidy in cytogenetics. Euploidy- autopolyploidy, allopolyploidy and segmental allopolyploid diploidization. Role of aneuploidy and euploidy in evolution.
2. Molecular cytogenetics: Multigenic families and their evolution; in situ hybridization- concept. Computer assisted chromosome analysis, chromosome micro-dissection and micro-cloning; flow cytometry.
3. Polytene and lampbrush chromosomes- cytogenetic importance.
4. Supernumerary chromosomes: B-chromosomes.

References

1. Alberts B., D. Bray, J. Lewis, K. Roberts and J.D. Watson. Molecular Biology of the Cell Garland Publishing Inc. New York.
2. Atherly A.G., J.R. Girton and J.F. McDonald. The Science of Genetics. Saunders College Publishing, Fort Worth, USA.
3. Burnharm C.R. Discussions in Cytogenetics. Burgess Publishing Co., Minnesota.
4. De Robertis E.D.P. and De Robertis E.M.F. Cell and Molecular Biology ISBN, Hong Kong.
5. Dupraw E.J. DNA and Chromosomes. Holt, Rinehart and Winston Inc. New York.
6. Hart D.L and E.W. Jones. Genetics: Principles and Analysis. Jones & Bartlett publishers, Massachusetts, USA.
7. Khush, G.S. Cytogenetics of Aneuploids. Academic Press.
8. Karp G. Cell and Molecular Biology: Concepts and Experiments. John Wiley & Sons, Inc. USA.
9. Lewin B. Gene. Oxford University Press, New York, USA.
10. Lewis R. Human Genetics: Concepts and Applications. WCB Mc Graw Hill, USA.
11. Malacinski G.M and D. Freifelder. Essentials of Molecular Biology. Jones and Bartlett Publishers Inc., London
12. Rieger R., A. Michaelis and M.M. Green Glossary of Genetics and Cytogenetics -Classical and Molecular. Springer-Verlag, New York.
13. Swanson C.P., T. Merz, and J.W. Young. Cytogenetics. Prentice Hall.

Genetics

1. Relevance of Mendelism in modern genetics. A critical evaluation of Mendelism on the basis of modern concept of genes.
2. Linkage and gene mapping. Three- point test cross; linkage map; interference; tetrad analysis and centromere mapping. Linkage in humans. Pedigree analysis. Genetic recombination and mapping of genes in bacteria and bacteriophages.
3. Mobile genetic elements: Transposable elements in bacteria. IS elements. Tn elements. Cmp site transposon. Cepia and P elements in Drosophila. Ac, DS and Mu elements in maize. Retrotransposons- Molecular characteristics and significance in development and evolution.
4. Extranuclear inheritance: Analysis of mitochondrial and chloroplast genomes and their utility. Cytoplasmic male sterility.
5. Quantitative genetics: Polygenic inheritance, heritability and its measurements. QTL mapping.
6. Population genetics: Systems of mating. The Hardy-Weinberg principle. Estimation of gene frequencies. Factors affecting equilibrium: natural selection, mutation, migration and genetic drift.
7. Human genetics: Human pedigree analysis, Lod score for linkage testing. Karyotype; genetic disorders.

References:

- Snustad, Simmons and Jenkins. Principles of Genetics. John Willey and Sons.
Weaver and Hendrick. Genetics. Wm. C Brown Publishers.
Goodenough. Genetics. Saunders College Publishing.

Stansfield. Theory and Problems of Genetics. Mc Grow Hills.
Strickberger. Genetics. Macmillan.
Burnet L. Essential Genetics. Cambridge University Press.
Friefelder. Microbial Genetics. Narosa Publishing House.
Gardner, Simmons and Snustad. Principles of Genetics. John Wiley and Sons, New York, USA.
Singh B.D. Fundamental of Genetics. Kalyani Publishers, New Delhi.

Biostatistics

1. The science of statistics and its applications in biological research.
2. Types and collection of data- Census and sampling- theory and methods.
3. Tabulation and presentation of data- diagrammatic and graphic presentation.
4. Analysis of data- central tendencies.
5. Measures of dispersion - Range, quartile deviation, mean deviation, standard deviation and standard error. Relative measures of dispersion - coefficient of variation.
6. Tests of significance- formulation and testing of hypothesis- testing the probability of committing type 1 and type 2 errors. z test, t test, chi-square test.
7. Analysis of variance- one way classification and two way classification, F test, F value calculation, F table.
8. Correlation and Regression analysis- coefficient of correlation- significance testing. Rank correlation. Lines of regression- coefficient of regression.
9. Experimental designs- designing an experiment- CRD, RBD, LSD. Factorial experiments.
10. Probability- application of the principles of probability- theorems of probability- applications- Probability distributions- binomial, multinomial, normal and poisson distributions.
11. Statistical softwares- SPSS, SPAR, MINITAB.

References:

1. Chandal S.R.S. A Handbook of Agricultural Statistics. Achal Prakashan Mandir, Kanpur, India.
2. Das M.N. and N.C. Giri. Designs and Analysis of Experiments. Wiley Eastern Ltd.
3. Elhance and Elhance. Fundamentals of Mathematical Statistics. Kithab Mahal, New Delhi, India.
4. Gupta S.K and V.K. Kapoor. Fundamentals of Mathematical Statistics. Sultan Chand & Sons, New Delhi.
5. Gupta C.B. An Introduction to Statistical Methods. Vikas Publishing House Pvt. Ltd.
6. Kempthorne, O. An introduction to Genetic statistics. John Wiley and Sons Inc. New York.
7. Mather K. and J.L. Links. Biometrical Genetics. Chapman and Hall, London.
8. Panse, V.G and P. Sukatme. Statistical Methods for Agricultural Workers. ICAR, New Delhi.
9. Rao C.A. Advanced Statistical Methods in Biometrical Research. Wiley and Sons, New York.
10. Singh P. and S.S. Narayanan. Biometrical Techniques in Plant Breeding. Kalyani Publishers, New Delhi.
11. Singh R.K. and Chaudhary B.D. Biometrical Methods in Quantitative Genetic Analysis. Kalyani Publishers, New Delhi.
12. Daniel W.W. Biostatistics- A foundation for Analysis in Health Sciences.

Plant Breeding

1. Introduction and objectives.
2. Organizations involved in plant breeding.
3. Breeding systems in sexually propagated plants- Floral Biology and its significance in plant breeding. Sterility and incompatibility systems.
4. Genetic resources- centers of crop genetic diversity. In situ and ex situ conservation; cryopreservation of germplasm.
5. Conventional methods of plant breeding:
Domestication of wild plants- changes under domestication.
Plant introduction- history, types, principles, plant introduction agencies in India- rules and regulations. Major achievements.
Selection- selection methods in sexually and vegetatively propagated species. Selection in segregating populations. Major achievements.
Hybridization- history, objectives, techniques, consequences and major achievements.
Heterosis breeding- genetic basis of heterosis and inbreeding depression.
6. Modern methods of plant breeding:
Mutation breeding- history, methodology, applications, merits, demerits and achievements.

Polyploidy breeding- methodology, applications, merits, demerits and achievements.

Biotechnological approaches in plant breeding- Molecular markers and their uses- Transgenic plants- critical evaluation.

7. Breeding for special purposes: Resistance breeding- a brief account of disease resistance, pest resistance, stress resistance- achievements. Quality breeding- objectives and achievements.

8. Biometrical techniques in Plant Breeding- analysis of variability, heritability, genetic advance and combining ability.

9. IPR- Protection of plant variety and farmers' right act.

References

1. Allard R.W. Principles of Plant Breeding. John Wiley and Sons, New Delhi.
2. Chahal G.S. and Gosal S.S. Principles and Procedure of Plant Breeding. Narosa Publishing House, New Delhi.
3. Jain H.K. and Kharkwal M.C. Plant Breeding- Mendelian to Molecular Approaches. Narosa Publishing House, New Delhi.
4. Roy D. Plant Breeding- Analysis and Exploitation of Variation. Narosa Publishing House.
5. Hayward M.D., Bosemark N.O. and Romagosa I. Plant Breeding- Principles and Prospects. Chapman & Hall.
6. Gupta S.K. Plant Breeding- Theory and Techniques. Agrobios (India), Jodhpur.
7. Khan M.A. Plant Breeding. Biotech Books, New Delhi.
8. Stoskopf N.C. Plant Breeding- Theory and Practice. Scientific Publishers (India), Jodhpur.
9. Sharma J.R. Principles and Practices of Plant Breeding. Tata Mc Graw Hill.
10. Chopra V.L. Breeding Field Crops. Oxford & IBH.
11. Mohanan K.V. Essentials of Plant Breeding. PHI Ltd., New Delhi.
12. Mohanan K.V. Essentials of Plantation Science. Penta Book Publishers, Calicut, Kerala.

Evolution

1. The concept of evolution- evidences of evolution- geological time scale and evolution.
2. Origin of life- theories and experimental evidences.- chemical evolution and biological evolution.
3. Evidences of evolution.
4. Theories of evolution.- Pre-Darwinian, Darwinian and Post Darwinian theories.- Modern synthetic theory of evolution.
5. Reproductive isolation and the origin of species.
6. Evolution at the molecular level.

CT08. PLANT ECOLOGY, CONSERVATION BIOLOGY, PHYTOGEOGRAPHY AND FOREST BOTANY
(2.5+1.5+1+1= 6 hours)

Plant Ecology & Conservation Biology

1. Habitat Ecology: Salient features of terrestrial (Biomes), fresh water (Limnology), wet land and marine habitats.
2. Productivity and Energy flow: Concepts, limits and process of primary production; methods of productivity measurements: global trends in primary productivity, energy flow models.
3. Population characteristics: density, natality, mortality, distribution, biotic potential, carrying capacity, aggregation and dispersal, ecotone and edge effect.
4. The environment and its pollution- types (land, air and water). Effect on living organisms. Control with emphasis on biological methods. Environmental hazards.
5. Threats to the global environment- green house effect, ozone depletion, El-Nino and La Nina effects.
6. Environment impact assessment (EIA) and assessment of environmental hazards- remote sensing.
7. Problems of conservation; causes of threat to environment- human interference, deforestation, habitat destruction, overexploitation of resources.
8. Identification of threatened plants; red list categories- extinct, endangered, vulnerable, rare and out of danger. Extinction process. Hot spots, keystone species and flagship species.
9. Strategies for conservation: in situ and ex situ conservation, biosphere reserve, national parks, wildlife sanctuaries. Gene banks, cryopreservation, seed banks.
10. Afforestation- social forestry, agroforestry. International biological programme (IBP), Man and biosphere programme (MAB), IUCN, world environment day, wild life preservation act (1972), Indian forest (conservation) act (1980) and United Nations Environment Programme. Environment Protection Acts.
11. Environmental awareness- role of government and NGOs.-Gaia hypothesis

12. Biodiversity- significance at Local, National and Global levels. Deep ecology (Paradigm shift from anthropocentric ecology to ecocentric ecology. National heritages.

References:

1. Negi, S.S. Hand book of National Parks and Sanctuaries in India.
2. M.P. Nair and P.K Sastry - Red data book of Indian plants.
3. Mehrotra and B.K Suri - Remote sensing for environment and forest management.
4. Negi S.S - Biosphere reserves in India.
5. Lucas and Syngé - IUCN Red data book. IUCN, Stockholm
6. Dasman R.F - Environmental Conservation.
7. Odum E.P. Fundamentals of ecology
8. Odum E.P. Basic principles of ecology
9. Misra K.R. Ecology workbook.
10. Puri G.S. - Indian Forest Ecology Volumes I and II. Oxford & IBH.
11. Clarke G.L - Elements of Ecology.
12. Chhatwal G.L. Encyclopedia of environmental biology.
13. Ray P.K. - Pollution and Health. Willey-Eastern Ltd, New Delhi.
14. Michael P.- Ecological methods for field and laboratory investigations. Tata McGraw Hill, New Delhi.
15. Kershaw K.A. Quantitative and Dynamic Plant Ecology. ELBS.

Phytogeography

1. Patterns of plant distribution: continuous distribution: circumpolar, circumboreal, circum austral, pan tropical.
2. Discontinuous distribution: Theory of land bridges, theory of continental drift, theory of glaciation.
3. Endemic distribution (neoendemic, paleoendemic), age and area hypothesis.
4. Phytochoria of world and India.

References:

1. Ronald Good. The geography of flowering plants. Lcngmans.
2. Bharucha F.R. A text book of plant geography of India. Oxford University Press.
3. Puri G.S. Indian Forest Ecology, Vol I, II. Oxford, New-Delhi.

Forest Botany

1. Forest- Definitions. Study of various types of forests in the world and in India.
2. Forest products-Major and minor with special reference to Kerala.
3. Influence of forests on environment. Consequence of deforestation and industrialization- sustainable utilization of bioresources.

References

1. Agarwal A.P. Forests in India. Oxford & IBH.
2. Gregorv G.R. Forest products, production, trade and consumption, quantity and value of raw materials requirements. Ford foundation, New-Delhi.
3. Puri G.S. Indian Forest Ecology Vol. I& II. Oxford & IBH.
4. Champion G.H. and Seth S.K. A revised survey of the forest types of India.

CP09. PRACTICALS OF CELL BIOLOGY, MOLECULAR BIOLOGY, BIOPHYSICS, CYTOGENETICS, (0.5 + 1+ 0.5+1= 3 hours)

Cell Biology

1. Study of Mitosis in root tip cells.
2. Pre-treatment of root tips with colchicine /hydroxy quinoline /paradichlorobenzene and study of chromosomes in Chlorophytum, / Zea mays/ Crotalaria/ Cyanotis.
3. Isolation of plastids and mitochondria.
4. Chromosome banding

Molecular Biology

1. Working out problems from molecular genetics.
2. Isolation of nucleic acid and identification of histones by SDS-PAGE.

3. Project work may be done by a group of students (5 to 7 members) and a Teacher in the department is to supervise the work throughout the 5th and 6th semester.
 4. Basic methods of social research discussed in the Semester 4 (SO4 B05: Social Research Methods) and in Semester 5 (SO5 B10: Research Methods and Social Statistics) should be applied for project work.
 5. Project work should be based on either primary or secondary sources of data.
 6. The project work report may contain the following items
 - a) Introduction
 - b) Methodology
 - c) Analysis
 - d) Conclusions
 - e) Bibliography
 - f) Appendix, if any
- A declaration of students and certificate of the supervising teacher should be included in the report.
7. Project Work Report may be in typed form in 30 to 40 pages (English: Times New Roman, 12 point font, Malayalam: 12 point font; 1.5 space). Report should be spiral bound and three copies of the same are to be submitted.
 8. Report presentation is to be made in an open meeting by the whole group. No Member shall be exempted from the presentation. Participation of each member will be considered in the process of evaluation. All the members will be awarded with the same grade for the presentation. Viva-voce will be conducted individually and individual grades will be awarded. The grade of the student for project work will be the average of the common grade for presentation (75%) and individual grade for Viva-voce (25%).

CORE COURSE

SOC6 B.11 ENVIRONMENT AND SOCIETY

No. of Credits: 4

Objectives

1. To provide basic knowledge of environmental sociology
2. To make the students aware of the various environmental issues

MODULE I ENVIRONMENTAL SOCIOLOGY

- I.1. Emergence and development of environmental Sociology
- I.2. Scope, Importance Need for Public awareness, Multidisciplinary nature of environmental studies .

MODULE II THEORETICAL FOUNDATIONS

- II.1. Views of Emile Durkheim, Max Weber, Karl Marx, Parsons , Anthony Giddens.

MODULE III ENVIRONMENTAL ISSUES

- III. 1. Issues pertaining to water, air, soil, solid waste, sanitation, Technological waste, Importing and Exporting of waste
- III. 2. The role of Multi Nationals, Global warming, Climate Change

MODULE IV ENVIRONMENT AND DEVELOPMENT

- IV.1. Deforestation, Construction of dams , Extinction of species
- IV.2. Exploitation of natural resources and Bio diversity conservation

References

- Benny Joseph- Environmental studies
- Shardha Singh & Manisha Shukla- Environmental studies
- Sukant K Chaudhary- Culture, Environment and Sustainable Development
- Robe White-Controversies in Environmental Sociology
- Redcliff and Benton- Social Theory and Global Environment
- Ramachandra Guha-Social Ecology

UNIVERSITY OF CALICUT
M.Sc. CHEMISTRY (CSS PATTERN) - SEMESTER IV

CH4EO6 - NATURAL PRODUCTS & POLYMER CHEMISTRY (4 Credits, 72 hrs)

UNIT 1: Basic aspects of Natural Products (9 hrs)

Classification of Natural Products: Classification of Natural products based on chemical structure, physiological activity, taxonomy and Biogenesis. Carbohydrates, Terpenoids, Carotenoids, alkaloids, steroids, anthocyanins etc. Methods of isolation of each class of compound

Essential Oils: Isolation and study of important constituents of lemon grass oil, citronella oil, cinnamon oil, palmarosa oil, turpentine oil, clove oil, sandalwood oil, Essential oils of turmeric and ginger. Oleoresins of pepper, chilly, ginger and turmeric. Aromatherapy.

UNIT 2: Terpenoids and Steroids (9 hrs)

Terpenoids: classification, structure elucidation and synthesis of abietic acid.

Steroids : Classification, structure of cholesterol, conversion of cholesterol to progesterone, androsterone and testosterone. Classification, structure and synthesis of prostaglandins, biosynthesis of fatty acids, prostaglandins, terpenoids and steroids.

Steroids: Classification and structure elucidation of Cholesterol, Ergosterol, Oosterone, Androsterone, Testosterone, Progesterone, Cortisone and Corticosterone.

UNIT 3: Alkaloids and Anthocyanins (9 hrs)

Alkaloids – classification of alkaloids, structure elucidation based on degradative reactions (quinine and atropine). Biosynthesis of quinine and papaverine.

Anthocyanins: Introduction, General Nature and Structure of Anthocyanidins. Flavone, Flavonol, Isoflavone and Chalcone

UNIT 4: Dyes, Pigments and Supramolecules (9 hrs)

Brief introduction to dyes and pigments (natural and synthetic): β -carotene, indigo, cyclic tetrapyrroles (porphyrins, chlorins, chlorophyll, heme), study of phthalocyanines, squarenes, cyanine dyes

Introduction to Supramolecular chemistry and Molecular Recognition

References:

1. M. B. Smith, *Organic Synthesis*, 3/e, Academic Press, 2011.

2. F. A. Carey and R. J. Sundberg: *Advanced Organic Chemistry (part B)*, 3rd ed., Plenum Press.
3. T.W. G. Solomons: *Fundamentals of Organic Chemistry*, 5th ed., John Wiley
4. H. O. House: *Modern Synthetic Reactions*, W. A. Benjamin
5. W. Carruthers: *Some Modern Methods of Organic Synthesis*, 4/e, Cambridge University Press.
6. I. L. Finar: *Organic Chemistry* Volumes 1 (6th ed.) and 2 (5th ed.), Pearson.
7. J. Clayden, N. Green, S. Warren and P. Wothers: *Organic Chemistry*, 2/e, Oxford University Press
8. N. R. Krishnaswamy: *Chemistry of Natural Products; A Unified Approach*, Universities Press
9. R. J. Simmonds: *Chemistry of Biomolecules: An Introduction*, RSC
10. R. O. C. Norman: *Principles of Organic Synthesis*, 3rd ed., CRC Press, 1998.
11. J. M. Lehn, *Supramolecular Chemistry*

UNIT 5: Polymerization Processes (9 hrs)

Polymerization processes. Free radical addition polymerization. Kinetics and mechanism. Chain transfer. Mayo-walling equation of the steady state. Molecular weight distribution and molecular weight control. Radical Atom Transfer and Fragmentation – Addition mechanism. Free radical living polymers. Cationic and anionic polymerization. Kinetics and mechanism, Polymerization without termination. Living polymers. Step Growth polymerization. Kinetics and mechanism. Molecular weight distribution. Linear Vs cyclic polymerization, other modes of polymerization. Group Transfer, metathesis and ring opening polymerization. Copolymerization. The copolymerization equation, Q-e scheme, Gelation and Crosslinking. Copolymer composition drift Polymerization techniques. Bulk Solution, melt, suspension, emulsion and dispersion techniques

UNIT 6: Characterization and Stereochemistry of Polymers (9 hrs)

Polymer Stereochemistry. Organizational features of polymer chains. Configuration and conformation, Tacticity, Repeating units with more than one asymmetric center. Chiral polymers – main chain and side chain. Stereoregular polymers. Manipulation of polymerization processes. Zeigler-Natta and Kaminsky routes. Coordination polymerization. Metallocene and Metal oxide catalysts.

Polymer Characterization. Molecular weights. Concept of average molecular weights, Molecular weight distribution. Methods for determining molecular weights. Static and dynamic methods, Light scattering and GPC. Crystalline and amorphous states. Glassy and Rubbery States. Glass transition and crystalline melting. Spherulites and Lammellac. Degree of Crystallinity, X-ray diffraction,

UNIT 7: Polymer Solutions, Industrial polymers and Copolymers (9 hrs)

Polymer Solutions. Treatment of dilute solution data. Thermodynamics. Flory-Huggins equation. Chain dimension-chain stiffness – End-to-end distance. Conformation-random coil, Solvation and Swelling. Flory-Reiner equation. Determination of degree of crosslinking and molecular weight between crosslinks.

Industrial polymers. Synthesis, Structure and applications. Polyethylene, polypropylene, polystyrene. Homo and Copolymers. Diene rubbers. Vinyl and acrylic polymers. PVC, PVA, PAN, PA. PMMA and related polymers.

Copolymers. EVA polymers. Fluorine containing polymers. Polyacetals. Reaction polymers. Polyamides, polyesters. Epoxides, polyurethanes, polycarbonates, phenolics, PEEK, Silicone polymers.

UNIT 8: Speciality Polymers (9 hrs)

Reactions of polymers. Polymers as aids in Organic Synthesis. Polymeric Reagents, Catalysts, Substrates, Liquid Crystalline polymers. Main chain and side chain liquid crystalline polymers. Phase morphology. Conducting polymers. Polymers with high bandwidth. Polyanilines, polypyrrols, polythiophenes, poly(vinylene phenylene). Photoresponsive and photorefractive polymers. Polymers in optical lithography. Polymer photoresists. Electrical properties of Polymers, Polymers with NLO properties, second and third harmonic generation, wave guide devices.

References:

1. F.W. Billmeyer. *Textbook of Polymer Science*. 3rd Edn, Wiley. N.Y. 1991.
2. G. Odian, *Principles of Polymerisation*, 4/e, Wiley, 2004.
3. V.R. Gowriker and Others, *Polymer Science*, Wiley Eastern Ltd.
4. J.M.G Cowie. *Polymers: Physics and Chemistry of Modern Materials*. Blackie. London, 1992.
5. R.J.Young, *Principles of Polymer Science*, 3rd Edn. , Chapman and Hall. N.Y. 1991.
6. P.J. Flory. *A Text Book of Polymer Science*. Cornell University Press. Ithacka, 1953.
7. F. Ullrich, *Industrial Polymers*, Kluwer, N.Y. 1993.
8. H.G.Elias, *Macromolecules*, Vol. I & II, Academic, N.Y. 1991.

UNIVERSITY OF CALICUT
M.Sc. CHEMISTRY (CSS PATTERN) - SEMESTER IV

CH4EO7 - MATERIAL SCIENCE (ELECTIVE) (4 credits, 72hrs)

Unit 1: Introduction to Material Science (9hrs)

Introduction, classification of materials, functional classification, classification based on structure, environmental and other effects, material design and selection;

Mechanical properties – significance and terminology, the tensile test, true stress and true strain, bend test, hardness of materials.

Unit 2: Ceramic Materials (9hrs)

Definition of ceramics, traditional and new ceramics, structure of ceramics, atomic interactions and types of bonds, phase equilibria in ceramic systems, one component and multi component systems, use of phase diagrams in predicting material behaviour, electrical, magnetic, and optical properties of ceramic materials.

Unit 3: Nanomaterials and Nanotechnology (9hrs)

Nanomaterials, nanostructures, self-assembly, Nanoparticles- methods of synthesis, sol-gel process, hydrolysis of salts and alkoxides, precipitation, condensation reactions, electrokinetic potential and peptization reactions; Gelatin network- xerogels, aerogels, drying of gels; Chemical modifications of nanosurfaces, applications of sol-gel process, sol-gel coating, porous solids, catalysts, dispersions and powders

Unit 4: Materials for Special Purposes – I (9hrs)

Production of ultra pure materials - zone refining, vacuum distillation and electro refining; Ferroelectric and piezoelectric materials - general properties, classification of ferroelectric materials, theory of ferroelectricity, ferroelectric domains, applications, piezoelectric materials and applications; Metallic glasses - preparation, properties and applications.

Unit 5: Materials for Special Purposes – II (9hrs)

Magnetic materials, ferri and ferro magnetism, metallic magnets, soft, hard & superconducting magnets; Ceramic magnets, low conducting and superconducting magnets; Superconducting materials - metallic and ceramic superconducting materials, theories of superconductivity,

Vides, *Integrative Approach to Molecular Biology*, MIT Press
Vides, *Gene Regulation and Metabolism*, MIT Press
Potchard, *Medical Genetics at a Glance*, Blackwell
Jan Vijg, *Aging of the Genome*, Oxford University Press
Frank H. Stephenson, *Calculations for Molecular Biology and Biotechnology: A guide to Mathematics in the Laboratory*, Academic Press, Elsevier

References:Bioinformatics

Atwood and Parry-Smith. 2001. Introduction to Bioinformatics. Pearson Education Asia, New Delhi.
Baxevanis & Ouellette. 2001. Bioinformatics - A practical guide to the Analysis of Gdnes and Proteins, Wiley, New York.
Mount, 2001. Bioinformatics: Sequence and Genome Analysis. Cold Sprint Harbour laboratory Press, New York.
S.C. Rastogi, Mendiratta, P. Rastogi. 2005. Bioinformatics: Method & Applications. Genomics, Proteomics & Drug Discovery. Prentice Hall of India, New Delhi.
Mani & Vijayaraj. 2004. Bioinformatics: A Practical Approach. Aparna Publications, India.
Higgins and Taylor. 2000. Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, Oxford.
Jin Xiong. 2006. Essential Bioinformatics. Cambridge University Press, India Pvt. Ltd.
Rex A. Dwyer - Genomic Peril - From Bioinformatics Basics to Working Code (with CD) - Cambridge University Press.
Atwood and Parry-Smith. 2001. Introduction to Bioinformatics. Pearson Education Asia, New Delhi.
www.fgcuedu/supp

SIXTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)

ZOOLOGY Core Course XIII

Code: ZO6B 13 T

REPRODUCTIVE BIOLOGY, DEVELOPMENTAL BIOLOGY AND TERATOLOGY

(54 Hours) (3 hours per week, 3 credits)

Section A: REPRODUCTIVE BIOLOGY (14 hrs)

1. Introduction

(1 hr)

Scope, reproductive strategies in invertebrates and vertebrates: semiparity and iteroparity, sexpatterns: unisexual, reversal of sex, examples.

2. Reproductive system in human beings

(3 hrs)

Male reproductive system: Structure of testis, Semen production and composition, Ejaculation; Female reproductive system: Structure ovary and

Graafian follicle, ovulation, mention corpus haemorrhagicum, corpus luteum and corpus albicans; Accessory reproductive organs ; secondary sexual characteristics. Gametogenesis male and female

3. Pregnancy, Gestation, Placentation, parturition and lactation (2 hrs)

4. Reproductive cycles in Mammals (2 hrs)

Oestrous and menstrual cycles and their hormonal control

5. Reproductive technologies (1 hr)

Infertility and its management: Brief account of semen collection, preservation, storage, artificial insemination, surrogacy.

6. Cryopreservation and embryo transfer (1 hr)

Collection, care and preservation of embryos; *In vitro* fertilization and embryo transfer : major steps; Test tube babies

7. Assisted Reproductive Techniques (ART) (1hr)

GIFT, ZIFT, ICSI, oocyte donation and embryo donation

8. Prenatal Diagnosis (1 hr)

Different methods (invasive and non invasive). Female foeticide: ethical issues and law. (Mention Prenatal Diagnostic techniques – Prevention of misuse act – PNDT Act

9. Fertility Control (2 hr)

Natural methods, Artificial methods, chemical methods, hormonal methods, surgical contraception, removal of gonads and uterus , abortion.

Section B: DEVELOPMENTAL BIOLOGY (37hrs)

1. Introduction (1 hr)

Historical Perspective, Theories of Preformation, Epigenesis, Recapitulation and Germplasm, Determinate and Indeterminate types of development, Germ layers and Derivatives.

2. Types of eggs (2 hrs)

Classification of eggs based on: the amount of yolk (micro, meso & macrolecithal), the distribution (iso, centro & telo lecithal), presence or absence of shell (cleidoic & non cleidoic), the development (determinate & indeterminate) with examples; egg membranes (primary, secondary and tertiary)

3. Cleavage and cell lineage (3 hrs)

Types of cleavage with examples: based on planes (Meridional, Vertical, Equatorial and Latitudinal); based on amount of yolk (Holoblastic & Meroblastic); based on development (Determinate & Indeterminate); based on Pattern (Radial & Spiral); Cell lineage studies in Planocera; Different types of blastulae.

4. Early development of Amphioxus (3 hrs)
Cleavage, Blastulation, Gastrulation & Neurulation.

5. Development of Frog (8 hrs)
Fertilization, Cleavage, Blastulation & fate map, Gastrulation (Morphogenetic movements) and formation of germ layers, neurulation & notochord formation, mesoderm and coelom formation; organogeny of brain and eye; hormonal control of amphibian metamorphosis.

6. Development of Chick (7 hrs)
Fertilization, Structure of egg; cleavage, blastulation, gastrulation and formation of germ layers; Salient features of chick embryo at primitive streak stage, 24 & 33, 48 hours stage; Development and functions of extra embryonic membranes.

7. Development of Man (3 hrs)
Cleavage and formation of morula, development of blastocyst, implantation, gastrulation up to the formation of germ layers.

8. Cell Differentiation and Gene action during development (4 hrs)
Cell differentiation, totipotency, pluripotency, Dedifferentiation and Redifferentiation; controlled gene expression during development, Homeotic genes, Mention Hoxgenes; Stem cells, their significance and applications .

9. Parthenogenesis (2 hrs)
Definition, Types: i). Natural parthenogenesis: Arrhenotoky, Thelytoky, Obligatory and Facultative, ii). Artificial parthenogenesis, and significance

10. Experimental Embryology (4 hrs)
Construction of fate map, Vital staining, Marking with carbon particles & radio active tracing; Spemann's constriction experiments on amphibian embryos (Potency of nuclei and grey crescent), Importance of Grey crescent; Organizers in amphibian development (primary, secondary & tertiary organizers); Gradient experiments in sea urchin eggs).

Section C: TERATOLOGY (3 hrs)

Environmental disruption of animal development (alcohol, drugs, Nicotine and chemicals- brief account) [Refer Developmental Biology, Scott F.Gilbert].

Topics for Seminar / Assignment/Discussion

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Placenta: different types and functions
2. Development of foetal membranes in man.
3. Regeneration in animals.
4. Factors affecting regeneration
5. Factors inducing parthenogenesis.
6. Structure of different types of eggs (amphioxus, frog, insect)
7. Corpus luteum, corpus albicans and corpus haemorrhagicum

References

- Agarwal, P., *Chordate Embryology and Histology*, 1e, 2001, Krishna Prakashan
- Balinsky, B.I. *Embryology*, Saunders & Topan
- Bejley, D.J. *et al.*, *Human Reproduction & Developmental Biology*, 1980, McMillan
- Berril, N.J. & Karp, G. *Development* TMH.
- Gilbert, S.C., *Developmental Biology*, 5e, Sinauer Associates.
- Jayaprakash, M. *A Manual of Developmental Biology*, 2e, Academia, Trivandrum.
- Patten, B.M.: *Early Embryology of the Chick*, 1973, TMH.
- Patten, B.M.: *Foundations of Embryology*, 1958, McGraw Hill.
- Rugh, R.: *Frog Reproduction and Development*.
- Sastry & Shukul: *Developmental Biology*, 2003, 1e, Rastogi Pub.
- Scott, F., Gilbert: *Developmental Biology* – Sinaur Associates.
- Verma, P.S. & Agarwal V.K.: *Chordate Embryology*.
- Vijayakumaran Nair, K. & George P.V. *A Manual of Developmental Biology*, 3e, 2002.
- Wolpert, L.: *Principles of Development*, 1994, OUP.
- Muller, *Developmental Biology*, Springer Publishers.

SYLLABUS
OPEN COURSES
ZO5 D 01 , 02 & 03
FIFTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)
ZOOLOGY OPEN COURSE- I
Code: ZO5-D 01
REPRODUCTIVE HEALTH AND SEX EDUCATION
(36 hours) (2 hours per week) (2 credits)

1.Introduction

(1 hrs)

Reproductive rights, Need for sex education

2.Sex determination and Chromosomal anomalies

(5hrs)

Chromosomal mechanism of sex determination, Environmental control of sex determination, Hormonal control of sex determination, Barr body, Twin studies, Sex reversal, Sex chromosomal anomalies:Turner's syndrome and Klinefilter's syndrome.

3.Sexualabuses and myths

(4hrs)

Premarital and extramarital sex, Sexual abuse and rape, Sexual perversions, Alternate orientations (Homosexuality, Lesbianism, Bisexuality Paraphilias), Oral sex, Animal sex, Cyber sex, Child abuse, Prostitution, Sexual myths, Sexual hygiene.

4.Prenatal Diagnosis

(3hrs)

Different methods (invasive and non invasive). Female foeticide: Ethical issues and laws. (Mention Prenatal Diagnostic techniques – Prevention of misuse act – PNDT Act)

5.FertilityControl

(4 hrs)

Natural methods, Artificial methods, Contraceptive devices and medications, Abortion, Legal termination of pregnancy, Vasectomy, Tubectomy, Vaccines and hormones in fertility control.

6.Infertility and assisted reproductive technologic

(5hrs)

Physiological infertility, pathological infertility, causes and problems in male and female infertility. Assisted Reproductive Technologies (ART) – IVF, ET, AI, GIFT, ZIFT, ICSI, Embryo or oocyte donation, health hazards in ART, cryopreservation of blastocysts and ethics, designer baby and ethics.

7.Sexually transmitted infectious diseases

(6hrs)

Symptoms, mode of transmission, diagnosis, treatment and prophylaxis of AIDS, Syphilis, Gonorrhoea, Herpes (genital), human papilloma virus and genital warts, hepatitis, gonococcal vulvo vaginitis, Trichomonal vaginitis.

Mention the term venereal disease. Socio economic dimensions of STD.

8. Ethical aspects of sex

(2 hrs)

Introduction, Healthy relationship with opposite sex, Role of counseling, Gender discrimination in family and society, Sperm bank, Ovum bank,

9. Common diagnostic techniques

(6 hrs)

Imaging techniques and purpose of imaging – Angiography, CT scanning, MRI, PET, and Ultra sound scanning.

Techniques to monitor body vital functions – EEG, ECG, LFT.

Laboratory diagnostic methods – ELISA, WESTERN BLOT.

Therapeutic methods – Endoscopies, Laser microscopy, haemodialysis, bypass surgery, angioplasty.

. Topics for Assignments and Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Sexual counseling
2. Marriage counseling
3. Population explosion and birth control
4. Functions of male and female hormones
5. Hormones of pregnancy

References

1. Prakash Kothari : *Common sexual problems and solutions*, UBS Publishers and Distributors Ltd.
2. Kinsey, sex and fraud, Judith, Edward W. Eichel, John H. Court and J. Gordon, Editors Lochinvar : Huntington House Publications.
3. Lynn L. Long, Judith A. Burnett, R. Valorie Thomas: *Sexuality counseling An integrated approach* , Pearson, Merrill Prentice Hall.
4. Robert T. Francoeur: *Becoming a sexual person*, John Wiley and Sons.
5. Guyton & Hall: *Textbook of Medical Physiology*
6. Churchill Livingstone : *Davidson's Principles and Practice of Medicine*.
7. Vander, Sherman and Luciano : *Human Physiology*, McGraw Hill.
8. Vijayakumaran Nair, K.and Paul, P.I: *Animal Physiology and Biochemistry*,

SEMESTER II**CORE COURSE****NO. OF CREDITS: 5****SOC2 C08 GENDER STUDIES*****Objectives***

- To introduce the basic concepts of Gender Studies
- To familiarize the theoretical perspectives on Gender
- To discuss the Gender dynamics in Indian society
- To discuss Gender relations in the context of Kerala society

MODULE 1 GENDER AS A SOCIAL CONSTRUCT

Gender Studies: Genesis ,Women's studies/gender studies
 Basic Concepts - Sex/Gender, Gender identity, Gender Stereotypes, Gender Discrimination,
 Gendered division of labour , Heteronormativity, LGBTIQ
 Different waves of Feminism, Feminist Perspectives - Liberal,
 Radical, Marxist, Socialist, Eco-feminism

MODULE 2 PERSPECTIVES ON GENDER

- 2.1 Nancy Chodorow, Ann Oakley, Simone de Beauvoir
- 2.2 Judith Butler, Julia Kristeva,
- 2.3 Queer theory, Queer politics
- 2.4 Theories of masculinity: Sherry.B.Ottner, R.W. Connel

MODULE 3 GENDER DYNAMICS IN INDIA

- 3.1 Social institutions and Gender reproduction- Caste, Class, Religion
- 3.2 Gender and economy:, property relations, gender wage-gap, unpaid labour and glass ceilings
- 3.3 Representations of Gender: Objectification and stereotyping , Gendered Violence
- 3.4 Issues of sexual minorities in India

MODULE 4 GENDER AND KERALA SOCIETY

- 4.1 The making of the ideal Malayalee Woman- J.Devika kulasthreyum Chandappennum
- 4.2 Politics, women, and well-being: How Kerala became a model- Robin Jeffrey
- 4.3 Scripting Lives: Narratives of 'Dominant Women' in Kerala- Sharmila Sreekumar
- 4.4 Hierarchies of masculine performance FRIENDSHIP AND FLIRTING: MICRO-POLITICS IN KERALA, SOUTH INDIA CAROLINE OSELLA & FILIPPO OSELLA

Reference

- Desai, Neera & M. Krishnaraj
Dube, Leela et.al. (ed)
- Sharma, Ursula
- Shulamitz, Reinhartz & Lynn Davidman
Chanana, Karuna
- Dube, Leela
- Gandhi, N. & N.Shah
- George Ritzer
David Boucheir
Ann Oakley
Haralambos, Michael
J.Devika
Robin Jeffrey
Sharmila Sreekumar
- Caroline Osella & Filippo Osella
- Women and Society in India
 - Visibility and Power: Essays on Women in Society and Development
 - Women, Work and Property in North-West India
 - Feminist Research Methods
 - Socialization, Women and Education: Explorations in Gender Identity
 - Women and Kinship: Comparative Perspectives on Gender in South and South-East Asia
 - The Issues at Stake: Theory and Practice in the Contemporary Women's Movement in India
 - Sociological Theory
 - The Feminist Challenge
 - Sex Gender And Society
 - Sociology-Themes and Perspectives
 - Kulasthreeyum Chandappennum
 - How Kerala became a model
 - Narratives of 'Dominant Women' in Kerala
 - Friendship and Flirting: Micro-Politics in Kerala, South India

HIS6B14 GENDER STUDIES

Module I Key Concepts and Terminologies

Sex –Sexuality
Gender – Gendering – Parenting
Patriarchy – Matriarchy – Matriliney – Patriliney
Domestic Violence – Household management
Wife – Widow
Rape- Trafficking- Prostitution
Third Gender- Cross Dressers- LGBT

Module II Gender Studies As A Discipline

Gerda Lerner – The Creation of patriarchy
Simon de Bouver – The Second Sex
Problem of Invisibility and Marginalisation
Women as property of Men

Module III Gender Studies – The Indian Scenario

Altekarian Paradigm – Critique of Altekarian Paradigm – Brahmanical Patriarchy-
Uma Chakravarty
Seed and Earth- Leela Dube
Food and Caste- Leela Dube
Ecological Feminism – Women as creators of Life- Green Revolution and destabilizing
the life of Women– Contributions of Vandana Shiva
The Subaltern Cannot Speak- Gayatri Chakravorty Spivak
Rights over Land– Bina Aggarwal
Nature of Rape Trials- Pratiksha Baxi

Module IV Indian Society through Gender Perspective

Brahmanical Patriarchy – Widowhood
Three fold Oppression of Dalit Women
Bhakti and Sainthood
Caste and Gender

BOOKS FOR STUDY

Module I

1. V. Geetha, Gender
2. V. Geetha, Patriarchy
3. Uma Chakravarti, Gendering Caste through a Feminist Lens

4. Richard Ekins and Dave King, Blending Genders: Social Aspects of Cross Dressing and Sex Changing

Module II

1. Gerda Lerner, Creation of Patriarchy
2. Simon de Bouver – The Second Sex
3. Stephanie Coontz and Peta Henderson (eds.), Women's Work, Men's Property: The Origins of Gender and Class

Module III

1. A. S. Altekar, The Position of Women in Hindu Civilization: From Pre- Historic Times to the Present Day
2. Uma Chakravarti, Gendering Caste through a Feminist Lens
3. Uma Chakravarti, Everyday Lives, Everyday Histories: Beyond the Kings and Brahmanas of 'Ancient India'
4. Vandana Shiva, Staying Alive: Women, Ecology and Development
5. Vandana Shiva, The Violence of Green Revolution
6. M. N. Srinivas (ed.), Caste: Its Twentieth Century Avatar
7. Leela Dube, Anthropological Explorations in Gender
8. C. Nelson, L. Grossberg (eds.), Marxism and the Interpretation of Culture
9. Bina Agarwal, A Field of One's Own: Gender and Land Rights in South Asia
10. Pratiksha Baxi, Public Secrets of Law: Rape Trials in India

Module IV

1. Uma Chakravarti, Gendering Caste through a Feminist Lens
2. Uma Chakravarti, Everyday Lives, Everyday Histories: Beyond the Kings and Brahmanas of 'Ancient India'
3. Sharmila Rege, Writing Caste/ Writing Gender: Reading dalit Women's Testimonies
4. Sharmila Rege, Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position, *Economic and Political Weekly*, Vol. 33, No. 44 (Oct. 31 - Nov. 6, 1998), pp. WS39-WS46
5. Gopal guru, Dalit women Talk Differently, *Economic and Political Weekly*, Vol. 30, No. 41/42 (Oct. 14-21, 1995), pp. 2548-2550
6. Vijaya Ramaswamy, Walking Naked: Women, Society and Spirituality in South India

BC4A13 ENTREPRENEURSHIP DEVELOPMENT

Lecture Hours per week : 5

Credits : 4
Internal : 20, External : 80

Objectives :

- To familiarise the students with the concept of entrepreneurship.
- To identify and develop the entrepreneurial talents of the students.
- To generate innovative business ideas in the emerging industrial scenario.

Module I

Entrepreneur and Fundamentals of Entrepreneurship: Entrepreneurial competencies – Factors affecting entrepreneurial growth – Role of entrepreneur in economic development - Challenges of women entrepreneurs.

20 Hours

Module II

Micro, Small and Medium Enterprises: Legal Framework – Licenses – Role of promotional institutions with special reference to KINFRA , KITCO , MSME & DICs – Concessions – Incentives and subsidies.

10 Hours

Module III

Project Management: Feasibility and Viability Analysis – Technical – Financial – Network – Appraisal and evaluation - Project Report preparation.

30 Hours

Module IV

Identification of Business Opportunities in the Context of Kerala: Rate of ED Clubs – Industrial Policies – Skill development for entrepreneurs – Business Incubation : Meaning - Setting up of Business Incubation Centres.

15 Hours

Reference Books :

1. S.S. Kanka , Entrepreneurial Development , Sultan Chand.

2. Prasanna Chandra , Project Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill.
3. Vasantha Desai , Dynamics of Entrepreneurial Development, Himalaya.
4. C.B. Gupta & N.P. Sreenivasan , Entrepreneurial Development , Sultan Chand.
5. Nirmal K Gupta , Small Industry –Challenges and Perspectives, Anmol Publications.
6. Vasantha Desai , Small scale Industries and Entrepreneurship, Himalaya.

BC4A14 BANKING AND INSURANCE

Lecture Hours per week: 5

Credits: 4

Internal : 20, External : 80

Objectives:

- To enable the students to acquire knowledge about basics of Banking and Insurance.
- To familiarise the students with the modern trends in banking.

Module I

Introduction to Banking : Meaning and definition - Origin and development of banking – Customer of a bank - Structure of banking in India – Banks and economic development – Functions of commercial banks (conventional and innovative functions) – Central bank – RBI – Functions –Emerging trends in banking.

15 Hours

Module II

Negotiable Instruments : Definition - Characteristics – Types – Parties to negotiable instruments – Cheques – Types of cheques – Crossing of cheques – Drafts - Cheque vs. Draft - Endorsement – Significance – Regularity of endorsement – Liability of endorser – Electronic payments.

15 Hours

Module III

E-Banking – Centralised Online Real time Electronic Banking (CORE) – Electronic Clearing Service (ECS) – Electronic Fund Transfer (EFT) – Real Time Gross Settlement (RTGS) – National Electronic Fund Transfer (NEFT) – Society for Worldwide Interbank Financial Telecommunication (SWIFT) – E-cheque – Any Time Money – ATM s – Credit card – Debit card – Smart card – Internet banking – Mobile banking – Tele-banking.

15 Hours

Module IV

Introduction to Insurance : Concept - Need of insurance - Insurance as a social security tool - Insurance and economic development - Principles of insurance - various kinds of insurance – Life and General insurance (Fire, Marine, Medical, Personal Accident ,

SEMESTER IV

C. No	Course Code	Course Name	Credit	Marks			Hours		
				Int	Ext	Tot	T	P	Tot
4.1	GEC4EG08	A04 ZEITGEST : Readings on Society and Culture	4	20	80	100	60		60
4.2	GEC4ED09	BC4A13 Entrepreneurship Development	4	20	80	100	60		60
4.3	SDC4FT15	Apparel Production and Quality Control	5	20	80	100	75		75
4.4	SDC4FT16	Environmental Textiles	4	20	80	100	60		60
4.5	SDC4FT17(P)	Surface Ornamentation	4	20	80	100		60	60
4.6	SDC4FT18(P)	Draping	3	20	80	100		75	75
		PSC Coaching	2						
4.7	SDC4FT19(Pr)	Internship/Mini project	4	0	100	100		60	60
Semester IV Total			30			700	255	195	450

GEC4EG08A04: ZEITGEST: READINGS ON SOCIETY AND CULTURE

COURSE CODE	GEC4EG08
TITLE OF THE COURSE	A04 ZEITGEST : READINGS ON SOCIETY AND CULTURE
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	4
NO. OF CREDITS	4
NO. OF CONTACT HOURS	90(5hrs/wk)

GEC4ED09 – BC4A13 Entrepreneurship Development

Course No: 4.2
 Course Code: GEC4EDP09
 Course Name: BC4A13 Entrepreneurship Development
 Credits: 4
 Hours per week: 4
 Total hours: 60

Course Objective

On completion of this course, the student should be able to

- Familiarize with the concept of entrepreneurship
- Identify and develop entrepreneurial talents
- Generate innovative business ideas in emerging industrial scenario

Course Outline

ModuleI

Entrepreneur and fundamentals of entrepreneurship: characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

15 hours

ModuleII

Micro small and medium enterprises: legal framework – licenses – role of promotional institutions with special reference to KINFRA, KITCO, MSME&DICS – concessions – incentives and subsidies.

10 hours

ModuleIII

Project management: feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

20 hours

ModuleIV

Identification of business opportunities in the context of Kerala: rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

15 hours

Reference Books

- S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
- K Ramachandran, *Entrepreneurship Development*

SDC4FT15 – Apparel Production and Quality Control

Course No: 4.3

Course Code: SDC4FT15

Course Name: Apparel Production and Quality Control

Credits: 5

Hours per week: 5

Total hours: 75

6 Video Production Handbook Gerald Millerson New Delhi, Focal Press, 1992 7 Video Production Gerald Millerson New Delhi, Focal Press, 1999

GEC4ED12 – A14 Entrepreneurship Development

Course No: 4.3

Course Code: GEC4ED12

Course Name: A14 Entrepreneurship Development

Credits: 4

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Objectives

rs: 60

On completion of this course the student should be able to

- Familiarize the students with the concept of entrepreneurship
- Identify and develop the entrepreneurial talents of students
- Generate innovative business ideas in emerging industrial scenario

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Entrepreneur and fundamentals of entrepreneurship: - entrepreneurial competencies characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

Unit 2 (12 Hours)

Micro small and medium enterprises – legal framework – licenses – role of promotional institutions with special reference to kinfra, kitco. msme&dics – concessions – incentives and subsidies.

Unit 3 (10 Hours)

Project management – feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

Unit 4 (12 Hours)

Identification of business opportunities in the context of Kerala – rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

Unit 5 (14 Hours)

Strategic importance HRM; objectives of HRM; challenges to HR professionals; role, Responsibilities and competencies of HR professionals; HR department operations; Human Resource Planning - objectives and process; human resource information system. Talent acquisition, recruitment and selection strategies, career planning and management, training and development, investment in trainingprogramme; executive development.

References

1. S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
2. K Ramachandran, *Entrepreneurship Development*

SDC4MM13 - Production and Post-Production

Course No: 4.4

Course Code: SDC4MM13

Course Name: Production and Post-Production

Credits: 4

Hours: 60

COURSE OUTLINE

Unit 1

Exporting, uploading, Embedding video, Editing Principles, Editing Taxonomy, Codecs/compression/ Transcoding, Compressor, Color Correction, Compositing in Motion, DVD design and build

Unit 2

Language of Cinema: visual composition and visual space, balance, contrast, depth of field; narrative structure, three-act structure, dramatic aspects, acting, costumes, make up; cinematic aspects, camera, lighting and sound, mise-scene, shots, scene and sequence, editing-formal and stylistic techniques, generic organization of film.

Oracle Database Architecture - Preparing the Database Environment and Creating Database - Managing the Oracle Instance - Configuring the Oracle Network Environment - Managing Database Storage Structures - Administering User Security - Managing Data and Concurrency - Managing Undo Data Module - Implementing Oracle Database Security - Database Maintenance - Performance Management - Intelligent Infrastructure Enhancements - Backup and Recovery Concepts - Performing Database Backups - Performing Database Recovery - Moving Data Module

Unit 5 (15 Hours)

Database Architecture and ASM - Configuring for Recoverability - Using the RMAN Recovery Catalog - Configuring Backup Specifications - Using RMAN to Create Backups and recover - Performing User-Managed Backup and Recovery - Using RMAN to Duplicate a Database - Performing Tablespace Point-in-Time Recovery - Monitoring and Tuning RMAN Module - Using Flashback Technology - Diagnosing the Database - Managing Memory - Managing Database Performance - Space Management - Managing Resources - Automating Tasks with the Scheduler - Administering the Scheduler.

References:

1. *.Net Framework Essentials* .3rd Edition (O'Reilly)
2. *Beginning with C#.Net*. Wroax publications

GEC5LS15 - (S04 B.06) Life Skill Education & Presentation Skill

Course No: 5.3

Course Code: GEC5LS15

Course Name:(S04B.06) Life Skill Education & Presentation Skill

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.

Establish self-management and help to maintain work life balance.

Get an insight to career planning and development

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

Unit 2 (12 Hours)

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve interpersonal communication, effective public speaking interview, group discussion etc

Unit 3 (12 Hours)

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and sources, making a career decision, preparing a resume and tips

Unit 4 (12 Hours)

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional

intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

Unit 5 (12 Hours)

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with conflict, developing positive thinking, positive and negative self-talk, better selftalk, impacts , assertiveness, behaviour , importance of assertive behaviour.

References:

1.E Wachira, *Essential Life Skills*

SDC5IT18 (E1/E2/) - Elective 1

E1. Python Programming and Mobile Web

Course No: 5.5

Course Code: SDC5IT18 (E1)

Course Name: Elective 1 -Python Programming and Mobile Web

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Expertise Python Programming
- Learn web based applications for mobile devices

Prerequisites

- Basic Knowledge of Programming
- Knowledge of HTML and JavaScript

Course Outline

SDC4AT16 (E2) RISK MANAGEMENT AND INSURANCE**Lecture Hours per week: 5****Internal: 20, External: 80****Credits: 5****Total Hours : 75****Course Objectives:**

- To enable the students to understand risk, risk management process and techniques.
- To help the students to learn about risk financing.
- To understand risk management applications.

Course Details:

Module I : Risk: Meaning of risk - Degrees of risk - Cost of risk - Various elements of cost of risk - Sources of risk - Types of risk - Pure risk and speculative risk - Acceptable and non acceptable risks – Static and dynamic risk

15 Hours

Module II : Risk management - Characteristics of risk management - Significance - Principles of risk management - Objectives - Risk and risk management process – Risk identification - Evaluation - Risk management techniques -Selecting and implementing risk management techniques - Risk Management Information System - Organisation of risk management in business - Methods of risk management - Identification, measurement and control of risk - Evaluation, frequency and severity of losses - Pooling of risk - Insurance as risk pooling arrangements - Transferring of risks.

20 Hours

Module III : Commercial Risk Management Applications - Property - Liability - Commercial property insurance -Different policies and contracts - Business liability and risk management insurance - Workers' compensation and risk financing.

15 Hours

Module IV : Risk Management Applications - Loss of life - Loss of health - Retirement planning and annuities - Employee benefits - Financial and estate planning.

10 Hours

Module V : Risk Management Environment - Industry - Functions and organisation of insurers – Government regulation of insurance sector - IRDA - Privatisation of insurance business in India - Changes in Insurance Act - Insurance intermediaries - Insurance products pricing -Claim valuation – Foreign insurers in India.

15 Hours

Reference Books:

1. Rejda, George E: Principles of Risk Management and Insurance, Latest Edn, Addison Wesley Longm
2. McNamara: Principles of Risk Management and Insurance, Addison – Wesley
3. Dorfman: Introduction to Risk Management and Insurance, Prentice Hall.
4. Williams: Heins, Risk Management and Insurance, McGraw Hill Pub.
5. James S.Trieschman, Sandra G. Gustavsonh, Robert E. Hoyt: Risk management and Insurance, Thomson Asia Pvt. Ltd., Singapore.
6. G. Kotheshwar Rao , Risk Management. 7. Gulati, Risk Management.
8. Dr.P.K.Gupta, Insurance and Risk Management, Himalaya Publishing House.
9. Insurance Act - Latest.

COMMUNICATION SKILLS IN ENGLISH

Code	Contact Hrs/week	Credit	Semester
FEN1B01	6	5	1

Courses Objectives

- To develop confidence to respond in English during situation where the use of English is imperative
- To develop fluency in actual conversation in the English language.
- To develop the speech skills necessary for confident and intelligent participation in group discussion and to make formal and extempore speeches in English.
- To develop the skills related to teamwork and to take up team leader roles in society as well as in future workplace.

Learning Outcomes

- Learners improve their ability to express themselves in English in formal and informal situations.
- They identify the linguistic and pragmatic variations in English in relation to context and speakers.
- They attain an advanced level of mastery in all the macro skills of English.

Course Outline

Module I: Communication Theory

Communication- Brief History of Human Communication-Meaning- Importance and Process- Characteristics of Communication-Objectives –Types of Communication-Verbal & Non-Verbal Communication- Models of Communication and Modeling: Linear Model & Transactional Model- Communication Competence.

Module II: Day-to-day English

At a restaurant-ordering, offering, polite questions- **At a bus stop**- making requests, enquiring, giving suggestions, asking for directions-**At a hospital**-seeking help, giving instructions- **At a school/college**- encouraging, expressing probability, obligations.

(Enough oral drills in diverse realistic situations, both in pairs and groups, have to be done to ensure maximum performative skills of learners)

Module III: Oral communication skills

Presentations Skills (pair/single)- specific language/expressions for starting a presentation-introducing a point-listing ideas-comparing and contrasting-concluding a topic. **Mock TV News Reading**-pitch-intonation, rhythm-**Preparing and presenting short skits**-enacting scenes from dramas. **Preparing and delivering speeches**-welcome, inaugural, presidential and vote of thanks-extempore speeches-**Evaluating oral presentations.**

(Learners have to be sensitized and exposed to the language/expressions used in these different contexts. They also have to be given adequate practice to improve their performative abilities in English)

Module IV: English for Discussion/Debating Skills

Group Discussion-(controlled , guided and free) guidelines-polite expressions for disagreeing, agreeing, adding, interrupting, suggesting-**Mock Press Conference**-Polite expressions for seeking/expressing opinions in formal contexts- **Demonstration**-(language focused like cookery show, introducing a product, its function etc) vocabulary and structures used in this.

Core Texts

Taylor, Grant. Situational Conversational Practise. New Delhi: Tata Macgraw Hill, 1975.

Sunitha K.S, Annie Pothan & Sumitha Joy. Communication Skills for English Conversation

Practice: A Practice Guide to Improve Conversation Skills. New Delhi: Sterling Publishers 2006.

Suggested reading

Kennedy, Chris and Rod Bolitho. English for Specific Purpose. London : Macmillan, 1984
Gaber, Don. How to Start a Conversation and Make Friends. New Delhi: Sudha Publication. 1994.
Thomson, Neil. Communication and Language: A Handbook of Theory and Practice. Palgrave Macmillan, 2003
Practice Workbook - Premanand M E & Prasanth V G et al. *Nuts and Bolts of English*. Dept. of English, 2017. ISBN 978-81-920171-3-6

ADVANCED ENGLISH GRAMMAR

Code	Contact Hrs/week	Credit	Semester
FEN2B02	6	4	2

Course Objectives

- To enable the students to use English correctly and confidently in writing and speech.
- To foster communicative competence by improving grammatical skills.
- To introduce learners to the advanced areas of English grammar and usage.

Learning Outcomes

- Learners get exposed to advanced level of grammatical patterns and usages in English.
- They improve their skills to speak and write English accurately.
- They enhance their skills to analyse the internal patterns and functions of language in different contexts.

Course Outline

Module I

Parts of Speech-Sentence Structure (NP,VP)-Verbs (regular and irregular)-Auxiliary Verbs- primary, modal and semi-modal-Pronouns -personal, reflexive, emphatic, demonstrative, indefinite.

Module II

Time and Tense-Articles-Reporting-Tag Questions-Passive/active Voice

Module III

Comparison of adjectives-Concord-Sentence types based on clauses.

Module IV

Conjunctions (coordinating and subordinating)-Prepositions-Conditional sentences and wishes-common errors.

Core reading

Betty Azar .Understanding and Using English Grammar. Longman
David Green. Contemporary English Grammar, structures and composition. Trinity

Suggested reading

UR. Penny, *Grammar Practice Activities: A Practical Guide for Teachers*.
Cambridge:CUP,2008
Hewings, Martin.*Advanced Grammar In Use* .New Delhi: CUP,2008
Leech, Geoffrey, and Jan Svartvick. *A Communicative Grammar of English*.
London: Longman 1998
E-book available at www.englishskillsone.com

Core CourseXIV ++++++ Human Rights

Module I : Human Rights : Meaning, evolution and importance.

Approaches to the study : Western, Marxian, Feminist and Third World.

Module II : UNO and Human Rights : Universal Declaration of Human Rights

Module III : Human Rights in India: Constitutional provisions. Right to Information Act.

Module IV : Instrumentalities for the protection of Human Rights : National Human Rights Commission, Judiciary and Media.

Module V : Human Rights Movements : Amnesty International, World Watch, Asia Watch, Peoples Union for Civil Liberties, Environmental Movements.

Module VI : Challenges to Human Rights : Terrorism, Religious fundamentalism,

Police atrocities against women, children and other marginalized sections.

Books and References

1. Andrew Clapham : Human Rights: A Very Short Introduction, Oxford University Press, New York, 2007.
2. Chiranjeevi Nirmal : Human Rights in India, Oxford University Press, New Delhi, 1997.
3. Darren J.O Byrne, (ed) : Human Rights : An Introduction, Pearson Education Pvt Ltd, New Delhi, 2004.
4. Janusz Symonides (ed) : New Dimensions and Challenges for Human Rights, Rawat Publications, Jaipur, 2006.
5. Johari J.C : Human Rights and New World Order, Anmol Publications, New Delhi, 1998.
6. Krishna Iyer.V.R. : Minorities, Civil Liberties and Criminal Justice, People's Publishing House, New Delhi, 1980.
7. Shashi Motilal & Bijayalaxmi : Human Rights, Gender and Environment, Allied Publishers, New Delhi, 2006
8. South Asia Human Rights Documentation Centre : Introducing Human Rights, Oxford University Press, New Delhi, 2007.
9. Ujjwal Kumar Singh (ed) : Human Rights and peace : Ideas, Laws, Institutions and Movements, Sage, New Delhi, 2009.
10. Upendra Baxi : Inhuman wrongs and Human Rights, Har Anand, New Delhi, 1994
11. Upendra Baxi : The Right to be Human, Lancer International, New Delhi, 1987.
12. Darren O'Byrne, Human Rights, Pearson, 2012.

Journal

Indian Journal of Human Rights.

Open Course II ++++++ Human Rights in India

Module I : (A) Concept of Human Rights : Meaning, evolution and importance.

(B) Approaches : Western, Marxian and Third World.

Module II : UNO and Human Rights : Universal Declaration of Human Rights: A brief analysis

Module III : (A) Indian Constitution and Human Rights: Civil and Political Rights,
Socio-economic and cultural Rights.

(B) Acts on Human Rights : Right to Information

Module IV : Agencies for protecting Human Rights : Judiciary, Public Interest Litigation (PIL), National Human Rights Commission and Media.

Module V : (A) Human Rights Movements in India : Peoples Union for Civil Liberties (PUCL), Environmental movements.

(B) Challenges to Human Rights in India. Human Rights violations among Minorities, Dalits and Adivasis, women, children and othermarginalized sections. State and Human Rights : Police atrocities.

Book and References

1. Andrew Clapham, Human Rights : A very short Introduction, Oxford University press, New York, 2007.
2. Chiranjeevi Nirmal, Human Rights in India, Oxford University Press, New Delhi, 1997.
3. Darren J.O.Byrne, (ed), Human Rights : An Introduction, Pearson Education Pvt Ltd, New Delhi, 2004.
4. Janusz Symonides (ed), New Dimensions and Challenges for Human Rights, Rawat publications, Jaipur, 2006.
5. Johari J.C Human Rights and New world Order, Anmol Publications, New Delhi, 1998.
6. Krishna Iyer. V.R Minorities, Civil Liberties and criminal Justice, People's Publishing House, New Delhi 1980.
7. Shasi Motilal & Bijaya Laxmi : Human Rights, Gender and Environment Allied Publishers, New Delhi, 2000.
8. South Asia Human Rights Documentation Centre : Introducing Human Rights, Oxford University Press, New Delhi, 2007.
9. Ujjal Kumar Singh : Human Rights and Peace : Oxford University Press, New Delhi, 2009.
10. Upendra Baxi : Inhuman wrongs and Human Rights, Har Anand, New Delhi, 1994.
11. Upendra Baxi: The Right to be Human, Lancer International, New Delhi, 1987.

Journal Indian Journal of Human Rights

Core Course XIV - POL6BO4 Introduction to Public Administration

In this course the students are provided an introduction to the discipline of Public Administration with a special focus on contemporary administrative developments. The course explores some of the systems and structures in public administration. The paper contains certain classical and contemporary administrative theories. The course also provides the students a comprehensive understanding on major elements of public administration

Module I.

Definition, nature, scope and importance of Public Administration

-Public Administration and Private Administration.

Theories of Administration. Scientific Management; Human Relations; Bureaucratic theories.

Module II.

Administrative Law - Rule of Law - Delegated legislation - Administrative Adjudication.

Module III.

Principles of Organisation; Hierarchy -Unity of command - Span of control- Delegation - Co-ordin ation – Communication.

Module IV-

Development Administration-Weberian and Rigg's model

Module V.

Personnel Administration

- a) Spoils, Merit Bureaucratic, Aristocratic and Democratic systems
- b) Bureaucracy - Meaning – Characteristics - Defects and merits - U.P.S.C and State P.S.Cs

Books and References

1. A. Avasthi and S. R. Maheswari, Public Administration, Agra, Lakshmi Narain Aggarwal, 1996.
2. D. D. Basu, Administrative Law, New Delhi, Prentice Hall, 1986.
3. C. P. Bhambri, Administration in a Changing Society: Bureaucracy and Politics in India, Delhi, Vikas, 1991.
4. S. R. Maheshwari, Administrative Theories, New Delhi, Allied, 1994.
5. S. R. Nigam, Principles of Public Administration, Allahabad Kitab Mahal, 1980.
6. Bidyut Chakrabarty, Reinventing Public Administration: The Indian Experience, Orient Longman, 2007
7. Noorjahan Bava, Development Policies and Administration in India, Delhi: Uppal Publishers, 2001.
8. J. Perry, Handbook of Public Administration, San Francisco, Jossey-Bass, 1989
9. R. K. Arora and S. Sharma (eds.), Comparative & Development Administration: Ideas & Action, Jaipur, Arihant, 1992.
10. S. S. Gadkari and M. R. Kolhetkar, Introduction in Public Administration, New Delhi, Allied Publishers, 2000.
11. Pradeep Sahni and Etakula Vayu Nadan, Administrative Theory, PHI Learning, New Delhi 2010

SEMESTER I**CORE COURSE****NO. OF CREDITS: 5****SOC1 C03 SOCIOLOGY OF INDIAN SOCIETY**Objectives

- To introduce the different approaches to the study of Indian Society
- To discuss the different issues of Indian society
- To analyse the transformations in Indian society

MODULE 1 INDIAN SOCIETY: HISTORICAL EMERGENCE

1. Historical context and emergence of Modern India- British rule and its impact (A.R.Desai, Ramachandra Guha)
2. Freedom Movement and the emergence of the Indian Nation (A.R,Desai)
- 1.3 Indian society in the post Independent era (Contemporary India-Deshpande)

MODULE 2 APPROACHES TO THE STUDY OF INDIAN SOCIETY-I

- 2.1 Development of Sociology in India, Contextualisation and Indegenisation
- 2.2 Indological approach: Louis Dumont-Homo Heirarchicus, Purity - Pollution, Ghurye- Origin and Features of Caste System
- 2.3 Structural-Functional approach: Srinivas- Social structure and Mobility, Dube- Village Society

MODULE 3 APPROACHES TO THE STUDY OF INDIAN SOCIETY-II

- 3.1 Cultural approach: Surajit Sinha-Tribes and Indian Civilisation , N.K.Bose- Civilisational View of Indian Society
- 3.2 Dialectical approach: D.P.Mukherjee- Indian Social Structure , A.R.Desai- Social Unrest and Nationalism
- 1.1 Subaltern approach: David Hardiman- Devi Movement, Ambedkar- *Annihilation of Caste*

MODULE 4 CURRENT ISSUES IN INDIAN SOCIETY

- 4.1 Contemporary Issues in India: Poverty, Inequality of Caste and Class, Issues in Agrarian Sector
- 4.2 Secularism, Communalism, Ethnicity
- 4.3 Nationalism- Views of Tagore, M.K Gandhi ,Nehru, Constitutional Views

References

- Beteille.A. - Caste, Class and Power
- Desai. A.R. - Rural Sociology in India
- Desai. A.R. - Modernisation of Under developed Societies
- Kolenda. P.M. - Caste in Contemporary India
- Mandelbaum. D.G. - Society in India
- Kapadia. K.M. - Marriage and Family in India
- Singer.M. & Cohn.B - Structure and Change in Indian Society
- Singh, Yogendra - Modernisation of Indian Tradition
- Srinivas. M.N. - Social Change in Modern India
- Srinivas. M.N. - On Living in a Revolution and Other Essays
- Kothari, Rajini - Caste in Indian Politics
- Dumont.L. - Homo-heirarchicus
- Srinivas. M.N.(Ed) - India's Villages
- Srinivas. M.N. & Bardan.P.K.(Ed) - Rural Poverty in South Asia
- Das, Veena - Structure and Cognition- Aspects of Hindu Caste and Ritual
- Frankel & Rao M.S.A - Dominance and State power in Modern India
- Karve, Irawati - Kinship Organisation in India
- Alavi, H & Harris,J (Ed) - Sociology of Developing Societies-South Asia
- D.N.Dhanagare - Themes and Perspectives in Indian Sociology
- Dipankar Gupta (Ed) - Social Stratification
- Dipankar Gupta - Interrogating Caste
- Yogesh Atal (Ed) - Understanding Indian Society
- Fuller.C.J.(Ed) - Caste Today
- Shah. A.M. - The Family in India: Critical Essays
- Uberoi, Patricia (Ed) - Family, Kinship and Marriage
- Deshpande, Satish - Contemporary India
- Veena Das - The Oxford Companion to Sociology and Social Anthropology

SEMESTER I**CORE COURSE****NO. OF CREDITS: 5****SOC1 C04 RURAL AND TRIBAL SOCIETIES IN INDIA**

Objectives

- 1 To acquaint students with basics of rural and tribal societies in our country
- 2 To analyze rural and tribal problems
- 3 To provide knowledge of rural and tribal social institutions

MODULE 1 RURAL AND PEASANT SOCIETY

Scope and importance of the study of rural society in India

Rural Society, Peasant Society, Agrarian Society: Features

Perspectives on Indian Village Community: Historical, Ecological

Nature and changing dimensions of village society, Village Studies – Marriot & Beteille

MODULE 2 CHANGING RURAL SOCIETY

- 2.1 Agrarian Social Structure, Land Ownership and Agrarian Relations
- 2.2 Emergent Class Relations, Decline of Agrarian Economy, De-peasantization
- 2.3 Land reforms and its impact on rural social structure with special reference to Kerala
- 2.4 Migration, Globalisation and rural social transformation

MODULE 3 GOVERNANCE IN RURAL SOCIETY

- 3.1 Rural governance: Village Panchayat, Caste Panchayat, Dominant Caste
- 3.2 Decentralisation of Power in Village Society, Panchayati Raj
- 3.3 Community Development Programme in India
- 3.4 People's Planning Programme: A critical appraisal

MODULE 4 TRIBAL SOCIETY IN INDIA

- 4.1 History of Indian Tribes, Demographic Features
- 4.2 Integration of the Tribals with the Non-Tribals , Tribe- Caste Continuum,
- 4.3 Tribal Problems in India

4.4 Approaches, Planning and Programmes for Tribal Development

References

- 1-Das veena (ed),2003 “Oxford India companion to sociology and social anthropology
- 2 Desai . AR (ed),1978 Rural sociology in India, Bombay,popular
- 3 Doshi. SL & PC jain 1999 Rural sociology , jaipur,Rawat
- 2 Singh K.P. (ed.) Tribal Development in India (N. Delhi : Uppal, 1988).
- 3 Singh K.S. (ed.) Tribal Situation in India (Simla : Indian Institute of Advanced Study, 1972)
- 4 Ghurye G.S. The Scheduled Tribes
- 7 Punit , AE 1978 social system in rural India Delhi,sterling
- 8 Rao MSA (ed) 1974 urban sociology,orient longman Hyderabad
- 9 Gupta, Dipankar (ed.) Social Stratification (New Delhi : Oxford, 1992) (See John Mencher, The Caste System Upside Down)
- 10 Vidyarthi L.P. The Tribal Culture of India (N. Delhi : Concept, 1985)

UNIVERSITY OF CALICUT

Master of Commerce (CBCSS)

Semester II

MCM2C10: MANAGEMENT SCIENCE

80 Hours

Marks: 80

Objectives:

1. To familiarize students with concepts of management science and tools supporting decision making
2. To enable students to apply Management science techniques in appropriate decision situations.

Contents:

Module 1:

Introduction to Management Science- Types of decisions; Steps in decision making; Quantitative analysis and decision making; Different types of models and their uses; Model building steps.

10 hours

Module 2

Linear Programming: Basic concepts; mathematical formulation and applications; Solution of LP problem using graphic and simplex method; – Application in Business.

Transportation and Assignment: Formulation; Solving transportation (NWC method – Least Cost method – Vogel's approximations method – stepping stone method – Modified Distribution method) and assignment problems (Hungarian Method).

25 hours

Module3

Inventory and Queuing Management: Concepts of *inventory management*; Inventory models – classical EOQ, planned shortage model- deciding optimum safety stock and reorder level. *Queuing models:* Elements of a queuing system; Models with Poisson arrival and Exponential services rates- single server and infinite and finite population.

17 hours

Module 4

Project Scheduling: Concepts of PERT & CPM techniques and their applications; Network analysis- scheduling activities, determining critical path, calculation of floats; Time-cost trade-off; Resource allocation and resource levelling.

18 hours

Module 5

Markov Chains and Theory of Games: Markov Chains- decision processes; Market share analysis; Account receivable analysis. Game Theory- Pure strategy games; Mixed strategy games; Value of the game; Rules of Dominance.

10 hours

Theory 30% Problems 70%

References:

1. Anderson: Introduction to Management Science – Quantitative Technique for Decision making Thomson.
2. Operations Research – Kautiswarup, P.K. Gupta, Manmohan – Sultan Chand & Sons.
3. Operations Research SD Sharma, Kadar Notes, Ramnath&G. Meerut.
4. OR Techniques for management – VK Kapoor & Sumant Kapoor – Sultan Chand & Sons.
5. Quantitative Techniques in Management, Vohra N.D., The McGraw Hill companies

HIS5B07 KERALA SOCIETY AND CULTURE: ANCIENT AND MEDIEVAL

Module-I Kerala's Physiographical Features and Early History of the Region

Geographical features-rivers-mountains-passes-lagoons-sea coast-monsoon
Early human settlements-Peleolithic, Neolithic Periods
Iron Age in Kerala-Megalithic Culture-Megalithic sites
Kerala as a part Tamilakam
Sangam Literature: Pathittupathu, Akananuru and Purananuru
Kerala's maritime contacts-Pattanams (trade centres)-internal trade mechanisms

Module-II Polity and Society in the Perumal Era

Sources

Inscriptions- Terisapalli Copper Plate
Literature-Sanakaranarayaneeyam- Tamil Bhakti Literature- Arab Chinese accounts
Monuments-Tiruvanchikulam temple- Cheraman Masjid
Brahmin Migration to Kerala
Perumals of Mahadayapuram
Features of administration
Trade guilds and land grants –Anchuvannam –Manigramam -Valanchiyar,-
Nannadeshikal- Nuttuvar- Uralar, Karalar.
Bhakti saints- Alwars and Nayanars
Proliferation of temples-Devadasi system
Sankaracharya
Disintegration of Perumal kingdom

Module-III Age of Naduvazhis

Formation of Nadus and Swarupams- Venad
Expansion of agriculture
Emergence of village communities
Sanketams
Manipravalam Literature
Sandeshakavyas- Unnineeli Snadesham
Charitam-Unniyadi Charitam
Champu- Bhasha Naishadham Champu
Lilathilakam
Chinese trade- Arab trade- Medieval Angadies.

ModuleIV Advent of Europeans

Situation of Kerala at the time of the coming of Portuguese
Zamorin- Kunjali Marakkar

The Dutch- Hortus Malabaricus- Martanda Varma
The French
The English-
Mysorean Interlude
Subsidiary Alliance
Malavalam Bhakthi Literature and Structuring of Malayalam Language
 Thunchathu Ezhuthachan- Kilippattu
 Kunchan Nambiar- Thullal
 Poonthanam- Jnanappana

Maps

1. Important Centres of Megalithic Culture
2. Distribution of the Inscriptions of Perumals
3. Important Nadus
4. Centres of Colonial Settlements

BOOKS FOR STUDY

Module I

1. A. Sreedhara Menon, A Survey of Kerala History
2. M. G. S. Narayanan, Foundations of South Indian Society and Culture
3. Elamkulam P. N. Kunjan Pillai, Studies in Kerala history
4. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
5. K. N. Ganesh, Keralatthinte Innalekal
6. M. R. Raghava Warriar, Keraleeyatha Charithramanangal
7. Cherian, P.J.,(ed.), *Perspectives on Kerala History*, Trivandrum, 1999.

Module II

1. M. G. S. Narayanan, Foundations of South Indian Society and Culture
2. M. G. S. Narayanan, Cultural Symbiosis in Kerala
3. M. G. S. Narayanan, Perumals of Kerala
4. Elamkulam P. N. Kunjan Pillai, Studies in Kerala history
5. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
6. K. N. Ganesh, Keralatthinte Innalekal
7. P.J. Cherian (ed.), *Perspectives on Kerala History*, Trivandrum, 1999.
8. Kesavan Veluthatt, Brahmin Settlements in Kerala

Module III

1. Elamkulam P. N. Kunjan Pillai, Unnuneelisandesham Charithradrushtiyiloode
2. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
3. K. N. Ganesh, Keralatthinte Innalekal
4. M. R. Raghava Warriar, Madhyakaala Keralam
5. Cherian, P.J.,(ed.), *Perspectives on Kerala History*, Trivandrum, 1999.

Module III

1. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram(Part II)*
2. K. N. Ganesh, *Keralatthinte Innalekal*
3. K. N. Ganesh, *Kunchan Nambiyar: Vakkum Samoohavum*
4. K. M. Panikkar, *History of Kerala*
5. A. Sreedhara Menon, *A Survey of Kerala History*

HIS6E04 HISTORY OF HUMAN RIGHTS

Module I: Basic Concepts and Origin of the of Human Rights

1. Basic Concepts- Human Rights – human rights culture- Crimes against humanity- Genocide– Racism – Slavery– Apartheid—Torture- Right to food, education, health, housing, work – Discrimination- Equality– Trafficking – Migrant workers – Death penalty- Displacement
2. Magna Carta – The Bill of Rights, 1689 – John Locke’s Second Treatise of Government, 1690 – The Social Contract, 1762– United States Declaration of Independence, 1776– Declaration of the Rights of Man and of the Citizen, 1789 – Thomas Paine and The Rights of Man, 1791– Vindication of the Rights of Woman, 1792.

Module II: World Wars and the Historical Development of International Human Rights

1. Fight for Right Movement, 1915 – Fourteen points of President Wilson, 1918- League of Nations – League Covenant
2. H G Wells and the Rights of Man, 1940— Charter of the United Nations, 1945-- The Universal Declaration of Human Rights, 1948 – UN Human Rights Commission – International treaties and measures for the protection of human rights- Martin Luther King’s ‘I have a Dream’

Module III: Human Rights in Practices and Major Incidents of Violation

1. Legal restrictions on freedom– Limitations on politics and expression– Amnesty International– Human Rights Watch
2. Abu Gharib prison- Privacy of the individual –Human rights violations in Sri Lanka.

Module IV: Human Rights Situation in India

1. Indian constitution- Fundamental Rights

2. Discrimination on the grounds of caste– minority rights issues– Delhi Riots- Gujarat carnage- Teesta Setalwad- Irom Sharmila- Displacement due to the process of development- Adivasis' plight.

Book list

Module I:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, Human Rights: Confronting Myths and Misunderstandings
3. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
4. Bertrand G. Ramcharan, Contemporary Human Rights Ideas, Routledge, 2008
5. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
6. Charles R Beitz, The Idea of Human Rights
7. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations

Module II:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, Human Rights: Confronting Myths and Misunderstandings
3. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
4. Bertrand G. Ramcharan, Contemporary Human Rights Ideas, Routledge, 2008
5. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
6. Charles R Beitz, The Idea of Human Rights
7. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations
8. Roger Hormand and Sarah Zaidi, Human Rights at the UN: The Political History of Universal Justice

Module III:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
3. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
4. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations

5. Thomas G. Weiss et. al.,(eds.), Wars on Terrorism and Iraq: Human Rights, Unilateralism and US Foreign Policy

Module IV:

1. A.R.Desai(ed.), Violations of Democratic Rights in India
2. Teesta Setalvad, Gujarat: Behind the Mirage
3. V. B. Mishra, Evolution of the Constitutional History of India (1773- 1947)
4. Ashis Nandy, et.al., Creating a Nationality: Ramjanmabhumi Movement and the fear of the Self
5. Asghar Ali Engineer(ed.), The Gujarat Carnage
6. Harsh Mander, Cry, My Beloved Country: Reflections on the Gujarat Carnage 2002 and its Aftermath
7. Uma Chakravarti, Nandita Haksar, The Delhi Riots: Three Days in the Life of a Nation
8. Deepti Priya Mehrotra, Burning Bright: Irom Sharmila and the Struggle for Peace in Manipur
9. Sanjukta Das Gupta, Raj Sekhar Nasu (eds.), Narratives from the Margins: Aspects of Adivasi History in India
10. Daniel Rycroft, Sangeeta Dasgupta (eds.), The Politics of Belonging in India: Becoming Adivasi

- Dominwski , R.L., (1980) , Research Methods , New Jersey , Prentice Hall Inc.
- Misra R.P., (1983), Research Methodology Hand Book , New Delhi, Concept Publishing co.
- Neuman, Social Research Methods, 6/e, Pearson
- Young , P.V.&Schmid.C.F., Scientific Social Surveys and Research , Prentice-Hall of India Pvt. Ltd.
- Goode, W.J., & Hatt ,P.K.(1981) ,Methods in Social Research , McGraw Hill,NY
- Bailey Kenneth.D ., (1978) , Methods of Social Research ,Free Press , New York
- Kothari , C.R .,(1985) , Research Methodology: Methods and Techniques , New Delhi,
Wiley Eastern Ltd.

CORE COURSE

SOC4 B.06 LIFE SKILL DEVELOPMENT

No of credits: 4

Objectives

1. To provide with the knowledge of necessary life skill for the application in everyday life
2. To enhance the quality of addressing issue relevant to the life situations
3. To enable the students to establish productive interpersonal relationships with others
4. To equip students for handling specific issues

MODULE I INTRODUCTION TO LIFE SKILL EDUCATION

- I. 1. Definition of Life skills, Components of life skills, Need for Life skill training
- I. 2. Life Skill a Life Course approach: (a) critical thinking skills / decision making skills
(b) interpersonal/ communication skills (c) coping and self management skills .

MODULE II COMMUNICATION SKILLS.

- II.1. Communication: Definition, Types, Components -Verbal and Non Verbal Communication.
- II.2. Effective interpersonal communication
- II.3. Person to group communication: Public Speaking, Interview facing and Group Discussion

MODULE III CAREER PLANNING

III.1.Choosing a Career, Career Planning, Need and importance of Career Guidance

III.2. Career Guidance Centres, Sources of career information: Job Fair, Career Magazines,
Computerised job Search

III.3. Applying for a Job: Preparation of Resume, Follow up communication

MODULE IV SELF MANAGEMENT

IV.1. Self Esteem, Self awareness, Self control

IV.2. Emotional Quotient and Social Quotient

IV.3. Coping with emotions, Stress and strain

IV. 4. Conflict resolution, Steps and stages

IV. 5. Developing Positive thinking and Assertiveness

Reference

Elizabeth Hurlock (1968), Development Psychology, Mc Grew Hill

Baron A Robert and Byrne Donn (2003), Social Psychology, Prentice Hall of India

Delors, Jacques (1997), Learning: the Treasure Within, UNESCO , Paris

UNESCO and Indian national Commission of Co operation with UNESCO (2001), Life Skill
in Non formal education A Review, UNESCO , Paris

WHO (1999), Partners in Life Skill Education: Conclusions form a UN Inter Agency
Meeting, WHO, Geneva

Pathanki, Dhum (2005), Education in Human Sexuality: a Source Book for education, FPA
India and IPPF, Mumbai

Swathi Y Bhave (ed) (2006), Bhave's Text Book of Adolescent Medicine, Jaypee Brothers
medical Publishers , New Delhi

MKC Nair , et al (ed.)(2001), Family life education and AIDS Awareness training Manual for Minus two to
plus two

Websites

www.unesco.org

www.un.org

www.unfpa.org

www.who.int/en.

CORE COURSE

SOC5 B.07 SOCIOLOGY OF INDIAN SOCIETY

No. of Credits: 4

Objectives

1. To provide a sociological perspective for understanding the dynamics of Indian Society
2. To analyse the changes occurred in the various institutions in Indian Society

MODULE 1 FEATURES OF INDIAN SOCIETY

- I.1. Features of Indian Society- Rural and Urban
- I.2. Forms of Diversity in India-Linguistic, Religious, Racial, Ethnic
- I.3. Bonds of Unity in India-Geographical, Religious, Political

MODULE II FAMILY, MARRIAGE AND KINSHIP

- II.1. Family in Indian Society- Structural and Functional Changes
- II.2. Marriage in Indian Society-Structural and Functional Changes
- II.3. Kinship- Definition, Types, Terminology

MODULE 111 RELIGION, CASTE AND CLASS IN INDIA

- III.1. Caste: Changes in Indian Caste System: Sanskritisation, Westernisation, Modernisation,
Recent trends in Indian Caste system, Backward Classes: Scheduled Caste and Dalits,
Other Backward Classes

IV.1. Symbolic Interactionism: Historical roots-pragmatism and behaviourism, Influence of
Willaim James and John Dewey

IV.2. Major Contributors: G.H.Mead- Mind Self and Society, C.H.Cooley- Looking Glass Self
Reference

Adams, Bert and R.A. Sydie. 2001. Sociological Theory. Thousand Oaks,C.A: Pine Forge Press.

Abraham, Francis.M. 1982. Modern Sociological Theory: An Introduction, Oxford university Press

Cohen,Percy.S. 1979. Modern Social Theory, Heinemann Educational Books Ltd and The
English Language Book Society

Collins, Randall. 1986 . Weberian Social Theory. Cambridge: University Press.

Coser, Lewis. 1977, Masters of Sociological Thought, (2ed.) New York: Harcourt, Brace &
Jovanovich.

Delaney, Tim. 2008, Contemporary Social Theory, Investigation and Application. New York:
Prentice Hall.

Good, Erich. 1988. Sociology, 2nd Edition. Englewood Cliffs, NJ: Prentice Hall.

Kinloch,Graham.C.1977, Sociological Theory:Its Development and Major Paradigms,
MacGraw-Hill Book Company

Kundu, Sociological Theory, Pearson

Ritzer, George. 2000d. Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2000c. Modern Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2003. Contemporary Sociological Theory and its Classical Roots. Boston:
Mc Graw Hill.

Turner, Jonathan. H. 2003. The Structure of Sociological Theory. Belmont, CA: Wadsworth.

CORE COURSE

SOC5 B.09 SOCIAL ANTHROPOLOGY

No of credits: 4

Objectives

1. To introduce the basic concepts of Anthropology
2. To familiarize with Anthropological studies in India by focusing on Tribal Communities in the country in general and in the state of Kerala in particular

MODULE I INTRODUCTION TO ANTHROPOLOGY

- I. 1. Definition, Meaning, Nature, Scope of Anthropology, Origin of Social Anthropology
- I. 2. Methods of Anthropology: Case study, Ethnography – Focused Interview, Participant and non- participant observations

MODULE II CULTURE & SOCIETY

- II. 1. Definition, Components of Culture, Characteristics of Culture, Stages of Cultural Evolution
- II.2. Theories of Culture: Functionalist thought of Anthropology: Malinovsky, Structural theory: Levi- Strauss and Radcliff Brown
Theories of cultural process: Evolution, Acculturation, Assimilation, Diffusion, Enculturation, Integration
- II. 3. Social Institutions in Primitive Society: Marriage, Family, Kinship, Kinship Usages, Class & Lineage Totem, Religion and Magic

MODULE III TRIBES IN INDIA

- III. 1. Definition and characteristics of Tribes, Population Composition and distribution of Indian tribes, Socio – economic status of Indian tribes
- III.2. Tribes in Indian Constitution, Tribal Welfare in India
- III.3. Tribal movements in India, Tribes in transition

MODULE IV TRIBES IN KERALA

- IV.1. Characteristics, Composition and distribution,

IV.2. Tribal issues in Kerala: Landlessness, Poverty

IV.3. Field visit to a Tribal Area

(The seminar presentations in the paper should be based on the field visit. Group presentations based on the different aspects of the socio cultural life of the tribals visited should be assigned grades. Each group should consist of maximum five students. No Member shall be exempted from the presentation. Participation of each member will be considered in the process of evaluation. Grades will be assigned individually on the basis of presentation and participation. These grades would be counted as the grades for seminar presentation as part of the internal assessment)

Reference

Madan and Majumdar, An Introduction to Social Anthropology

Makhan Jha, An Introduction to Anthropological thought

Herskovits M.T, Cultural Anthropology

Leela Dube, Sociology of Kinship

Balbir Singh Negi, Man, Culture and Society

Nadeem Hasnain, Tribal India

Arup Maharatra, Demographic perspectives on India's tribes

K.S. Singh, The Scheduled Tribes

Roy Busman, Tribes in Perspective

Mathur PRG, Tribal situation in Kerala

CORE COURSE

SOC5 B.10 RESEARCH METHODS AND STATISTICS

No. of credits: 4

Objectives

1. To provide basic understanding in social statistics.

Ann Oakley: Sex Gender And Society

Haralambos, Michael : Sociology-Themes and Perspectives, Oxford University Press.

CORE COURSE

SOC6 B.14 POPULATION AND SOCIETY

No. of Credits: 4

Objectives

1. To provide a basic theoretical explanation of population studies and related concepts.
2. To provide critical analysis of the population theories
3. To analyse the changes in population in society

MODULE 1 POPULATION STUDIES

- I.1. Population Studies, Definition, Nature, Subject matter and Scope of Population Studies
- I.2. Relation of Population Studies with other Social Sciences: Demography, Sociology, Economics
- I.3. Sources of Population Data: Census, Vital Statistics, Sample Survey, Dual Report System,
Population Registers and International Publications

MODULE II THEORIES OF POPULATION

- II.1. Malthusian Theory
- II.2. Optimum Population Theory
- II.3. Demographic Transition Theory

MODULE III STRUCTURE, CHARACTERISTICS AND DYNAMICS OF POPULATION

- III.1. Population Structure and Characteristics: Sex and Age Characteristics, Marital
Status, Education, Occupation and Religion
- III.2. Fertility: Biological, Cultural and Social Factors of Fertility, Measures of Fertility
- III.3. Mortality: Factors of Mortality, Measures of Mortality
- III.4. Migration: Types of Migration- Internal and International

MODULE IV POPULATION GROWTH, DEVELOPMENT, POLICIES AND PROGRAMMES

IV.1. Population Growth in India with Special focus on Kerala -Education, Health,

Socio economic development

IV.2. Population Policies: Mortality, Fertility and Migration influencing Policies,

Anti-Natalist Policies

IV.3. Family Planning and Welfare Programmes

Reference

Asha Bhende And Tara Kanitkar: Principles Of Population Studies ,Himalayan Publishing House,Bombay ,1996

Ashish Bose: Indian Population

Thompson and Lewis: Population Problems

M.L.Jhingan , B.K.Bhatt, J.N Desai: Demography

Agarwal S.N: India's Population Problems

Bose A : Patterns Of Population Change In India

Clarke J.I: Population Geography

Mandelbaum D.G: Human Fertility In India

Srivastava S.C: Studies In Demography

Mamoria C.B: India's Population Problems

ELECTIVE COURSE

SOC6 E.01 SOCIOLOGY OF DEVELOPMENT

No: of credits: 4

Objectives

1. To familiarise the student with the concept of development.
2. To provide theoretical explanation of development
3. To understand the development experience of Kerala

MODULE II THEORIES OF DEVELOPMENT

II.1. Modernisation Theory

II.2. Dependency Theory: Immanuel Wallerstein

II.3. World System Theory: Sameer Ameen

II.4. Unequal Union development

MODULE III DEVELOPMENT EXPERIENCES IN INDIA AND KERALA

III.1 Five Year Plans, Microfinance Institutions

III.2 Community Development Programmes, Panchayathi Raj System

III.3 People's Planning Programme in Kerala

III.4 A critical evaluation of people's planning programme

References

Thomas Issac & Richard W Franke – Local Development and Planning

Katar Singh - Rural Development, Principles Policies & Management, New Delhi, Sage

Dunn Edgar. S. (1971) Economic and Social Development, A process of Social Learning,
Baltimore the John Hopkins Uty. Press

Dube S.C.(1988) - Modernisation and development

Salunkhe. S.A. (2003) - The Concept of Sustainable Development (Root Construction & Critical
Evaluation, Social Change)

SYLLABUS OF OPEN COURSES OFFERED BY SOCIOLOGY

SOC5 D.01 LIFE SKILL EDUCATION

No of credits: 2

Objectives

1. To provide with the knowledge of necessary life skill for the application in everyday life
2. To enhance the quality of addressing issue relevant to the life situations
3. To enable the students to establish productive interpersonal relationships with others
4. To equip students for handling specific issues

MODULE I INTRODUCTION TO LIFE SKILL EDUCATION

- I. 1 .Definition of Life skills, Components of life skills, Need for Life skill training
- I. 2 .Life Skill a Life Course approach: (a) critical thinking skills / decision making skills
(b) interpersonal/ communication skills (c) coping and self management skills.

MODULE II COMMUNICATION SKILLS.

- II.1. Communication: Definition, Types, Components -Verbal and Non Verbal Communication.
- II.2. Effective interpersonal communication
- II.3. Person to group communication: Public Speaking, Interview facing and Group Discussion

MODULE III CAREER PLANNING

- III.1.Choosing a Career, Career Planning, Need and importance of Career Guidance
- III.2 .Career Guidance Centres, Sources of career information: Job Fair, Career Magazines,
Computerised job Search
- III.3. Applying for a Job: Preparation of Resume, Follow up communication

Reference

- Elizabeth Hurlock (1968), Development Psychology, Mc Grew Hill
- Baron A Robert and Byrne Donn (2003), Social Psychology, Prentice Hall of India
- Delors, Jacques (1997), Learning: the Treasure Within, UNESCO , Paris
- UNESCO and Indian national Commission of Co operation with UNESCO (2001), Life Skill
in Non formal education A Review, UNESCO , Paris
- WHO (1999), Partners in Life Skill Education: Conclusions form a UN Inter Agency
Meeting, WHO , Geneva
- Pathanki, Dhum (2005), Education in Human Sexuality: a Source Book for education, FPA
India and IPPF, Mumbai
- Swathi Y Bhave (ed) (2006), Bhave's Text Book of Adolescent Medicine, Jaypee Brothers
medical Publishers , New Delhi
- MKC Nair , et al (ed)(2001), Family life education and AIDS Awareness training Manual for
Minus two to plus two

Pauline.M. Kolenda- Religion, Caste and Family Structure

Shah.A.B.- Tradition and Modernity in India

COMPLEMENTARY COURSE

SOC3 C.03 SOCIAL PSYCHOLOGY

Number of Credits: 2

Objectives

1. To provide an understanding of basic concepts in social psychology
2. To provide basic understanding on social behaviour
3. To provide basic understanding on personality and its relation with social system

MODULE 1 SOCIAL BEHAVIOUR

- I.1. Definition, Nature, Subject Matter And Scope Of Social Psychology,
Methods of Studying Social Psychology, Importance of the study
- I.2 .Groups: Definition, Types- Primary and Secondary Groups,
Social Interaction, Social and Inter Personal Relations.
- I.3. Crowd, Audience and Rumor: Definition Characteristics and
Classification of Crowd and Audience
- I.4. Leadership: Definition of leader and leadership, Characteristics,
Types, Emergence of Leadership in a Group

MODULE II PERSONALITY AND SOCIAL SYSTEM

- II.1. Attitude : Meaning, Types and Formation of Attitude
- II.2. Social Learning : Meaning and Definition, Factors in The Process Of Learning
- II.3. Personality : Definition and Factors Affecting Personality,
Social Factors Influencing Personality,

Reference

David Krech & Richard S Crutchfield : Theory And Problems of Social Psychology

Kuppuswamy B : Elements Of Social Psychology

Shaw M.E & Costanso P.R : Theories Of Social Psychology

Sheriff M & Sherriff C.M : Social Psychology

Lind Gren H.C : An Introduction to Social Psychology

Cooper.B.Joseph&James.L.McGaugh : Integrating Principles of Social Psychology

Douglas T Kenrick : Social Psychology

Steven L Neuberg,Robert B Cialdini : Social Psychology Unraveling the Mystery

Sharon.S.Brehm,Saul.M.Kassin,Steven Fein : Social Psychology

COMPLEMENTARY COURSE

SOC4 C.04 POLITICAL SOCIOLOGY

No of Credits: 2

Objectives

1. To understand critically the fields of political sociology
2. To understand the role of political socialization
3. To acquire knowledge about the current political scenario of India

MODULE I INTRODUCTION TO POLITICAL SOCIOLOGY

I.1. Definition, Subject matter, Importance and problems of Political sociology. Relationship with Political Science

MODULE II POLITICAL SOCIALIZATION AND POLITICAL PROCESSES

- II. 1. Political socialization, Meaning, Types, Means and Determinants of political participation
- II.2. Politicization of caste, Role of Pressure tactics, Communal organizations, Role of Mass media.
- II.3. Public Opinion, Interrelation between politics and society, Politicization in Public life

References

1. Harold A Gould, Politics and caste, Chanakya Publications
2. R T Jingham, Text Book of Political Sociology, OUP
3. Ali Asaraf & L N Sharma, Political Sociology, University Press Pvt Ltd, Hyderabad

- Haralambos - Themes and Perspectives
- Bhatnagar,G.S - Education and Social Change
- Brookover,W.B.& Gottlieb,D - A Sociology of Education
- Brown,F.J - Educational Sociology
- Chesler,M.A.
- & Cave,W.M. - A Sociology of Education: Access to Power and Privilege
- Cook,L.A & Cook,E.F - A Sociological Approach to Education
- Friere.P. - Pedagogy of the Oppressed
- Illich.I - Deschooling Society
- Mathur,S.S - A Sociological Approach to Indian Education

SEMESTER IV

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC4 E 09 GUIDANCE AND COUNSELING

Objectives

- To provide a basic understanding about guidance and counseling
- To create awareness of the different techniques and the process of counseling
- To familiarise with the areas of counseling
- To recognize the significance of counseling in contemporary society

MODULE 1 INTRODUCTION

1.1 Counseling: Meaning and Definition, Guidance: Meaning and purpose, Difference between guidance and counseling

1.2 Goals of Counseling-immediate and long-term, Relevance of counseling

1.3 Types of counseling: Crisis counseling, Facilitative counseling, preventive counseling,

Development counseling, Group Counseling

MODULE 2 PROCESS AND TECHNIQUES OF COUNSELING

2.1 Counseling process, Preparation for Counseling, Proceeding of Counseling, Follow up

2.2 Variables affecting Counseling process, Counselor-counselee relationship

2.3 Techniques of Counseling: observation, listening, responding, non-verbal

Behavior , communication, questioning, silence, transference.

MODULE 3 AREAS OF COUNSELING

3.1 Family and marital Counseling,

3.2 Educational and vocational Counseling,

3.3 De-addiction Counseling.

MODULE 4 MODERN TRENDS IN COUNSELING

4.1 Problem solving-role of Voluntary and non- Voluntary agencies

4.2 Transactional analysis

4.3 Rational emotional therapy

Reference

Henry Clay Lindgren - An Introduction to Social Psychology(2nd Ed)

Guidance and Counselling - Sister Mary Vishala

Gladding, S.T. - Counseling: A comprehensive profession

Bhatnagar, Asha and Gupta, Nirmala (Eds.) - Guidance and Counselling: A practical Approach

Sharma, R.N. & Rachana Sharma - Guidance and Counselling in India

Nayak, A.K. - Guidance and Counselling.

Gibson, R.L. and Mitchell, M.H. - Introduction to Guidance

Course Code	Title	Type	Credit
HIS 1A 01	Personality Development	Audit	4

Ability Enhancement Course (AEC)

Paper I: PERSONALITY DEVELOPMENT

Module – I: Image Building and Self Awareness

Aptitude and personality assessment and testing - Developing Self Awareness - Projecting a winning personality - How to match the peer group expectations as a professional - How to be a consistent Performer - Power of Positive thinking - Developing Competitive coping Mechanism - Understanding Professional Etiquette - Professional Mannerism and Social Science Professional

Module – II: How to face an Interview

Motivation activities, leadership activities, team building activities, assertiveness activities, time management techniques - Stress management techniques, creativity and ideation - Basic communication skills- listening skills and barriers; JAM sessions, debates, elocution, etc. - persuasive communication, convincing Skills, conversations - Motivation – Developing Soft skills - Personal grooming - preparation for interview – Resume writing - Types, contents, formats - Interview handling - do's and don'ts

Module – III: Professional Etiquettes

Formal Look – Understanding the demands of the profession - get together Peer to Peer communication - Work ethics - Hierarchy communication - Handling complaints and grapevine - Developing professionalism - Developing and maintaining social contacts

Reference

- Barun K. Mitra, Personality Development and Soft skills, OUP, New Delhi, 2016.
 Nidhi Tibrewal, Discover Yourself, Partridge India, 2016
 Stephen R. Covey, The 7 Habits of Highly Effective People, Free Press, 1989
 Gopika Kumar, Personal Power Equation, Adhyyan Books, 2018.

Course Code	Title	Type	Credit
HIS 2C02	History of Modern Kerala: Problems and Perspectives	Core	5

HIS 2C02 - History of Modern Kerala: Problems and Perspectives

I. Colonial and modern historiography

Early Surveys and Administrators- Buchanan - Missionary Writings – Samuel Matteer and Gundert- Gazetteers and Manuals- William Logan, Nagam Aiya and Velu Pillai- search for Primary sources – Babington, Bruce Foot- colonial ethnography – Edgar Thurston and L K Anantha Krishna Aiyar. Histories of princely states – Travancore and cochin-Emergence of modern Historiography- K P Padmanabha Menon – imagination of historical past of Kerala by the social reformers and nationalists- development of scientific histories- emerging trends in history writings in Kerala- ecology and environmental histories – women and gender history – Dalit subaltern history- peasant history-history of caste slavery- history of communities - local history- intersectional histories – critical histories.

II. Modern Kerala and the phases of change

Kerala in the 18th century -changes in the economy and society -Mysorean rule in administration and land relations - colonialism in Kerala- from trade to conquest- changes in property and legality - governance and administrative practices- missionary activism in social life - changes in agriculture- industry and social classes-formation of public sphere.

III. Social modernization and reform process

Caste and social reform-religious reform- the idea of ‘Renaissance’ – lower caste protests and the radical agenda in the reform process- social reformers and their positions and strategies-- notions of historical past by reformers- Poykayil Appachan and Chattampi swamikal - Literature and social imaginations -novel as historical knowledge- Indulekha and Saraswathi Vijayam

IV. Formation of united Kerala

National movement and radical politics -popular movements –formation of united Kerala- land reform and its consequences- land reform and landlessness among the Adivasis and Dalits- development experiences- literacy and health care- socio-economic inequality and Kerala model development.

Readings:

A P Ibrahim Kunju, Mappila Muslims of Kerala.

A P Ibrahim Kunju, Mysore Kerala Relations in 18th Century

A Sreedhara Menon, A Survey of Kerala History, DC Books, Kottayam.

A Sreedhara Menon, Makers of Modern Kerala

Adrain C Mayer, Land and Society in Malabar.

Andalat, Rekha illatha Charithram,

Ashin Dasgupta, Malabar in Asian Trade

B Shobhanan, S Ramachandran Nair and K J John, History of freedom Movement in Kerala

C Balan, Reflections on Malabar, NAS College Kanhangad, 2000.

C Kesavan, Jivitha samaram

Charles Dias, [ed], Kerala Spectrum: Aspects of Cultural Inheritance, Indo-Portuguese Cultural Institute, Cochi, 2006.

Dilip M Menon, Caste Nationalism and Communism in South India

Dilip M Menon, The Blindness of Insight: Essays on Caste in Modern India, Navayana, New Delhi 2006.

Donald Herring, Land to the Tiller: The Political Economy of Agrarian Reform in South Asia, Yale University Press, 1983.

E K G Nambiar, Agrarian India Problems and Perspectives, Association for Peasant Studies University of Calicut, 1999.

E M S Nampoothiripad, Keralam Malayalikalute Mathrubhumi [1948] Chintha Publishers, Thiruvananthapuram 2016.

Elamkulam Kunjan Pillai, Ilamkulam Kunjanpillayute therenjoduth krithikal, N Sam [ed], International Center for Kerala Studies University of Kerala, Thiruvananthapuram, 2005.

G Arunima, There Comes Papa: Colonialism and the Transformation of Matriliney in Kerala, Malabar, c. 1850-1940, Orient BlackSwan, 2003.

George K Lietaen, The First Communist Ministry in Kerala

George Mathew, Communal Road to Secular Kerala

Govindan Parayil, Kerala The Development Experience: Reflections on Sustainability and Replicability, Zed Books, 2000.

J Devika, Engendering Individuals: The Language of Re-Forming in Twentieth Century Keralam, Orient Longman, 2007.

K Gopalankutty, Malabar Padanangal

Course Code	Title	Type	Credit
HIS 2C03	State and Society in Medieval India	Core	5

HIS 2C03 - State and Society in Medieval India

Module I: Historiographical Understanding of the Medieval India

Medieval in Colonial perspectives- stereotypical constructs- myth of hostile religions- equating religion and State- 'Islamic State'- representation of [despotic] State, [closed] economy and [stagnant] society ; Nationalist Writings- response to colonial writers- approval of colonial stereotypes- Nationalistic enthusiasm; Marxist Understanding- Perspectival changes- challenging the colonial and nationalist approach- focus to economic aspects - periodization- factors and relations of production –Land and property rights .

Module II: State and Economy in Medieval India

Concept of state in medieval India- theories- imperial polities in medieval India (Turkish, Afghan & Mughal)- Sultan- nobility & Ulema- structure of administration: iqta, mansab, jagir- Revenue administration- mode of Assessments- batai, Zabt, Dahsala, Kankut etc.

Nature of Mughal State- Debate; Decline of Mughal State- Theories

South Indian Polity- nature-Debate

Regional Powers: Rajputs- Marathas- Bahmini- Aspects of State

Local administration: administrative divisions- local ruling classes (chieftains, zamindars and village oligarchies)- Village community- Balutadars, ayagars etc.

Process of Production and Exchange: Agriculture- Industry- Shipping -Trade- types- Local, Overland, Overseas- Exports- imports- Ports- Markets- Urbanization.

Module III: Religion and Social stratification in Medieval India

Islam- spread- growth- theories-popular Islam-Sufism- syncretic culture.

Guru Nanak and Sikhism- Ideals- spread

social stratification-Caste- purity/ pollution-caste oppression- practice of untouchability- influence of Islam- Bhakthi movement- Saint Poets- Shaivism- Vaishnavism.

Position of women- Domestication- Involvement in Production process.

Module IV: Science Technology and Culture

Scientific Inventions- Mathematics- astronomy- medicine- Technological advancement –
Literary contributions- Persian, Sanskrit and regional languages- Encounters of Cultures-
Architecture and Painting-

Reading List

Mohammed Habib, *Studies in Medieval Indian Polity and Culture, The Delhi Sultanat and its Times*, [edited by Irfan Habib], OUP, 2016.

Irfan Habib, *Medieval India. The Study of a Civilization*, NBT , 2008.

-----, *Agrarian System of Mughal India, 1556-1707*, OUP, New Delhi, 2000(1963)

-----, *Essays in Indian History*, Tulika, New Delhi, 1995

-----, *Technology in Medieval India, 650-1750*, Tulika, New Delhi, 2016 (2008).

-----, *Interpreting Indian History*, NEHU Publishing, Shillong.

Satish Chandra, *History of Medieval India*, 2007.

-----, *Essays on Medieval Indian History* , OUP, 2003

Jackson, *The Delhi Sultanate, A Political and Military History*, CUP, 1999

Sunil Kumar, *Emergence of Delhi Sultanate,AD1198-1286*, Permanent Black, 2010.

J.F.Richards, *The Mughal Empire*, CUP, 2016

Stewart Gordon, *The Marathas*, CUP, 1998

Stephen P Blake, *Shajahanabad, the Sovereign City in Mughal india,1639-1739*, CUP,New Delhi, 1993

Nurul Hasan, *Religion, State and Society in Medieval India*, 2005

Ibn Hasan, *Central Structure of the Mughal Empire*, Munshiram Manoharlal, 1936

R.M. Eaton ed., *India's Islamic Traditions, 711-1750*, OUP, 2006

Harbans Mukhia, *Mughals of India*, Wiley-Blackwell, 2004

Muzaffar Alam & Subrahmanyam, eds., *The Mughal State*, OUP, 2000

Herman Kulke ed., *The State in India 1000-1700*, OUP, 1995

Inversion of square matrices of not more than 3rd order - Solving system of simultaneous linear equations.

15 Hours

Module II

Theory of Equations: Meaning - types of equations - Simple linear and Simultaneous equations (only two variables) eliminations and substitution method only - Quadratic equation factorization and formula method ($ax^2 + bx + c = 0$ form only) - Problems on business applications.

10 Hours

Module III

Progressions: Arithmetic Progressions - Finding the 'n'th term of an AP and also sum to 'n' terms of an AP - Insertion of Arithmetic means in given terms of AP and representation of AP - Geometric Progression: Finding 'n'th term of GP - Insertion of GMs in given GP and also representation of GP - Mathematics of Finance - Simple and compound interest (Simple problems only).

15 Hours

Module IV

Meaning and Definition of Statistics - Scope and limitations - Statistical enquiries - Scope of the problem - Methods to be employed - Types of enquiries - Presentation of data by Diagrammatic and Graphical Method - Formation of Frequency Distribution.

10 Hours

Module V

Measures of Central Tendency - Arithmetic Mean - Median - Mode - Geometric and Harmonic Mean - Measures of variation and standard, mean and quartile deviations - Skewness and Kurtosis - Lorenz curve. Analysis of Time Series: Methods of measuring - Trend and Seasonal variations - Index number - Unweighted indices - Consumer price and cost of living indices.

10 Hours

Reference Books:

1. Sundaresan and Jayaseelan - An Introduction to Business Mathematics and Statistical Methods.
2. Dr. A K Arte & R V Prabhakar - A Text Book of Business Mathematics.
3. Sanchethi and Kapoor- Business Mathematics.
4. Gupta S.P- Statistical Methods
5. Navaneethan P- Business Mathematics
6. R.S.N. Pillai, Mrs. Bhagavathi - Statistics
7. P.R. Vittal - Business Mathematics and Statistics.

SDC2BF05—ORGANISATIONAL BEHAVIOUR AND COMMUNICATION

Semester : II

Credits: 4

Internal: 20, External: 80

Hours: 60

Learning objectives:

- be able to understand and analyze the individual needs, feelings, aspirations;
- develop skills needed to plan for the implementation of change in an organization;
- Identify and develop effective motivational and leadership skills.

Module-I

Introduction

Definition & Meaning, Why to study OB, An OB model, New challenges for OB Manager LEARNING: Nature of learning, How learning occurs, Learning & OB Case Study Analysis

10 Hours

Module-II

Personality:

Meaning & Definition, Determinants of Personality, Personality Traits, Personality & OB, Perception: Meaning & Definition, Perceptual process, Importance of Perception in OB - Motivation: Nature & Importance, Herzberg's Two Factor theory, Maslow's Need Hierarchy theory, Alderfer's ERG theory Case Study Analysis

10 Hours

Module-III

Communication:

Importance, Types, Barriers to communication, Communication as a tool for improving Interpersonal Effectiveness , Groups in organization : Nature, Types, Why do people join groups, Group Cohesiveness & Group Decision Making- managerial Implications, Effective Team Building , Leadership : Leadership & management, Theories of leadership- Trait theory, Behavioural Theory, Contingency Theory, Leadership & Followership, How to be an Effective Leader - conflict: Nature of Conflict & Conflict Resolution, transactional Analysis : An Introduction to Transactional Analysis Case Study Analysis

20 Hours

Module-IV

Organisational Culture

: Meaning & Definition, Culture & Organisational Effectiveness, Human resource Management: Introduction to HRM, Selection, Orientation , Training & Development, Performance Appraisal, Incentives

10 hours

Module - V

Organizational Change

Importance of Change, Planned Change & OB Techniques , International OB : An Introduction to Individual & Interpersonal Behaviour in Global Perspectives.

10 Hours

Suggested Readings:

1. Steven McShane & Van Glinar, "Organizational Behavior", Tata McGraw Hill Publishing Co.
2. Stephen Robbins, "Organizational Behavior". Prentice Hall India Pvt. Ltd New Delhi.
3. Fred Luthans, "Organizational Behavior". McGraw Hill Book Company.
4. Kavita Sharma, "Organizational Behavior", Pearson India.
5. Ricky Griffin & Georgy Moorehead, "Organizational Behavior", Hough Co. Boston.

SDC2BF06

COST ACCOUNTING

Semester : II

Credits: 5

Internal: 20, External: 80

Hours: 75

Objectives:

- > To familiarize the students with the various concepts and elements of cost.
- > To create cost consciousness among the students.

Semester : III
Credits : 4

Total Hours : 60
Course Code : SDC2BF10

Objectives:

- This course is designed to help students get a sound understanding of the business of life, insurance and key operational aspects of the same.

Module I

Definition, characteristics, need & importance/Advantages of insurance
Introduction to the Principles of Life Insurance
Principle of utmost Good Faith/Insurable Interest/Principle of Indemnity

10 Hours

Module II

Premium and Bonuses
What is Premium/Premium calculation and Actuarial valuation/What is Bonus
Creditors rights in life insurance

10 Hours

Module III

Life Insurance Product
Traditional / Unit Linked Policies; Individual and Group Policies
With Profit and Without Profit/Whole Life Products, Interest sensitive product
Term Assurance/Annuities, Endowment Assurance etc.

10Hours

Module IV

Underwriting
Introduction/Classification of Risks/Financial Underwriting
Insurance Documents
Policy Conditions
Claims
Group Insurance
Life Insurance Marketing

15 Hours

Module V

Economic basis of life and health insurance, Demand for and supply of life and health insurance, Factors which influence the supply side of life insurance, The production of life and health insurance, Benefits derived by society through insurance, Costs of insurance to society, Scope of coverage of risks, How much insurance does a man need?,

15 HOU

Reading Lists & References:

Essential Reading: Stratadigm Workbook developed for the B.Voc. program
Suggested Reading: IRDA Publications

Books,USA

5. C Jeevanandam: " Foreign exchange, Concepts, practices & control", Sultan Chand &sons.

SDC4AT16 (E2) RISK MANAGEMENT AND INSURANCE

Lecture Hours per week: 5

Internal: 20, External: 80

Credits: 5

Total Hours : 75

Course Objectives:

- To enable the students to understand risk, risk management process and techniques.
- To help the students to learn about risk financing.
- To understand risk management applications.

Course Details:

Module I : Risk: Meaning of risk - Degrees of risk - Cost of risk - Various elements of cost of risk - Sources of risk - Types of risk - Pure risk and speculative risk - Acceptable and non acceptable risks – Static and dynamic risk

15 Hours

Module II : Risk management - Characteristics of risk management - Significance - Principles of risk management - Objectives - Risk and risk management process – Risk identification - Evaluation - Risk management techniques -Selecting and implementing risk management techniques - Risk Management Information System - Organisation of risk management in business - Methods of risk management - Identification, measurement and control of risk - Evaluation, frequency and severity of losses - Pooling of risk - Insurance as risk pooling arrangements - Transferring of risks.

20 Hours

Module III : Commercial Risk Management Applications - Property - Liability - Commercial property insurance -Different policies and contracts - Business liability and risk management insurance - Workers' compensation and risk financing.

15 Hours

Module IV : Risk Management Applications - Loss of life - Loss of health - Retirement planning and annuities - Employee benefits - Financial and estate planning.

10 Hours

Module V : Risk Management Environment - Industry - Functions and organisation of insurers – Government regulation of insurance sector - IRDA - Privatisation of insurance business in India - Changes in Insurance Act - Insurance intermediaries - Insurance products pricing -Claim valuation – Foreign insurers in India.

15 Hours

Reference Books:

1. Rejda, George E: Principles of Risk Management and Insurance, Latest Edn, Addison Wesley Longm
2. McNamara: Principles of Risk Management and Insurance, Addison – Wesley
3. Dorfman: Introduction to Risk Management and Insurance, Prentice Hall.
4. Williams: Heins, Risk Management and Insurance, McGraw Hill Pub.
5. James S.Trieschman, Sandra G. Gustavsonh, Robert E. Hoyt: Risk management and Insurance, Thomson Asia Pvt. Ltd., Singapore.

B. Voc Programme in Agriculture

Detailed Syllabus

SEMESTER I

Course No. 1.3

Course Code: GEC1ES03

Course Title: Fundamentals of Environmental Science

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives:

- To enable the students to acquire knowledge on the importance of Environmental Science
- To equip the students as volunteers to guard the environment.

MODULE 1 (15 Hours)

1. Methodology and perspective of science. Types of knowledge, practical, theoretical and scientific knowledge. What is science, what is not science – Hypothesis – Theories and laws of science, observations, evidences and proofs.

2. Definition, Scope and Importance of Environmental Science: Multidisciplinary nature of the environmental Science; Scope and importance; Need of Environmental awareness Interrelationship of ecology with other disciplines. Introduction to global environmental problems.

3. Components of the environment:

a. The atmosphere or the air: Layers of Atmosphere , Composition of air; importance of atmosphere, meteorological conditions and air circulation.

b. The hydrosphere or water: Importance of water, distribution of fresh water at global, national and state level. Hydrological Cycle.

c. Lithosphere or the rock and the soil: Elementary composition of rocks in the earth crust.

Types of rocks; Process of soil formation: Physical weathering, Chemical weathering of rocks; Role of soil in shaping the biosphere

MODULE 2 (15 Hours)

1. Environmental Factors:

a. Climatic Factors-Light, Temperature of Air (atmospheric temperature), Rainfall (precipitation), Humidity of air, atmosphere (gases and wind), fire.

b. Topographic Factors: height of mountains, direction of mountains and valleys, steepness of slope and exposure of slope

c. Edaphic factors: Soil-formation, soil profile, soil erosion, soil conservation

d. Biotic factors: Intraspecific interactions; Interspecific interactions: Neutralism, Commensalism, Mutualism, Parasitism, and Predation.

e. Ecological adaptations of plants (Hydrophytes, mesophytes, xerophytes, and halophytes) and animals (aquatic conditions-hydrocoles; amphibious conditions or sec. hydrocoles), terrestrial (mesocoles and xerocoles)

MODULE 3 (15 Hours)

Ecosystem: Definition; Components of ecosystem; Abiotic components: Light, Temperature, Pressure, Water, Wind, Soil; Biotic components: Energy flow in an ecosystem: Primary production, Secondary production; Food chain: Grazing food chain, Detritus food chain; Ecological pyramids: Pyramid of number, Pyramid of biomass, Pyramid of energy; Food web; Ecological indicators. Biogeochemical cycles: a) Gaseous cycles: Oxygen cycle, Carbon cycle and Nitrogen cycle. b) Sedimentary cycles: Phosphorus cycle, Sulphur cycle.

MODULE 4 (15 Hours)

Population Ecology and Community Ecology: Population characteristics- Population growth and its dynamics; natality, mortality, growth patterns; Age distribution, Malthusian theory; Community structure, succession and climax, Species diversity, ecological dominance, ecotone, niche, guild, edge effect, ecological equivalent, succession and climax

Major Ecosystems: Terrestrial Ecosystem-Forest, grass land, arid, crop land

Wet land-Ponds, lakes, rivers, oceans, estuaries

Major terrestrial Biomes-Tropical Savannah, Tropical rain forest and deserts

References

Ecology and Environment ,2008-2009.P. D. sharma (Rastogi Publications, Meerut)

A text book of Environmental Studies.,2006.D.K.Asthana, Meera Asthana (S.Chand&Co.)

Essential Environmental Studies,2009.S.P.Misra,S.N.Pandey,(Ane Books Pvt.Ltd,Chennai)

Environmental Education – A Conceptual Analysis. P.Kelu,University of Calicut publication

Text Book of Environmental Studies, Erach Bharucha, 2005.Orient Longman Pvt.

Ltd., Ernakulam

Course No. 1.4

Course Code: SDC1AG01

Course Title: Fundamentals of Agronomy

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives:

- To enable the students to acquire knowledge on importance of agriculture and various types of farming.
- To study the fundamentals of agronomy and classification of field crops

MODULE 1

12 Hrs

Importance of agriculture in India and Kerala, Hunger and food security, Agronomy, Sustainable agriculture, Subsistence agriculture, commercial agriculture, Extensive and intensive agriculture,

Peasant farming, Urban agriculture, Agribusiness, Agricultural seasons in India and Kerala, Rainfed and irrigated agriculture.

MODULE 2

12Hrs

Agricultural classification of crops, Agronomic classification of crops, Botanical classification of crops, Major farming systems in Kerala and Cropping Intensity, Methods of sowing/planting - planting geometry and its effect on growth and yield.

MODULE 3

12Hrs

Soil and climatic requirements, varieties, cultural practices, special systems of cultivation, harvesting and processing of major cereals and millets, pulses, tubercrops, rice, maize, finger millet, cowpea, tapioca, sweetpotato, amorphophallus, yams, coleus, arrowroot etc

MODULE 4

12Hrs

Soil productivity and fertility. - Crop nutrition - nutrients -classification - Nutrient sources- organic manures -fertilizers - biofertilizers .Nutrient recycling through manures and fertilizers - organic manures. Fertilizers and fertilizer use- management of fertilizers .Biological nitrogen fixation, Green manure crops and cover crops .Integrated Nutrient Management.

MODULE 5

12Hrs

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition. Water resources and in India and Kerala. Irrigation methods - drip and sprinkle irrigation systems. Water management of different crops like rice, banana, coconut, cowpea, and vegetables.

Text Books:

1. Balasubramaniyan, P and Palaniappan, S.P. 2001. *Principles and Practices of Agronomy* AgroBios(India)Ltd., Jodhpur.
2. Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology : An Analysis of World Food Production Systems*. W.H. Freeman and Company, San Francisco
3. De, G.C.1989.*Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.
4. Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.
5. Harlan, J.R. 1992. *Crops and Man*. American Society of Agronomy & Crop Science Society of America, Madison, WI.
6. Havlin, J. L., Beaton, J. D., Tisdale, S.L., and Nelsohn, W.L. 2006. *Soil Fertility and Fertilizers: An Introduction to Nutrient Management* (7 ed.). Pearson Education, Delhi.
7. ICAR.2006. *Hand book of Agriculture*, ICAR, New Delhi.
8. Janick, J., Schery, R.W., Woods, F.W., and Ruttan, V.W. 1974. *Plant Science: An Introduction to World Crops*. W.H. Freeman and Company, San Francisco.
9. Noor Mohammed.1992. Origin, diffusion and development of agriculture. In: Noor Mohammed (ed.), *New Dimensions in agricultural geography: Vol.1.Historical Dimensions of agriculture*. Concept publishing Co., New Delhi.pp29-75.
10. Reddy.T.Y and Reddy, G.H.S.1995.*Principles of Agronomy*, Kalyani Publishers, Ludhiana.

11. Chatterjee, B.N. and Maiti, S.1985.*Principles and Practices of Rice Growing*. Oxford & IBH Publishing Co., New Delhi.

Course No. 1.5

Course Code: SDC1AG02

Course Title: Fundamentals of Horticulture

Credits: 4

Total Contact Hrs: 60Hrs

Objectives

- To acquaint with importance, division and classification of horticultural crops.
- To understand the basic principles and types of plant propagation.

MODULE 1

12 Hrs

Horticulture - definition, importance, division and classification of horticultural crops. Importance of horticulture in India and Kerala. Orchard planning, layout, planting systems - management practices. Tree forms and functions - Training and pruning in horticultural crops - principles and methods, techniques of training and pruning, fruit thinning.

MODULE 2

12Hrs

Phases of growth and development - vegetative/ reproductive balance; Flowering in plants - bearing habit and its classification- factors associated with flowering and fruit set. Fruit set and development - structure and process concerned with setting. Fruit drop - factors affecting and control measures - unfruitfulness - internal and external factors. Seedlessness in horticultural crops; significance and induction.

MODULE 3

12 Hrs

Plant propagation - definition and basic concepts, sexual and asexual types - advantages and disadvantages. Media, containers, potting, re potting and pre planting treatments. Asexual propagation - propagation by cuttings, types of cuttings, factors affecting rooting of cuttings. Propagation by layering - types of layering.

MODULE 4

12 Hrs

Propagation by grafting - methods of grafting - development of graft unions, separation and after care. Stock-scion relationship - Graft incompatibility - factors affecting incompatibility. Propagation by budding, methods of budding - A comparative study between grafting and budding.

MODULE 5

12 Hrs

Nursery - site selection, layout - components of a nursery - production unit, sales unit, display area, management and maintenance, propagation unit - close planted progeny orchards. Plant propagating structures-.greenhouse, glasshouse, hot bed, cold frame, lath house, net house, mist chamber.

Text books:

1. Bose, TK., Mitra, SK. and Sadhu, K. 1986. *Propagation of tropical and subtropical horticultural crops*. NayaProkash, Calcutta.
2. Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
3. Edmond, JB., Sen, TD, Andrews, TS and Halfacre, RG. 1977. *Fundamentals of Horticulture*. Tata McGraw Hill, New Delhi.
4. Hartmann, HT. and Kester, DE. 1986. *Plant propagation - Principles and practices*. Prentice-Hall, New Delhi.
5. Leopold, A.C. and Kriedeman, P.E. 1975. *Plant Growth and Development*. Tata McGrawHill Publishing Co. Ltd., New Delhi.
6. Chadha, K. L. 2003. *Handbook of Horticulture*, ICAR, New Delhi. Choudhury, B. 1983. *Vegetables*. National Book Trust, New Delhi.
7. Das, P. C. 1993. *Vegetable crops in India*. Kalyani Publishers
8. Gopalakrishnan, T. R. 2007. *Vegetable Crops*. New India Publishing Agency, New Delhi.
9. Hazra, P. and Som, M. G. 1999. *Technology for vegetable Production and Improvement*. NayaProkash, Calcutta

Course No. 1.6

Course Code: SDC1AG03

Course Title: Fundamentals of Agricultural Engineering

Credits: 4

Total Contact Hrs: 60 Hrs

Objectives

- To familiarize with fundamentals of water management.
- To acquaint with various soil conservation methods.

MODULE 1

12 Hrs

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition.

MODULE 2

12 Hrs

Methods of determining water requirement-effective rainfall. Methods of irrigation and their engineering aspects - surface irrigation, sprinkler, drip - Agronomic techniques to improve water use efficiency- factors affecting water use efficiency.

MODULE 3

12 Hrs

Soil erosion- nature and extent of erosion; types- soil erosion by water- different forms- Soil conservation vs. water conservation - agronomic measures- mechanical measures- Role of grasses and pastures in soil conservations; Wind breaks and shelter belts.

MODULE 4

12 Hrs

Water harvesting techniques - in situ and ex situ water harvesting methods - Farm ponds, percolation ponds or wells, check basin, minor irrigation tanks.

MODULE 5

12 Hrs

Surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields.

Text books:

1. Dhruvanarayana, V.V. 1993.*Soil and Water Conservation Research in India*. ICAR, New Delhi.
 2. Gurmel Singh, C. Venkataraman, G., Sastry, B. and Joshi, P. 1990.*Manual of Soil and Water Conservation Practices*. Oxford and IBH Publishing Co., New Delhi.
 3. Hansen, V.Eh., Israelsen, O.W., and Stringham, G.E. 1979. *Irrigation Principles and Practices* (4th Ed.). John Wiley and Sons, New York.
 4. Lenka, D. 2001.*Irrigation and Drainage*. Kalyani Publishers, New-Delhi.
 5. Mal, B. C. 2002.*Introduction to Soil and Water Conservation Engineering*, Kalyani Publishers, New-Delhi.
 6. Michael, A.M and Ojha, T.P. 2005.*Principles of Agricultural Engineering-Vol.II*. Jain Brothers, New Delhi.
 7. Michael, A.M. 1988.*Irrigation Theory and Practice*. Vikas Publishing House Pvt. Ltd., New Delhi.
-

Course No. 1.7

Course Code: SDC1AG04

Course Title: Fundamentals of Agronomy and Horticulture – Practicals

Credits: 6

Total Contact Hrs: 90 Hrs

Objectives

- To develop skill in propagation and cultivation aspects of horticultural crops.
- To familiarize with cultivation aspects of cereals and millets, pulses and tuber crops.

Contents

1. Identification of cereals and millets, pulses, and tuber crops.
 2. Different methods of sowing; direct seeding: broadcasting, dibbling and drilling-transplantation.
 3. Seed treatment - Rhizobium inoculation of leguminous crops.
 4. Identification of manures -organic manures: bulky and concentrated manures
Fertilizers: Straight, complex and mixed fertilizers - identification and preparation.
 5. Fertilizer recommendation and calculation for major cereals and pulses.
 6. Familiarization with green manure crops and cover crops.
 7. Familiarization to Different planting systems and layout
 8. Propagation methods - sexual propagation -seed viability tests, dormancy breaking methods.
 9. Propagation structures - mist chamber, green house, hot beds etc.
 10. Propagation by cuttings.
 11. Propagation by layering - types of layering.
 12. Propagation by grafting - methods of grafting
-

References:

- Human Resource Management- Text and Cases-- VSP Rao
- Human Resource Management – PravinDurai 2. Human Resource Management—Snell, Bohlander
- Personal Management and Human Resources—VenkataRatnam .Srivasthava
- A Hand Book of Personnel Management Practice—Dale Yolder

Course No. 2.4
Course Code: SDC2AG05
Course Title: Plantation Crops, Spices and Fruits
Credits: 4
Total Contact Hrs: 60 Hrs

Objectives

- To acquaint with the cultivation aspects of Plantation crops, spices and fruit crops.

Module1**15 Hrs**

Plantation crops, Introduction - importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids - nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of :-coconut and Rubber.

Module2**12 Hrs**

Plantation crops, Importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids. Nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of cashew, tea and coffee.

Module 3**12 Hrs**

Spices, Definition - classification - importance to the state. Origin - distribution - area, production .varieties - climate, soil - propagation, nursery management - site selection, layout, planting - crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: Pepper, cardamom, ginger, and nutmeg.

Module 4**15Hrs**

Fruits, Importance and scope of commercial fruit production - Global scenario of fruit production and export - Present status of fruit production in the state and in the country - problems and prospects.Crop management practices - selection and preparation of planting materials, field preparation and planting, manuring, irrigation, weed management, use of bio-regulators, other cultural operations. Cultural practices for quality improvement. Maturity indices, harvesting, grading, packing, storage and ripening techniques. Industrial and export potential- of Crops- Banana, mango,and pineapple.

Module 5**6 Hrs**

Fruits, Management practices of crops gaining importance in the state recently (mangosteen, rambutan, durian).

Text books:

1. Chadha, K.L.2001. Hand Book of Horticulture,ICAR, New Delhi.
 2. Kumar.N, Abdul Khader.J.B.M.Rangaswami.P. and Irulappan., 1993. Introduction to spices
 3. Menon.K.P.V. and Pandalai.K.M. 1960. The coconut Palm - a monograph. Indian Central Coconut Committee, Ernakulam.
 4. Purselove. J.W., Brown, E.G.Green, C.L. and Robbins, S.R.G.1981.SpicesVol-I & II.
 5. Pruthi.J.S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
 6. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post HarvestTechnology, ICAR, New Delhi, India.
 7. Amar Singh, 1986. Fruit Physiology and Production.Kalyani Publishers, New Delhi.
 8. Bose, T.K, Mitra,S.K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
 9. Hayes,W.B. 1957. Fruit Growing in India.Kitabitan, Allahabad.
 10. Kumar, N. 1997 (6th Edition).Introduction to Horticulture.Rajhalakshmi Publications, Nagercoil
 11. Mitra,S.K, Bose,T.K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers , Calcutta.
 12. Naik,K.C. 1949. South Indian Fruits and Their Culture.Varadachari Co., Madras.
 13. Samson, J.A. 1980. Tropical Fruits.Longman group, London.
-

Course No. 2.5**Course Code: SDC2AG06****Course Title: Fundamentals of Seed Technology****Credits: 4****Total Contact Hrs: 60 Hrs**

Objectives

- To familiarize with the fundamentals of plant breeding.
- To familiarize with the basics of seed technology.

Module1: Morphology and systematics of crop plants**20 Hrs**

General features of important families - morphology of roots, stem, leaves, flowers, fruits and seeds.Introduction to field crops - Classification of field crops. Botany and economic importance of crops like Rice, Ragi, cowpea, Bitter Gourd, Cucumber, Brinjal, Chilli, Tomato, Soyabean,coconut,Groundnut, Gingelly, Tapioca, Cotton, Sweet potato, Rubber, Mango, Cashew, Pepper, Papaya and Banana.

Module 2: Principles of Seed Technology**20 Hrs**

Introduction to Seed Production, Importance of Seed Production,The concept of a seed-definition-structure of a seed-seed development process, Definition, Characters of good quality seed,Factors

affecting seed quality - ecological influences , packing practices, harvest and post harvest handling, Genetic and agronomic principles of seed production, Seed testing procedures for quality assessment- Physical, Purity, germination and viability test, Principles of establishing a seed testing laboratory, Post harvest seed management techniques seed extraction-seed processing- drying-cleaning-upgrading-seed blending, Dormancy of seed, role of growth regulators in restoring seed viability, physical agents for increased seed germination, seed vigour etc. Seed treatment, Importance of seed treatment, types of seed treatment, equipment used for seed treatment, Seed packing and seed storage, factors affecting seed longevity during storage and conditions required for good storage, General principles of seed storage, measures for pest and disease control, temperature control, Seed production of major crops - field crops , plantation crops , fruit plants ,spices, ornamental plants , medicinal plants, Different classes of seeds- Production of nucleus, breeder's seed, foundation and certified seed production, Seed certification, procedure for seed certification, field inspection and field counts etc.,

Module 3: Legislation of Seed Technology

20 Hrs

Seed Legislation - Seed Act and Seed Act enforcement, Central Seed Committee, Central Seed Certification Board, State Seed Certification Agency, Central and State Seed Testing Laboratories; Seed Act 2000 and other issues related to seed quality regulation, Organizations involved in seed production i.e., public, quasi, co operative, private etc. Planning seed production programme- seed farm organization-procurement and pricing policy-economics of seed production of different crops; government policy in seed production and study of export potential of seeds.

Text books:

1. Albert F-Hill and O.P. Sharma, 1996. Economic Botany. Tata McGraw - Hill Publishing Company Ltd., New Delhi
2. Chalam, G.V., J. Venkateswarlu. 1966. Agricultural Botany in India-Vol. 1. Asia publishing house, Bombay, New Delhi
3. Daniel Sundararaj, D and G. Thulasidas, 1993. Botany of field crops. Macmillan India Ltd., New Delhi
4. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons INC. USA. Toppan Co. Ltd. Japan
5. 4. Choudhari, T.C. 1982. Introduction to Plant Breeding. Oxford A& IBH Publishing Co., New Delhi
6. 5. Elliot. 1958. Plant Breeding & Cytogenetics. Mc Grow Hill. New York
7. Sharma, J.R. 1989. Principles and Practice of Plant Breeding. Tata McGraw - Hill Publishing Company Limited, New Delhi.
8. Singh, B.D. 2001. Fundamentals of Genetics. Kalyani Publishers. New Delhi. Ludhiana
9. Singh, B.D. 2003. Plant Breeding Principles and Methods. Kalyani Publishers. New Delhi/ Ludhiana.
10. Agrawal, R.L. 1995. *Seed Technology*. Oxford, IBH Publishing Co., New Delhi.
11. Bose, T. K. and Som, M. G. 1990. Vegetable crops in India. Naya Prokash, Calcutta.
12. Das, P. C. 1993. Vegetable crops in India. Kalyani Publishers
13. Dahiya, B.S and Rai, K.N., 1997. *Seed Technology*, Kalyani Publishers.

HIS5D02 HISTORICAL TOURISM

Module I Historicising Travel in India

Travelogues – Ancient – Megasthenese- Pliny – Fa –Hsien

Medieval – Marcopolo – Ibn Batuta-

Modern – Ralf Fitch –Buchanan

Module II Emergence of Destinations

Religious Destinations – Puri, Haridwar, Ajmir ,Sabarimala , Sravanabelgola, Malayattur

Cultural Destinations – Santinekethan , Wardha, Thunchan Paramba

Historical Destinations – Udayagiri, Khandagiri Caves , Mahabalipuram, Hampi, Ajanta Ellora

Fesival Destinations – Prayag, Thrissur, Kannur

Landscape Destinations – Shimla, Ooty, Alappuzha

Sanctuary Destinations – Vedantangal, Gir, Silent Valley

Module III Tourism as Industry

Components of Tourism – Locale- Accommodation- Transport- Homestay – Food – Hospitality

Varieties of Tourism

Eco Tourism

Module IV Kerala and Her Tourist Potential

Natural and Cultural heritage – Hill Stations – Sanctuaries

Thiruvananthapuram – Pathanamthitta- Calicut – Malappuram

Book list

Module I:

1. Viswanath Ghosh, Tourism and Travel Management

2. S.P Gupta, Cultural Tourism

Module II

1. Ratan Deep Singh, Infrastructure Tourism in India

2. Salini Modi, Tourism and Society

Module III

1. Ratan Deep Singh, Dynamics of Modern Tourism

2. Kunol Chattopadhyaya, Tourism Today- Structure, Marketing and Profile

Module IV

1. Ratan Deep Singh, Economic Impact of Tourism development: An Indian Experience
2. A Sreedhara Menon, Cultural Heritage of Kerala

Giddens, Anthony	- The Consequences of Modernity.
Wallerstein Immanuel	- The Modern World System
Sharma, SL	- Development: Socio-Cultural Dimensions.

SEMESTER III

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC 3 E01 ENVIRONMENTAL SOCIOLOGY

Objectives

- To familiarise the students with the basic arguments in environmental sociology
- To introduce theoretical discussions in environmental sociology
- To create an awareness on environmental issues and the need for conservation

MODULE 1 INTRODUCTION

1.1 Environmental Sociology: Nature, Scope and Importance

1.2 Environmental degradation, Environmental Preservation, Environmental Conservation, Environmental Management

1.3 Environment, technology and society, Elements of Social Ecology

MODULE 2 THEORETICAL PERSPECTIVES

2.1 Classical Theories: Marx, Durkheim and Weber on Environmental Concerns

2.2 Emerging Theories: Patrick Geddes, Dunlap and Cattons, Allan Schnaiberg, Ulrich Beck

2.3 Indian thinkers: Radhakamal Mukherjee, Ramachandra Guha

MODULE 3 ENVIRONMENTAL ISSUES

3.1 Issues related to Pollution, Deforestation, Displacement and Relocation: Climate Change, Global Warming, Environmental Migrants

3.2 Ecological Conflicts, Environmental Inequality and Environmental Justice

3.3 Environmental legislations, Environmental Laws in India

MODULE 4 ENVIRONMENTALISM

4.1 Environmentalism, Ideologies of Environmentalism

4.2 Environmental Ethics, Sustainable Development

4.3 Environmental Movements: Green Peace, Chipko movement, Narmada Bachao Andolan,
Silent Valley Movement

References

Giddens, Anthony. 1996 “Global Problems and Ecological Crisis” in Introduction to Sociology. 2nd Edition. New York: W.W. Norton and Co.

Michael Redclift, 1984 Development and the Environmental Crisis, Meheun Co. Ltd.

Munshi, Indra. 2000 “‘Environment’ in Sociological Theory” Sociological Bulletin.

Vol.49, No.2.

Schnaiberg Allan, 1980 The Environment, Oxford University Press. N.Y.

UNDP. Sustainable Development. New York: OUP

World Commission on Environment and Development, 1987. Our common future Brutland report, New Delhi, Oxford University press.

SEMESTER III

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC3 E02 SOCIOLOGY OF WORK AND INDUSTRIAL LIFE

Objectives

- To familiarise with the basic concepts of work and labour
- To identify the role of Industry in modern society
- To analyse Industrial conflicts and their impact on society

IMPROVEMENT OF COURSE

The candidates who wish to improve the grade / grade point of the external examination of a course they have passed already can do the same by appearing in the external examination of the concerned semester along with the immediate junior batch. A candidate will be permitted to improve the CGPA of the Programme within a continuous period of four semesters immediately following the completion of the programme allowing only once for a particular semester. The CGPA for the betterment appearance will be computed based on the SGPA secured in the original or betterment appearance of each semester whichever is higher.

SGPA CALCULATION

SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses taken by a student. After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below:

$$\text{SGPA (S}_j\text{)} = \Sigma(\text{C}_i \times \text{G}_i) / \text{Cr}$$

Where 'S_j' is the j semester, 'G_i' is the grade point scored by the student in the i course, 'C_i' is the credit of the i course, 'Cr' is the total credits of the semester.

CGPA CALCULATION

$$\text{CGPA} = \Sigma(\text{C}_i \times \text{S}_i) / \text{Cr}$$

Where C_i is the credit of the ith semester, S_i is the SGPA of the ith semester and Cr is the total number of credits in the programme. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme. The SGPA and CGPA shall be rounded off to 2 decimal points. For the successful completion of a semester, a student should pass all courses and score a minimum SGPA of 2.0. However, the students are permitted to move to the next semester irrespective of their SGPA.

DETAILED SYLLABUS

CT01. PHYCOLOGY, BRYOLOGY, PTERIDOLOGY AND GYMNOSPERMS (1.5+1+2+1.5 = 6 hours per week)

Phycology

1. Classification of Algae-comparative Survey of important systems - Fritsch-Smith-Round. Criteria for algal classification-Phylogenetic considerations.
2. Biological importance of Planktons.
3. Algal cytology-Basic ideas of cell features-Electron microscopic studies of algal cell, cell wall, flagella, chloroplast, pyrenoid, eyespot- their importance in classification.
4. Reproduction-Different types of life cycles in algae.
5. General account of energy sources and pigments in algae.
6. Economic importance of algae-Roll of algae in soil fertility, algae in industry-Biological importance of phytoplanktons and water blooms.
7. General account of thallus structure, cell ultra-structure, reproduction, relationships and evolutionary trends in the following groups: Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta, Rhodophyta.

References:

1. Fritsch, F.E. The structure and Reproduction of Algae.
2. Smith, G.M. Manual of Phycology
3. Round, F.E, The Biology of Algae.
4. Pold and Wyane. Introduction of Algae.

Bryology

1. General characters and systems of classifications of Bryophytes
2. General account of the anatomy, reproduction, life history and phylogeny of Sphaerocarpaceae, Marchantiales, Jungermanniales, Calobryales, Anthocerotales, Sphagnales, Andreales, Funariales and Polytrichales
3. Origin and evolution of Bryophytes- gametophytic and sporophytic.
4. A general account of fossil Bryophytes and their affinities.
5. Economic importance of Bryophytes.

References

1. Watson E.V. The structure and life of Bryophytes. Hutchinson Univ. Press, London.
2. Cavers F. The interrelationship of Bryophytes. New Phytologist.
3. Kashyap S.R., The Liverworts of Western Himalaya and the Punjab Plains, Vol.I&II. Chronica Botanica
4. Smith G.M. Cryptogamic Botany. McGraw Hill Book Co., N.Y.
5. Parihar N.S. An introduction of Embryophyta: Bryophyta. General Book House, Allahabad.
6. Verdoon, F.M. Manual of Bryology. Ashor & Co., Amsterdam.
7. Shaw, J. and Goffinet, B. Bryophyte Biology. Cambridge University Press.
8. Manju C. Nair, K.P. Rajesh and Madhusoodanan P.V. Bryophytes of Wayanad in Western Ghats. Malabar Natural History Society, Kozhikode.

Pteridology

1. General characters and life history of Pteridophytes.
2. Cytology of Pteridophytes- Chromosome number and polyploidy.
3. Structure and evolution of stele in Pteridophytes.
4. Origin and evolution of Sporangium.
5. Heterospory and seed habit.
6. Development and evolutionary trends in the Gametophytes of Pteridophytes.
7. Apogamy, Apospory and Parthenogenesis.
8. Classification of Pteridophytes: Holttum, Pichi-Sermolli.
9. Comparative morphology, ecology and phylogeny of the following:
 - a) Psilopsida : Rhyniales, Psilophytales and Psilotales
 - b) Lycopsida: Lycopodiales and Isoetales
 - c) Sphenopsida: Hyeniales, Pseudobomiales, Sphenophyllales, Calamitales and Equisetales.
 - d) Filicopsida: General account: Primofilicales, Ophioglossales, Marattiales, Osmundales, Schizaeales, Cyatheales, Gleicheniales, Marsileales and Salviniales.
10. Economic importance of Pteridophytes-Medicinal, Horticulture, Biofertilizer, weeds.
11. General account of the contribution of Indian pteridologists.

References

1. Bierhost, D.W. Morphology of Vascular Plants. Mac Millan Co., New York.
2. Dyer, A.C. The Experimental Biology of Ferns. Academic Press, London.
3. Jermy, A.C. (Ed.): The phylogeny and Classification of Ferns.
4. Kramer, K.U. and Green, P.S. The Families and Genera of Vascular Plants. Narosa, New Delhi.
5. Nampy, S. and Madhusoodanan, P.V. Fern Flora of South India-Taxonomic Revision of Polypodioid Ferns. Daya Publishing House, New Delhi.
6. Abdul Hameed C., Rajesh K.P. and Madhusoodanan P.V. Filmy Ferns of South India. Penta Book Publishers & Distributors, Calicut.
7. Azeez K., Venugopalakrishna Kurup V. and P.V. Madhusoodanan. Spleenworts (Aspleniaceae) of South India. Malabar Natural History Society, Calicut.
8. Venugopalakrishna Kurup V., Azeez K. and P.V. Madhusoodanan. Primitive Ferns of South India. 'V'Publishers, Kottayam.

Gymnosperms

1. Geological time scale and correlated predominant Gymnosperm flora.
Classification of Gymnosperms- Chamberlain's system.
2. Geological horizons. Distribution, morphology, anatomy, reproduction and interrelationship of the following orders (Study of families and types not required)
 - a. Pteridospermales; b. Glossopteridales; c. Caytoniales; d. Cycadaeoidales; e. Pentoxylales; f. Cycadales, g. Ginkgoales; h. Cordaitales; i. Coniferales; j. Taxales; k. Ephedrales; l. Welwitschiales; m. Gnetales
3. Phylogenetic relationship of Gymnosperms.
4. Economic importance of Gymnosperms

References:

1. Andrews, H.N. Studies in Paleobotany, Wiley, N.Y.
2. Banks, H.P. Evolution and plants of the past. Wadsworth.

3. Bierhost, D.W. Morphology of Vascular Plants. Macmillan.
4. Bower, F.O. Primitive Plants. Macmillan.
5. Chamberlain, C.J. Gymnosperms- Structure and Evolution. Univ. of Chicago Press.
6. Foster, A.S. & E.M. Gifford. Comparative morphology of vascular plants. Freeman.
7. Maheshwari, P & V. Vasil. Gnetum. CSIR, New Delhi.
8. Ramanujam, C.G.K. Indian Gymnosperms in time and space. Today & Tomorrow, Dehra Dun.
9. Sewart, W.N. Paleobotany and the Evolution of Plants. Cambridge Univ. Press.
10. Stockey, R.S. Some comments on the origin and evolution of conifers. Canadian J. Bot. 59: 75-82.
11. Taylor, T.N. Reproductive biology in early seed plants. Bioscience 32:23-28.
12. Walton. An Introduction to the Study of Fossil plants.

CT02: MYCOLOGY & LICHENOLOGY, MICROBIOLOGY AND PLANT PATHOLOGY (2.5+2.5+1= 6 hours per week)

Mycology

1. General characters of Fungi: cell-ultra structure, unicellular and multicellular organization, hyphal growth, cell wall composition, nutrition (saprobic, biotrophic, symbiotic, predacious) reproduction (vegetative, asexual, sexual), heterothallism, parasexuality.
2. Classification of fungi by Ainsworth & Bisby (1983), Alexopoulos et al. (1996)- Phylogeny of fungi- Characters used in classification.
3. General account of Myxomycota, Mastigomycota, Zygomycota, Ascomycota, Basidiomycota and mitosporic fungi. Different kinds of spores and their dispersal.
4. Fungi as saprophytes: details of the fungal decomposition of organic matter, coprophilous fungi, lignin degrading fungi, role of fungi in degradation of pesticides.
5. Fungi as symbionts: Mycorrhiza – ectotrophic, orchidaceous and Ericoid mycorrhiza, Vesicular Arbuscular Mycorrhiza - their distribution and significance. Endophytes.
6. Lichenology: General account and systematics of lichens, thallus structure, reproductive bodies, ecological significance and economic importance of lichens.

References:

1. Alexopoulos C.J., Mims, C.W. & Blackwell, M. Introductory Mycology. 4th edition. John Wiley & Sons Inc.
2. Ainsworth, G.C., Sparrow, K.F. & Susmann, A.S. (Eds.). The Fungi - An Advanced Treatise. Vol 1-4. Academic Press.
3. Burnett, J.H. Fundamentals of Mycology. Edward Arnolds.
4. Cariile, M. J. & Watkinson S.C. The Fungi. Academic Press.
5. Deacon, J.W. Introduction to Modern Mycology. Blackwell.
6. Dubey, H.C. An Introduction to Fungi. Vikas Publishers, New Delhi.
7. Hale Mason, E. The Biology of Lichens. 3rd Ed. Edward Arnold, London.
8. Jennigs, D.H. & Lysek, G. Fungal Biology. Bios Scientific Publishers.
9. Mehrotra, R.S. & Aneja, K.R. An Introduction to Mycology. New Age International Publishers.
10. Landecker, Elizabeth Moore. Fundamentals of Fungi. 4th Ed. Prentice Hall.
11. Nair, M.C. & Balakrishnan, S. Beneficial fungi and their utilization. Scientific Publishers, Jodhpur.
12. Nash, T.H. Lichen Biology. Cambridge University Press.
13. Webster, John . Introduction to Fungi. Cambridge University Press.

Microbiology

1. Introduction - main groups of microorganisms and their characteristics -prions, viroids, viruses, bacteria, mycoplasmas and actinomycetes.
2. Bacteria - classification based on Bergey's Manual. Archaeobacteria and Eubacteria. Morphology, ultra-structure, nutrition, genetics
3. Plasmids and their characterization.
4. Cyanobacteria- salient features, morphology, ultrastructure, classification and economic importance.
5. Viruses- General account of plant and animal viruses, bacteriophages and their classification. Isolation, purification, infection, replication and transmission of plant viruses. Detailed study of TMV and T4Phage. 6. Microbial ecology- microbiology of rhizosphere and phylloplane. Sewage disposal, bioremediation

and water purification. Detection of microbes in air and water.

7. Agricultural microbiology - management of agricultural soils, biofertilizers, biopesticides.

8. Food Microbiology - Food spoilage and preservation methods. Microbiology of fermented food - dairy products, bread and other fermented plant products. Microorganisms as source of food- single cell protein.

9. Industrial Microbiology - Production of alcohol, vinegar, antibiotics, vitamins, steroids, vaccines, organic acids, amino acids.

References:

Adams, M R & Moss, M.O. Food Microbiology. New Age International Publishing Ltd., New Delhi.

Brock, T. D. Biology of Microorganisms. Prentice Hall.

Campbell, R. Microbiology. ELBS-Edward Arnold, London.

Carpenter, P.L. Microbiology. W.B. Saunders & Company, Philadelphia.

Dubey, R.C. & Maheswari, D.K. A text book of Microbiology. S. Chand.

Desikachary. Cyanophyta- Monograph

Goodfellow, M. et.al. The Biology of Actinomyces. Academic press.

Kumar, H.D. & Swati Kumar. Modern Concepts of Microbiology.

Mathew, R.E.F. Plant Virology, Academic press.

Pelozar, M.J., Chan, E.C.S. & Krieg, N.R. Microbiology. Tata Mc Graw Hill.

Sharma, P.D. Microbiology & Plant Pathology. Rastogi Publishers, Meerut.

Plant Pathology

1. Principles of Plant Pathology- Causal agents of plant diseases - Biotic causes (fungi, bacteria, virus, mycoplasma, nematodes, angiospermic parasites. Abiotic causes (nutrient and mineral deficiencies, effect of pollution). Koch's postulates. Latrogenic diseases. Seed pathology.

2. Details of different symptoms of plant diseases.

3. Process of infection- mechanical, physiological and enzymatic action. Penetration and entry of pathogens in to host tissue.

4. Host- parasite interaction. Enzymes and toxins in pathogenesis. Defense mechanisms in plants (structural and biochemical).

5. Details of different ways of spread and transmission of plant diseases- wind and water-mediated, seed borne and vector borne.

6. Plant disease management- exclusion, eradication and protection. Different pesticides and fungicides and their application. Biocides in plant protection.

7. Study of the following diseases with reference to the symptoms, causal organisms, disease cycle and control measures:

Bunchy top of banana, Bacterial blight of paddy, Bud rot of coconut, Mahali of Arecanut, Powdery mildew of rubber, Abnormal leaf fall of rubber, tikka disease of Ground nut, Late blight of potato, Blister blight of tea, wheat rust, coffee rust, grey leaf spot of coconut, Phytophthora foot rot of pepper, rhizome rot of ginger and turmeric, angiospermic parasites-Viscum, Dendrophoe.

References

Agrios, G.N. Plant pathology. 4th Ed., Academic Press.

Bilgrami, K.H. & Dube, H C. A Text Book of Modern Plant Pathology. Vikas Publishers, New Delhi.

Chaube, H.S. & Ramji Singh . Introductory Plant Pathology. International Book Distributing Co., Lucknow.

Gareth-Jones, D. Plant Pathology: Principles and Practice. Open University Press.

Horsfall J.G. & Cowling E. B. (Ed.). Plant Disease: An Advanced Treatise. Academic Press.

Lucas, J. A.. Plant Pathology and Plant pathogens. Blackwell.

Manners, J.G. Principles of Plant Pathology. Cambridge Univ Press.

Mehrotra, R.S. Plant Pathology. Tata Mc Graw Hill.

Pandey, B. P. Plant Pathology -pathogen and plant disease. S. Chand & Co.

Pathak, V.N., Khatri, N.K. & Pathak, M. Fundamentals of Plant Pathology. Agro-bios India.

Rangaswami, G. Diseases of Crop Plants of India. Prentice Hall India.

Tarr, S.A. J. The Principles of Plant Pathology. Winchester Press.

Wheeler, H. Plant Pathogenesis. Springer Verlag.

Wood, R.K.S. Physiological Plant Pathology. Blackwell

CT03. ANGIOSPERM ANATOMY, ANGIOSPERM EMBRYOLOGY, PALYNOLOGY & LAB TECHNIQUES
(2+2+1+1= 6 hours per week)

Angiosperm Anatomy

1. Cell wall and its development. Chemistry of cell wall- cellulose, hemicellulose, polysaccharides, cell wall proteins, water. Organisation of primary wall. Cytokinesis and growth. Plasmodesmata. Secondary wall chemical constituents- lignin, suberin, callose; organisation of secondary wall.
2. Node - nodal patterns: Unilacunar, trilacunar, multilacunar and split lateral. .Phylogenetic considerations. Leaf trace and branch trace- origin, departure; effect on stele and pith. Secondary growth in leaf traces.
3. Cambium: Development of vascular cambium and cork cambium in root and stem; cell types in vascular cambium, infected vascular cambium, seasonal variations in cambial activity; role of cambium in wound healing and grafting. Conversion of fusiform initials into ray initials; cambium in arborescent monocotyledons (Liliflorae).
4. Development and differentiation: The structure of specialized cells. Vascular differentiation (procambium, residual meristem, interfascicular and intrafascicular cambium); acropetal and basipetal differentiation in leaves, stem and roots. Sieve tube differentiation. Control of phloem differentiation. Tracheary elements differentiation. Ultra structure of phloem and xylem, brief account of transfer cells. Secondary wall thickening, cytoplasmic changes and autolysis. Control of differentiation. Genetic aspects- Induction of vessel elements. Induction of secondary xylem structure in relation to function in water conduction.
5. Anomalous secondary growth: Concepts; modification of the common type of vascular cambium, unequal activity of the vascular cambium. Successive cambia. Anomalous placement of vascular cambium. Discontinuous, unidirectional and bidirectional activity of cambium. Anomalous secondary growth in storage roots (Beet root, sweet potato).
6. Seedling anatomy: Concepts: anatomy of cotyledons, hypocotyl, seedling root, mesocotyl differentiation
7. Leaf anatomy: Unifacial, bifacial and centric leaf (onion); structure of epidermis, stomatal types; foriar sclerieds; oil cells; crystal idioblasts.
8. Anatomy in relation to taxonomy.
9. Wood anatomy- general account.

References

1. Easu, K. Plant Anatomy - Wiley Eastern Limited.
2. Fahn, A. Plant Anatomy. Pergamon Press.
3. Cutter, E.G. & Edward, E. Plant Anatomy : Experiment and Interpretations Part I and II.
4. Mauseth, J.D. Plant Anatomy - The Nenjamin Cumming Publishing Co.
5. Forester, A.S. Practical Plant Anatomy. D. Van Nostrand Company Inc.
6. Roberts, L.W. Cytodifferentiation in Plants - Cambridge University Press, Cambridge.

Angiosperm Embryology

1. Introduction to angiosperm embryology - structure of dithecos and monotheocos anther.
2. Microsporogenesis: Structure and function of wall layers, role of tapetum in pollen development
3. Male gametophyte: Pollen mitosis, division of generative cells, heterospority.
4. Megasporogenesis: Megaspore triad, dyad, coenomegaspore.
5. Embryo sac- different types- ultra-structure of components- synergid and antipodal. Theories of the morphological nature of embryo sac
6. Pollination -Artificial pollination - ultra-structural and dis-ultrastructural and histo-chemical sigma. Significance of pollen - pistil interaction. Role of pollen wall proteins and stigma. In vitro pollination and fertilization.
7. Fertilization: Role of synergids - filiform apparatus, heterospermy and triple fusion.
8. Structure and development of typical dicot and monocot embryos- structure and function of suspensor.
9. Endosperm: classification and type- ruminant endosperm- mosaic endosperm- endosperm haustoria- physiology and cytology of endosperm.
10. Polyembryony - classification – practical value.
11. Apomixis - general account, genetics of apomixis.
12. Parthenocarpy -seedless fruits
13. Experimental embryology-embryo culture, anther culture, ovule culture.
14. Embryology in relation to taxonomy.

References:

1. Bouman F. Ovule initiation, ovule development and seed coat structure in angiosperms. Today and Tomorrow Publishers, New Delhi.
2. Bhojwani S.S. and Bhatnagar S.S. The embryology of Angiosperms. Vikas Publication, New Delhi.
3. Davis C.L. Systematic embryology of Angiosperms. John Wiley.
4. Eames A.J. Morphology of Angiosperms. Mc Graw Hill.
5. Johanson D. Plant Embryology. Waltham, Massachusetts.
6. John B.D. (Ed.). Embryology of Angiosperms. Springer Verlag.
7. Maheswari P. An introduction to the Embryology of Angiosperms. Mc Graw Hill.
8. Raghavan V. Experimental embryogenesis in plants. Academic Press.
9. Wardlaw C.W. Embryogenesis in Plants. Methusen, London.

Palynology

1. Introduction- contributions of Erdtman and P K K Nair.
2. Development and structure of pollen wall. Pollen morphology and its application. Pollen evolution
3. Aero-palynology- methods of aerospore survey and analysis
4. Melittopalynology- nutritional and medical value of honey- unifloral and multifloral honey.
5. Recent advances in palynological studies- forensic-pollen allergy-oil exploration-paleopalynology.
6. Palynology in relation to taxonomy- euryalynous and stenopalynous taxa.

References:

1. Sripad N. Agashe. Palynology and its Application.
2. Kahinath Bhattacharya et. al. A Text Book of Palynology.

Laboratory Techniques

1. Study of the following instruments - their uses and principles:
 - a. Microscope: microscopic measurements - camera lucida, micrometry.
 - b. Microtomes- Sledge, Rocking, Rotary.
2. Killing, fixing and staining of plant tissues:
 - a. Important reagents and chemicals used in the preparation of fixatives and their properties.
 - b. Fixatives - FAA, Carnoy's fluid, chrome acetic, Nawaschins fluid, Craff, Flemings- composition, preparation and specific uses.
 - c. Dehydrating agents, clearing agents, mounting media. Examples and brief description.
 - d. Stains - classification, composition and specific uses - safranin, crystal violet, cotton blue, fast green, Orange - G, hematoxylin, carmine.
 - e. Brief account of vital staining.
 - f. Staining techniques - Double staining.
 - i. Saffranin - Fast green
 - ii. Crystal violet – Orange G
 - iii. Methods of embedding plant materials in paraffin wax - TBA method; embedding for Electron microscopy.
 - iv. Sectioning of embedded paraffin wax materials using Rotary Microtome.
 - v. Double staining of microtome serial sections embedding in paraffin wax - Saffranin - fast green; Crystal violet - Orange G / Erythrosin.
 - vi. Whole mounts - general account
 - vii. Maceration, smears
 - viii. Histochemical tests –
 - (1) PAS Test - insoluble polysaccharides.
 - (2) Sudan black -lipids
 - (3) Fuelgen reaction - Nucleic Acids.

References:

1. Peter Gray. Hand book of Basic microtechnique. Mcgraw – Hill.
2. John E. Sass. Botanical Microtechnique, Oxford & IBH Publishing Co.
3. John R. Baker. Principles of Biological Microtechnique –
4. A guide book to microscopical methods. A. V. Grimstone and R.J. Saker, Cambridge Univ. press.
5. K.V. Krishnamurthy. Methods in Plant Histochemistry.

Wong, C.H. Radiation Tracer Methodology in Biophysical Sciences. Prentice Hall.

Plummer, D. An introduction to Practical Biochemistry. Tata Mc Graw Hill, New Delhi.

CT07. CYTOGENETICS, GENETICS, BIOSTATISTICS, PLANT BREEDING AND EVOLUTION
(1+1.5+1.5+1+1= 6 hours)

Cytogenetics

1. Cytogenetics of aneuploids, euploids and structural heterozygotes: Effect of aneuploidy on phenotype. Transmission of monosomics and trisomics and their uses. Breeding behaviour and genetics of structural heterozygotes; translocation heterozygotes; Robertsonian translocation; B-A translocation. Karyotype- concepts and its importance. Structural chromosome aberrations- types and significance in evolution. Heteroploidy, aneuploidy, monosomy, trisomy (primary, secondary, tertiary and compensating). Nullisomy. Uses of aneuploidy in cytogenetics. Euploidy- autopolyploidy, allopolyploidy and segmental allopolyploid diploidization. Role of aneuploidy and euploidy in evolution.
2. Molecular cytogenetics: Multigenic families and their evolution; in situ hybridization- concept. Computer assisted chromosome analysis, chromosome micro-dissection and micro-cloning; flow cytometry.
3. Polytene and lampbrush chromosomes- cytogenetic importance.
4. Supernumerary chromosomes: B-chromosomes.

References

1. Alberts B., D. Bray, J. Lewis, K. Roberts and J.D. Watson. Molecular Biology of the Cell Garland Publishing Inc. New York.
2. Atherly A.G., J.R. Girton and J.F. McDonald. The Science of Genetics. Saunders College Publishing, Fort Worth, USA.
3. Burnharm C.R. Discussions in Cytogenetics. Burgess Publishing Co., Minnesota.
4. De Robertis E.D.P. and De Robertis E.M.F. Cell and Molecular Biology ISBN, Hong Kong.
5. Dupraw E.J. DNA and Chromosomes. Holt, Rinehart and Winston Inc. New York.
6. Hart D.L and E.W. Jones. Genetics: Principles and Analysis. Jones & Bartlett publishers, Massachusetts, USA.
7. Khush, G.S. Cytogenetics of Aneuploids. Academic Press.
8. Karp G. Cell and Molecular Biology: Concepts and Experiments. John Wiley & Sons, Inc. USA.
9. Lewin B. Gene. Oxford University Press, New York, USA.
10. Lewis R. Human Genetics: Concepts and Applications. WCB Mc Graw Hill, USA.
11. Malacinski G.M and D. Freifelder. Essentials of Molecular Biology. Jones and Bartlett Publishers Inc., London
12. Rieger R., A. Michaelis and M.M. Green Glossary of Genetics and Cytogenetics -Classical and Molecular. Springer-Verlag, New York.
13. Swanson C.P., T. Merz, and J.W. Young. Cytogenetics. Prentice Hall.

Genetics

1. Relevance of Mendelism in modern genetics. A critical evaluation of Mendelism on the basis of modern concept of genes.
2. Linkage and gene mapping. Three- point test cross; linkage map; interference; tetrad analysis and centromere mapping. Linkage in humans. Pedigree analysis. Genetic recombination and mapping of genes in bacteria and bacteriophages.
3. Mobile genetic elements: Transposable elements in bacteria. IS elements. Tn elements. Cmp site transposon. Cepia and P elements in Drosophila. Ac, DS and Mu elements in maize. Retrotransposons- Molecular characteristics and significance in development and evolution.
4. Extranuclear inheritance: Analysis of mitochondrial and chloroplast genomes and their utility. Cytoplasmic male sterility.
5. Quantitative genetics: Polygenic inheritance, heritability and its measurements. QTL mapping.
6. Population genetics: Systems of mating. The Hardy-Weinberg principle. Estimation of gene frequencies. Factors affecting equilibrium: natural selection, mutation, migration and genetic drift.
7. Human genetics: Human pedigree analysis, Lod score for linkage testing. Karyotype; genetic disorders.

References:

- Snustad, Simmons and Jenkins. Principles of Genetics. John Willey and Sons.
Weaver and Hendrick. Genetics. Wm. C Brown Publishers.
Goodenough. Genetics. Saunders College Publishing.

Stansfield. Theory and Problems of Genetics. Mc Grow Hills.
Strickberger. Genetics. Macmillan.
Burnet L. Essential Genetics. Cambridge University Press.
Friefelder. Microbial Genetics. Narosa Publishing House.
Gardner, Simmons and Snustad. Principles of Genetics. John Wiley and Sons, New York, USA.
Singh B.D. Fundamental of Genetics. Kalyani Publishers, New Delhi.

Biostatistics

1. The science of statistics and its applications in biological research.
2. Types and collection of data- Census and sampling- theory and methods.
3. Tabulation and presentation of data- diagrammatic and graphic presentation.
4. Analysis of data- central tendencies.
5. Measures of dispersion - Range, quartile deviation, mean deviation, standard deviation and standard error. Relative measures of dispersion - coefficient of variation.
6. Tests of significance- formulation and testing of hypothesis- testing the probability of committing type 1 and type 2 errors. z test, t test, chi-square test.
7. Analysis of variance- one way classification and two way classification, F test, F value calculation, F table.
8. Correlation and Regression analysis- coefficient of correlation- significance testing. Rank correlation. Lines of regression- coefficient of regression.
9. Experimental designs- designing an experiment- CRD, RBD, LSD. Factorial experiments.
10. Probability- application of the principles of probability- theorems of probability- applications- Probability distributions- binomial, multinomial, normal and poisson distributions.
11. Statistical softwares- SPSS, SPAR, MINITAB.

References:

1. Chandal S.R.S. A Handbook of Agricultural Statistics. Achal Prakashan Mandir, Kanpur, India.
2. Das M.N. and N.C. Giri. Designs and Analysis of Experiments. Wiley Eastern Ltd.
3. Elhance and Elhance. Fundamentals of Mathematical Statistics. Kithab Mahal, New Delhi, India.
4. Gupta S.K and V.K. Kapoor. Fundamentals of Mathematical Statistics. Sultan Chand & Sons, New Delhi.
5. Gupta C.B. An Introduction to Statistical Methods. Vikas Publishing House Pvt. Ltd.
6. Kempthorne, O. An introduction to Genetic statistics. John Wiley and Sons Inc. New York.
7. Mather K. and J.L. Links. Biometrical Genetics. Chapman and Hall, London.
8. Panse, V.G and P.. Sukatme. Statistical Methods for Agricultural Workers. ICAR, New Delhi.
9. Rao C.A. Advanced Statistical Methods in Biometrical Research. Wiley and Sons, New York.
10. Singh P. and S.S. Narayanan. Biometrical Techniques in Plant Breeding. Kalyani Publishers, New Delhi.
11. Singh R.K. and Chaudhary B.D. Biometrical Methods in Quantitative Genetic Analysis. Kalyani Publishers, New Delhi.
12. Daniel W.W. Biostatistics- A foundation for Analysis in Health Sciences.

Plant Breeding

1. Introduction and objectives.
2. Organizations involved in plant breeding.
3. Breeding systems in sexually propagated plants- Floral Biology and its significance in plant breeding. Sterility and incompatibility systems.
4. Genetic resources- centers of crop genetic diversity. In situ and ex situ conservation; cryopreservation of germplasm.
5. Conventional methods of plant breeding:
Domestication of wild plants- changes under domestication.
Plant introduction- history, types, principles, plant introduction agencies in India- rules and regulations. Major achievements.
Selection- selection methods in sexually and vegetatively propagated species. Selection in segregating populations. Major achievements.
Hybridization- history, objectives, techniques, consequences and major achievements.
Heterosis breeding- genetic basis of heterosis and inbreeding depression.
6. Modern methods of plant breeding:
Mutation breeding- history, methodology, applications, merits, demerits and achievements.

Polyploidy breeding- methodology, applications, merits, demerits and achievements.

Biotechnological approaches in plant breeding- Molecular markers and their uses- Transgenic plants- critical evaluation.

7. Breeding for special purposes: Resistance breeding- a brief account of disease resistance, pest resistance, stress resistance- achievements. Quality breeding- objectives and achievements.

8. Biometrical techniques in Plant Breeding- analysis of variability, heritability, genetic advance and combining ability.

9. IPR- Protection of plant variety and farmers' right act.

References

1. Allard R.W. Principles of Plant Breeding. John Wiley and Sons, New Delhi.
2. Chahal G.S. and Gosal S.S. Principles and Procedure of Plant Breeding. Narosa Publishing House, New Delhi.
3. Jain H.K. and Kharkwal M.C. Plant Breeding- Mendelian to Molecular Approaches. Narosa Publishing House, New Delhi.
4. Roy D. Plant Breeding- Analysis and Exploitation of Variation. Narosa Publishing House.
5. Hayward M.D., Bosemark N.O. and Romagosa I. Plant Breeding- Principles and Prospects. Chapman & Hall.
6. Gupta S.K. Plant Breeding- Theory and Techniques. Agrobios (India), Jodhpur.
7. Khan M.A. Plant Breeding. Biotech Books, New Delhi.
8. Stoskopf N.C. Plant Breeding- Theory and Practice. Scientific Publishers (India), Jodhpur.
9. Sharma J.R. Principles and Practices of Plant Breeding. Tata Mc Graw Hill.
10. Chopra V.L. Breeding Field Crops. Oxford & IBH.
11. Mohanan K.V. Essentials of Plant Breeding. PHI Ltd., New Delhi.
12. Mohanan K.V. Essentials of Plantation Science. Penta Book Publishers, Calicut, Kerala.

Evolution

1. The concept of evolution- evidences of evolution- geological time scale and evolution.
2. Origin of life- theories and experimental evidences.- chemical evolution and biological evolution.
3. Evidences of evolution.
4. Theories of evolution.- Pre-Darwinian, Darwinian and Post Darwinian theories.- Modern synthetic theory of evolution.
5. Reproductive isolation and the origin of species.
6. Evolution at the molecular level.

CT08. PLANT ECOLOGY, CONSERVATION BIOLOGY, PHYTOGEOGRAPHY AND FOREST BOTANY
(2.5+1.5+1+1= 6 hours)

Plant Ecology & Conservation Biology

1. Habitat Ecology: Salient features of terrestrial (Biomes), fresh water (Limnology), wet land and marine habitats.
2. Productivity and Energy flow: Concepts, limits and process of primary production; methods of productivity measurements: global trends in primary productivity, energy flow models.
3. Population characteristics: density, natality, mortality, distribution, biotic potential, carrying capacity, aggregation and dispersal, ecotone and edge effect.
4. The environment and its pollution- types (land, air and water). Effect on living organisms. Control with emphasis on biological methods. Environmental hazards.
5. Threats to the global environment- green house effect, ozone depletion, El-Nino and La Nina effects.
6. Environment impact assessment (EIA) and assessment of environmental hazards- remote sensing.
7. Problems of conservation; causes of threat to environment- human interference, deforestation, habitat destruction, overexploitation of resources.
8. Identification of threatened plants; red list categories- extinct, endangered, vulnerable, rare and out of danger. Extinction process. Hot spots, keystone species and flagship species.
9. Strategies for conservation: in situ and ex situ conservation, biosphere reserve, national parks, wildlife sanctuaries. Gene banks, cryopreservation, seed banks.
10. Afforestation- social forestry, agroforestry. International biological programme (IBP), Man and biosphere programme (MAB), IUCN, world environment day, wild life preservation act (1972), Indian forest (conservation) act (1980) and United Nations Environment Programme. Environment Protection Acts.
11. Environmental awareness- role of government and NGOs.-Gaia hypothesis

12. Biodiversity- significance at Local, National and Global levels. Deep ecology (Paradigm shift from anthropocentric ecology to ecocentric ecology. National heritages.

References:

1. Negi, S.S. Hand book of National Parks and Sanctuaries in India.
2. M.P. Nair and P.K Sastry - Red data book of Indian plants.
3. Mehrotra and B.K Suri - Remote sensing for environment and forest management.
4. Negi S.S - Biosphere reserves in India.
5. Lucas and Syngé - IUCN Red data book. IUCN, Stockholm
6. Dasman R.F - Environmental Conservation.
7. Odum E.P. Fundamentals of ecology
8. Odum E.P. Basic principles of ecology
9. Misra K.R. Ecology workbook.
10. Puri G.S. - Indian Forest Ecology Volumes I and II. Oxford & IBH.
11. Clarke G.L - Elements of Ecology.
12. Chhatwal G.L. Encyclopedia of environmental biology.
13. Ray P.K. - Pollution and Health. Willey-Eastern Ltd, New Delhi.
14. Michael P.- Ecological methods for field and laboratory investigations. Tata McGraw Hill, New Delhi.
15. Kershaw K.A. Quantitative and Dynamic Plant Ecology. ELBS.

Phytogeography

1. Patterns of plant distribution: continuous distribution: circumpolar, circumboreal, circum austral, pan tropical.
2. Discontinuous distribution: Theory of land bridges, theory of continental drift, theory of glaciation.
3. Endemic distribution (neoendemic, paleoendemic), age and area hypothesis.
4. Phytochoria of world and India.

References:

1. Ronald Good. The geography of flowering plants. Lcngmans.
2. Bharucha F.R. A text book of plant geography of India. Oxford University Press.
3. Puri G.S. Indian Forest Ecology, Vol I, II. Oxford, New-Delhi.

Forest Botany

1. Forest- Definitions. Study of various types of forests in the world and in India.
2. Forest products-Major and minor with special reference to Kerala.
3. Influence of forests on environment. Consequence of deforestation and industrialization- sustainable utilization of bioresources.

References

1. Agarwal A.P. Forests in India. Oxford & IBH.
2. Gregorv G.R. Forest products, production, trade and consumption, quantity and value of raw materials requirements. Ford foundation, New-Delhi.
3. Puri G.S. Indian Forest Ecology Vol. I& II. Oxford & IBH.
4. Champion G.H. and Seth S.K. A revised survey of the forest types of India.

CP09. PRACTICALS OF CELL BIOLOGY, MOLECULAR BIOLOGY, BIOPHYSICS, CYTOGENETICS, (0.5 + 1+ 0.5+1= 3 hours)

Cell Biology

1. Study of Mitosis in root tip cells.
2. Pre-treatment of root tips with colchicine /hydroxy quinoline /paradichlorobenzene and study of chromosomes in Chlorophytum, / Zea mays/ Crotalaria/ Cyanotis.
3. Isolation of plastids and mitochondria.
4. Chromosome banding

Molecular Biology

1. Working out problems from molecular genetics.
2. Isolation of nucleic acid and identification of histones by SDS-PAGE.

3. Project work may be done by a group of students (5 to 7 members) and a Teacher in the department is to supervise the work throughout the 5th and 6th semester.
 4. Basic methods of social research discussed in the Semester 4 (SO4 B05: Social Research Methods) and in Semester 5 (SO5 B10: Research Methods and Social Statistics) should be applied for project work.
 5. Project work should be based on either primary or secondary sources of data.
 6. The project work report may contain the following items
 - a) Introduction
 - b) Methodology
 - c) Analysis
 - d) Conclusions
 - e) Bibliography
 - f) Appendix, if any
- A declaration of students and certificate of the supervising teacher should be included in the report.
7. Project Work Report may be in typed form in 30 to 40 pages (English: Times New Roman, 12 point font, Malayalam: 12 point font; 1.5 space). Report should be spiral bound and three copies of the same are to be submitted.
 8. Report presentation is to be made in an open meeting by the whole group. No Member shall be exempted from the presentation. Participation of each member will be considered in the process of evaluation. All the members will be awarded with the same grade for the presentation. Viva-voce will be conducted individually and individual grades will be awarded. The grade of the student for project work will be the average of the common grade for presentation (75%) and individual grade for Viva-voce (25%).

CORE COURSE

SOC6 B.11 ENVIRONMENT AND SOCIETY

No. of Credits: 4

Objectives

1. To provide basic knowledge of environmental sociology
2. To make the students aware of the various environmental issues

MODULE I ENVIRONMENTAL SOCIOLOGY

- I.1. Emergence and development of environmental Sociology
- I.2. Scope, Importance Need for Public awareness, Multidisciplinary nature of environmental studies .

MODULE II THEORETICAL FOUNDATIONS

- II.1. Views of Emile Durkheim, Max Weber, Karl Marx, Parsons , Anthony Giddens.

MODULE III ENVIRONMENTAL ISSUES

- III. 1. Issues pertaining to water, air, soil, solid waste, sanitation, Technological waste, Importing and Exporting of waste
- III. 2. The role of Multi Nationals, Global warming, Climate Change

MODULE IV ENVIRONMENT AND DEVELOPMENT

- IV.1. Deforestation, Construction of dams , Extinction of species
- IV.2. Exploitation of natural resources and Bio diversity conservation

References

Benny Joseph- Environmental studies

Shardha Singh & Manisha Shukla- Environmental studies

Sukant K Chaudhary- Culture, Environment and Sustainable Development

Robe White-Controversies in Environmental Sociology

Redcliff and Benton- Social Theory and Global Environment

Ramachandra Guha-Social Ecology

UNIVERSITY OF CALICUT
M.Sc. CHEMISTRY (CSS PATTERN) - SEMESTER IV

CH4EO6 - NATURAL PRODUCTS & POLYMER CHEMISTRY (4 Credits, 72 hrs)

UNIT 1: Basic aspects of Natural Products (9 hrs)

Classification of Natural Products: Classification of Natural products based on chemical structure, physiological activity, taxonomy and Biogenesis. Carbohydrates, Terpenoids, Carotenoids, alkaloids, steroids, anthocyanins etc. Methods of isolation of each class of compound

Essential Oils: Isolation and study of important constituents of lemon grass oil, citronella oil, cinnamon oil, palmarosa oil, turpentine oil, clove oil, sandalwood oil, Essential oils of turmeric and ginger. Oleoresins of pepper, chilly, ginger and turmeric. Aromatherapy.

UNIT 2: Terpenoids and Steroids (9 hrs)

Terpenoids: classification, structure elucidation and synthesis of abietic acid.

Steroids : Classification, structure of cholesterol, conversion of cholesterol to progesterone, androsterone and testosterone. Classification, structure and synthesis of prostaglandins, biosynthesis of fatty acids, prostaglandins, terpenoids and steroids.

Steroids: Classification and structure elucidation of Cholesterol, Ergosterol, Oosterone, Androsterone, Testosterone, Progesterone, Cortisone and Corticosterone.

UNIT 3: Alkaloids and Anthocyanins (9 hrs)

Alkaloids – classification of alkaloids, structure elucidation based on degradative reactions (quinine and atropine). Biosynthesis of quinine and papaverine.

Anthocyanins: Introduction, General Nature and Structure of Anthocyanidins. Flavone, Flavonol, Isoflavone and Chalcone

UNIT 4: Dyes, Pigments and Supramolecules (9 hrs)

Brief introduction to dyes and pigments (natural and synthetic): β -carotene, indigo, cyclic tetrapyrroles (porphyrins, chlorins, chlorophyll, heme), study of phthalocyanines, squarenes, cyanine dyes

Introduction to Supramolecular chemistry and Molecular Recognition

References:

1. M. B. Smith, *Organic Synthesis*, 3/e, Academic Press, 2011.

2. F. A. Carey and R. J. Sundberg: *Advanced Organic Chemistry (part B)*, 3rd ed., Plenum Press.
3. T.W. G. Solomons: *Fundamentals of Organic Chemistry*, 5th ed., John Wiley
4. H. O. House: *Modern Synthetic Reactions*, W. A. Benjamin
5. W. Carruthers: *Some Modern Methods of Organic Synthesis*, 4/e, Cambridge University Press.
6. I. L. Finar: *Organic Chemistry* Volumes 1 (6th ed.) and 2 (5th ed.), Pearson.
7. J. Clayden, N. Green, S. Warren and P. Wothers: *Organic Chemistry*, 2/e, Oxford University Press
8. N. R. Krishnaswamy: *Chemistry of Natural Products; A Unified Approach*, Universities Press
9. R. J. Simmonds: *Chemistry of Biomolecules: An Introduction*, RSC
10. R. O. C. Norman: *Principles of Organic Synthesis*, 3rd ed., CRC Press, 1998.
11. J. M. Lehn, *Supramolecular Chemistry*

UNIT 5: Polymerization Processes (9 hrs)

Polymerization processes. Free radical addition polymerization. Kinetics and mechanism. Chain transfer. Mayo-walling equation of the steady state. Molecular weight distribution and molecular weight control. Radical Atom Transfer and Fragmentation – Addition mechanism. Free radical living polymers. Cationic and anionic polymerization. Kinetics and mechanism, Polymerization without termination. Living polymers. Step Growth polymerization. Kinetics and mechanism. Molecular weight distribution. Linear Vs cyclic polymerization, other modes of polymerization. Group Transfer, metathesis and ring opening polymerization. Copolymerization. The copolymerization equation, Q-e scheme, Gelation and Crosslinking. Copolymer composition drift Polymerization techniques. Bulk Solution, melt, suspension, emulsion and dispersion techniques

UNIT 6: Characterization and Stereochemistry of Polymers (9 hrs)

Polymer Stereochemistry. Organizational features of polymer chains. Configuration and conformation, Tacticity, Repeating units with more than one asymmetric center. Chiral polymers – main chain and side chain. Stereoregular polymers. Manipulation of polymerization processes. Zeigler-Natta and Kaminsky routes. Coordination polymerization. Metallocene and Metal oxide catalysts.

Polymer Characterization. Molecular weights. Concept of average molecular weights, Molecular weight distribution. Methods for determining molecular weights. Static and dynamic methods, Light scattering and GPC. Crystalline and amorphous states. Glassy and Rubbery States. Glass transition and crystalline melting. Spherulites and Lammellac. Degree of Crystallinity, X-ray diffraction,

UNIT 7: Polymer Solutions, Industrial polymers and Copolymers (9 hrs)

Polymer Solutions. Treatment of dilute solution data. Thermodynamics. Flory-Huggins equation. Chain dimension-chain stiffness – End-to-end distance. Conformation-random coil, Solvation and Swelling. Flory-Reiner equation. Determination of degree of crosslinking and molecular weight between crosslinks.

Industrial polymers. Synthesis, Structure and applications. Polyethylene, polypropylene, polystyrene. Homo and Copolymers. Diene rubbers. Vinyl and acrylic polymers. PVC, PVA, PAN, PA. PMMA and related polymers.

Copolymers. EVA polymers. Fluorine containing polymers. Polyacetals. Reaction polymers. Polyamides, polyesters. Epoxides, polyurethanes, polycarbonates, phenolics, PEEK, Silicone polymers.

UNIT 8: Speciality Polymers (9 hrs)

Reactions of polymers. Polymers as aids in Organic Synthesis. Polymeric Reagents, Catalysts, Substrates, Liquid Crystalline polymers. Main chain and side chain liquid crystalline polymers. Phase morphology. Conducting polymers. Polymers with high bandwidth. Polyanilines, polypyrrols, polythiophenes, poly(vinylene phenylene). Photoresponsive and photorefractive polymers. Polymers in optical lithography. Polymer photoresists. Electrical properties of Polymers, Polymers with NLO properties, second and third harmonic generation, wave guide devices.

References:

1. F.W. Billmeyer. *Textbook of Polymer Science*. 3rd Edn, Wiley. N.Y. 1991.
2. G. Odian, *Principles of Polymerisation*, 4/e, Wiley, 2004.
3. V.R. Gowriker and Others, *Polymer Science*, Wiley Eastern Ltd.
4. J.M.G Cowie. *Polymers: Physics and Chemistry of Modern Materials*. Blackie. London, 1992.
5. R.J.Young, *Principles of Polymer Science*, 3rd Edn. , Chapman and Hall. N.Y. 1991.
6. P.J. Flory. *A Text Book of Polymer Science*. Cornell University Press. Ithacka, 1953.
7. F. Ullrich, *Industrial Polymers*, Kluwer, N.Y. 1993.
8. H.G.Elias, *Macromolecules*, Vol. I & II, Academic, N.Y. 1991.

UNIVERSITY OF CALICUT
M.Sc. CHEMISTRY (CSS PATTERN) - SEMESTER IV

CH4EO7 - MATERIAL SCIENCE (ELECTIVE) (4 credits, 72hrs)

Unit 1: Introduction to Material Science (9hrs)

Introduction, classification of materials, functional classification, classification based on structure, environmental and other effects, material design and selection;

Mechanical properties – significance and terminology, the tensile test, true stress and true strain, bend test, hardness of materials.

Unit 2: Ceramic Materials (9hrs)

Definition of ceramics, traditional and new ceramics, structure of ceramics, atomic interactions and types of bonds, phase equilibria in ceramic systems, one component and multi component systems, use of phase diagrams in predicting material behaviour, electrical, magnetic, and optical properties of ceramic materials.

Unit 3: Nanomaterials and Nanotechnology (9hrs)

Nanomaterials, nanostructures, self-assembly, Nanoparticles- methods of synthesis, sol-gel process, hydrolysis of salts and alkoxides, precipitation, condensation reactions, electrokinetic potential and peptization reactions; Gelatin network- xerogels, aerogels, drying of gels; Chemical modifications of nanosurfaces, applications of sol-gel process, sol-gel coating, porous solids, catalysts, dispersions and powders

Unit 4: Materials for Special Purposes – I (9hrs)

Production of ultra pure materials - zone refining, vacuum distillation and electro refining; Ferroelectric and piezoelectric materials - general properties, classification of ferroelectric materials, theory of ferroelectricity, ferroelectric domains, applications, piezoelectric materials and applications; Metallic glasses - preparation, properties and applications.

Unit 5: Materials for Special Purposes – II (9hrs)

Magnetic materials, ferri and ferro magnetism, metallic magnets, soft, hard & superconducting magnets; Ceramic magnets, low conducting and superconducting magnets; Superconducting materials - metallic and ceramic superconducting materials, theories of superconductivity,

Vides, *Integrative Approach to Molecular Biology*, MIT Press
Vides, *Gene Regulation and Metabolism*, MIT Press
Potchard, *Medical Genetics at a Glance*, Blackwell
Jan Vijg, *Aging of the Genome*, Oxford University Press
Frank H. Stephenson, *Calculations for Molecular Biology and Biotechnology: A guide to Mathematics in the Laboratory*, Academic Press, Elsevier

References:Bioinformatics

Atwood and Parry-Smith. 2001. Introduction to Bioinformatics. Pearson Education Asia, New Delhi.

Baxevanis & Ouellette. 2001. Bioinformatics - A practical guide to the Analysis of Gdnes and Proteins, Wiley, New York.

Mount, 2001. Bioinformatics: Sequence and Genome Analysis. Cold Sprint Harbour laboratory Press, New York.

S.C. Rastogi, Mendiratta, P. Rastogi. 2005. Bioinformatics: Method & Applications. Genomics, Proteomics & Drug Discovery. Prentice Hall of India, New Delhi.

Mani & Vijayaraj. 2004. Bioinformatics: A Practical Approach. Aparna Publications, India.

Higgins and Taylor. 2000. Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, Oxford.

Jin Xiong. 2006. Essential Bioinformatics. Cambridge University Press, India Pvt. Ltd.

Rex A. Dwyer - Genomic Peril - From Bioinformatics Basics to Working Code (with CD) - Cambridge University Press.

Atwood and Parry-Smith. 2001. Introduction to Bioinformatics. Pearson Education Asia, New Delhi.

www.fgcuedu/supp

SIXTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)

ZOOLOGY Core Course XIII

Code: ZO6B 13 T

REPRODUCTIVE BIOLOGY, DEVELOPMENTAL BIOLOGY AND TERATOLOGY

(54 Hours) (3 hours per week, 3 credits)

Section A: REPRODUCTIVE BIOLOGY (14 hrs)

1. Introduction

(1 hr)

Scope, reproductive strategies in invertebrates and vertebrates: semiparity and iteroparity, sexpatterns: unisexual, reversal of sex, examples.

2. Reproductive system in human beings

(3 hrs)

Male reproductive system: Structure of testis, Semen production and composition, Ejaculation; Female reproductive system: Structure ovary and

Graafian follicle, ovulation, mention corpus haemorrhagicum, corpus luteum and corpus albicans; Accessory reproductive organs ; secondary sexual characteristics. Gametogenesis male and female

3. Pregnancy, Gestation, Placentation, parturition and lactation (2 hrs)

4. Reproductive cycles in Mammals (2 hrs)

Oestrous and menstrual cycles and their hormonal control

5. Reproductive technologies (1 hr)

Infertility and its management: Brief account of semen collection, preservation, storage, artificial insemination, surrogacy.

6. Cryopreservation and embryo transfer (1 hr)

Collection, care and preservation of embryos; *In vitro* fertilization and embryo transfer : major steps; Test tube babies

7. Assisted Reproductive Techniques (ART) (1hr)

GIFT, ZIFT, ICSI, oocyte donation and embryo donation

8. Prenatal Diagnosis (1 hr)

Different methods (invasive and non invasive). Female foeticide: ethical issues and law. (Mention Prenatal Diagnostic techniques – Prevention of misuse act – PNDT Act

9. Fertility Control (2 hr)

Natural methods, Artificial methods, chemical methods, hormonal methods, surgical contraception, removal of gonads and uterus , abortion.

Section B: DEVELOPMENTAL BIOLOGY (37hrs)

1. Introduction (1 hr)

Historical Perspective, Theories of Preformation, Epigenesis, Recapitulation and Germplasm, Determinate and Indeterminate types of development, Germ layers and Derivatives.

2. Types of eggs (2 hrs)

Classification of eggs based on: the amount of yolk (micro, meso & macrolecithal), the distribution (iso, centro & telo lecithal), presence or absence of shell (cleidoic & non cleidoic), the development (determinate & indeterminate) with examples; egg membranes (primary, secondary and tertiary)

3. Cleavage and cell lineage (3 hrs)

Types of cleavage with examples: based on planes (Meridional, Vertical, Equatorial and Latitudinal); based on amount of yolk (Holoblastic & Meroblastic); based on development (Determinate & Indeterminate); based on Pattern (Radial & Spiral); Cell lineage studies in Planocera; Different types of blastulae.

4. Early development of Amphioxus (3 hrs)
Cleavage, Blastulation, Gastrulation & Neurulation.

5. Development of Frog (8 hrs)
Fertilization, Cleavage, Blastulation & fate map, Gastrulation (Morphogenetic movements) and formation of germ layers, neurulation & notochord formation, mesoderm and coelom formation; organogeny of brain and eye; hormonal control of amphibian metamorphosis.

6. Development of Chick (7 hrs)
Fertilization, Structure of egg; cleavage, blastulation, gastrulation and formation of germ layers; Salient features of chick embryo at primitive streak stage, 24 & 33, 48 hours stage; Development and functions of extra embryonic membranes.

7. Development of Man (3 hrs)
Cleavage and formation of morula, development of blastocyst, implantation, gastrulation up to the formation of germ layers.

8. Cell Differentiation and Gene action during development (4 hrs)
Cell differentiation, totipotency, pluripotency, Dedifferentiation and Redifferentiation; controlled gene expression during development, Homeotic genes, Mention Hoxgenes; Stem cells, their significance and applications .

9. Parthenogenesis (2 hrs)
Definition, Types: i). Natural parthenogenesis: Arrhenotoky, Thelytoky, Obligatory and Facultative, ii). Artificial parthenogenesis, and significance

10. Experimental Embryology (4 hrs)
Construction of fate map, Vital staining, Marking with carbon particles & radio active tracing; Spemann's constriction experiments on amphibian embryos (Potency of nuclei and grey crescent), Importance of Grey crescent; Organizers in amphibian development (primary, secondary & tertiary organizers); Gradient experiments in sea urchin eggs).

Section C: TERATOLOGY (3 hrs)

Environmental disruption of animal development (alcohol, drugs, Nicotine and chemicals- brief account) [Refer Developmental Biology, Scott F.Gilbert].

Topics for Seminar / Assignment/Discussion

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Placenta: different types and functions
2. Development of foetal membranes in man.
3. Regeneration in animals.
4. Factors affecting regeneration
5. Factors inducing parthenogenesis.
6. Structure of different types of eggs (amphioxus, frog, insect)
7. Corpus luteum, corpus albicans and corpus haemorrhagicum

References

- Agarwal, P., *Chordate Embryology and Histology*, 1e, 2001, Krishna Prakashan
- Balinsky, B.I. *Embryology*, Saunders & Topan
- Bejley, D.J. *et al.*, *Human Reproduction & Developmental Biology*, 1980, McMillan
- Berril, N.J. & Karp, G. *Development* TMH.
- Gilbert, S.C., *Developmental Biology*, 5e, Sinauer Associates.
- Jayaprakash, M. *A Manual of Developmental Biology*, 2e, Academia, Trivandrum.
- Patten, B.M.: *Early Embryology of the Chick*, 1973, TMH.
- Patten, B.M.: *Foundations of Embryology*, 1958, McGraw Hill.
- Rugh, R.: *Frog Reproduction and Development*.
- Sastry & Shukal: *Developmental Biology*, 2003, 1e, Rastogi Pub.
- Scott, F., Gilbert: *Developmental Biology* – Sinaur Associates.
- Verma, P.S. & Agarwal V.K.: *Chordate Embryology*.
- Vijayakumaran Nair, K. & George P.V. *A Manual of Developmental Biology*, 3e, 2002.
- Wolpert, L.: *Principles of Development*, 1994, OUP.
- Muller, *Developmental Biology*, Springer Publishers.

SYLLABUS
OPEN COURSES
ZO5 D 01 , 02 & 03
FIFTH SEMESTER B. Sc. DEGREE PROGRAMME(Theory)
ZOOLOGY OPEN COURSE- I
Code: ZO5-D 01
REPRODUCTIVE HEALTH AND SEX EDUCATION
(36 hours) (2 hours per week) (2 credits)

1.Introduction

(1 hrs)

Reproductive rights, Need for sex education

2.Sex determination and Chromosomal anomalies

(5hrs)

Chromosomal mechanism of sex determination, Environmental control of sex determination, Hormonal control of sex determination, Barr body, Twin studies, Sex reversal, Sex chromosomal anomalies:Turner's syndrome and Klinefilter's syndrome.

3.Sexualabuses and myths

(4hrs)

Premarital and extramarital sex, Sexual abuse and rape, Sexual perversions, Alternate orientations (Homosexuality, Lesbianism, Bisexuality Paraphilias), Oral sex, Animal sex, Cyber sex, Child abuse, Prostitution, Sexual myths, Sexual hygiene.

4.Prenatal Diagnosis

(3hrs)

Different methods (invasive and non invasive). Female foeticide: Ethical issues and laws. (Mention Prenatal Diagnostic techniques – Prevention of misuse act – PNDT Act)

5.FertilityControl

(4 hrs)

Natural methods, Artificial methods, Contraceptive devices and medications, Abortion, Legal termination of pregnancy, Vasectomy, Tubectomy, Vaccines and hormones in fertility control.

6.Infertility and assisted reproductive technologic

(5hrs)

Physiological infertility, pathological infertility, causes and problems in male and female infertility. Assisted Reproductive Technologies (ART) – IVF, ET, AI, GIFT, ZIFT, ICSI, Embryo or oocyte donation, health hazards in ART, cryopreservation of blastocysts and ethics, designer baby and ethics.

7.Sexually transmitted infectious diseases

(6hrs)

Symptoms, mode of transmission, diagnosis, treatment and prophylaxis of AIDS, Syphilis, Gonorrhoea, Herpes (genital), human papilloma virus and genital warts, hepatitis, gonococcal vulvo vaginitis, Trichomonal vaginitis.

Mention the term venereal disease. Socio economic dimensions of STD.

8. Ethical aspects of sex

(2 hrs)

Introduction, Healthy relationship with opposite sex, Role of counseling, Gender discrimination in family and society, Sperm bank, Ovum bank,

9. Common diagnostic techniques

(6 hrs)

Imaging techniques and purpose of imaging – Angiography, CT scanning, MRI, PET, and Ultra sound scanning.

Techniques to monitor body vital functions – EEG, ECG, LFT.

Laboratory diagnostic methods – ELISA, WESTERN BLOT.

Therapeutic methods – Endoscopies, Laser microscopy, haemodialysis, bypass surgery, angioplasty.

. Topics for Assignments and Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Sexual counseling
2. Marriage counseling
3. Population explosion and birth control
4. Functions of male and female hormones
5. Hormones of pregnancy

References

1. Prakash Kothari : *Common sexual problems and solutions*, UBS Publishers and Distributors Ltd.
2. Kinsey, sex and fraud, Judith, Edward W. Eichel, John H. Court and J. Gordon, Editors Lochinvar : Huntington House Publications.
3. Lynn L. Long, Judith A. Burnett, R. Valorie Thomas: *Sexuality counseling An integrated approach* , Pearson, Merrill Prentice Hall.
4. Robert T. Francoeur: *Becoming a sexual person*, John Wiley and Sons.
5. Guyton & Hall: *Textbook of Medical Physiology*
6. Churchill Livingstone : *Davidson's Principles and Practice of Medicine*.
7. Vander, Sherman and Luciano : *Human Physiology*, McGraw Hill.
8. Vijayakumaran Nair, K.and Paul, P.I: *Animal Physiology and Biochemistry*,

SEMESTER II**CORE COURSE****NO. OF CREDITS: 5****SOC2 C08 GENDER STUDIES****Objectives**

- To introduce the basic concepts of Gender Studies
- To familiarize the theoretical perspectives on Gender
- To discuss the Gender dynamics in Indian society
- To discuss Gender relations in the context of Kerala society

MODULE 1 GENDER AS A SOCIAL CONSTRUCT

Gender Studies: Genesis ,Women’s studies/gender studies
 Basic Concepts - Sex/Gender, Gender identity, Gender Stereotypes, Gender Discrimination,
 Gendered division of labour , Heteronormativity, LGBTIQ
 Different waves of Feminism, Feminist Perspectives - Liberal,
 Radical, Marxist, Socialist, Eco-feminism

MODULE 2 PERSPECTIVES ON GENDER

- 2.1 Nancy Chodorow, Ann Oakley, Simone de Beauvoir
- 2.2 Judith Butler, Julia Kristeva,
- 2.3 Queer theory, Queer politics
- 2.4 Theories of masculinity: Sherry.B.Ottner, R.W. Connel

MODULE 3 GENDER DYNAMICS IN INDIA

- 3.1 Social institutions and Gender reproduction- Caste, Class, Religion
- 3.2 Gender and economy:, property relations, gender wage-gap, unpaid labour and glass ceilings
- 3.3 Representations of Gender: Objectification and stereotyping , Gendered Violence
- 3.4 Issues of sexual minorities in India

MODULE 4 GENDER AND KERALA SOCIETY

- 4.1 The making of the ideal Malayalee Woman- J.Devika kulasthreyum Chandappennum
- 4.2 Politics, women, and well-being: How Kerala became a model- Robin Jeffrey
- 4.3 Scripting Lives: Narratives of ‘Dominant Women’ in Kerala- Sharmila Sreekumar
- 4.4 Hierarchies of masculine performance FRIENDSHIP AND FLIRTING: MICRO-POLITICS IN KERALA, SOUTH INDIA CAROLINE OSELLA & FILIPPO OSELLA

Reference

- Desai, Neera & M. Krishnaraj
Dube, Leela et.al. (ed)
- Sharma, Ursula
- Shulamitz, Reinhartz & Lynn Davidman
Chanana, Karuna
- Dube, Leela
- Gandhi, N. & N.Shah
- George Ritzer
David Boucheir
Ann Oakley
Haralambos, Michael
J.Devika
Robin Jeffrey
Sharmila Sreekumar
- Caroline Osella & Filippo Osella
- Women and Society in India
 - Visibility and Power: Essays on Women in Society and Development
 - Women, Work and Property in North-West India
 - Feminist Research Methods
 - Socialization, Women and Education: Explorations in Gender Identity
 - Women and Kinship: Comparative Perspectives on Gender in South and South-East Asia
 - The Issues at Stake: Theory and Practice in the Contemporary Women's Movement in India
 - Sociological Theory
 - The Feminist Challenge
 - Sex Gender And Society
 - Sociology-Themes and Perspectives
 - Kulasthreeyum Chandappennum
 - How Kerala became a model
 - Narratives of 'Dominant Women' in Kerala
 - Friendship and Flirting: Micro-Politics in Kerala, South India

HIS6B14 GENDER STUDIES

Module I Key Concepts and Terminologies

Sex –Sexuality
Gender – Gendering – Parenting
Patriarchy – Matriarchy – Matriliney – Patriliney
Domestic Violence – Household management
Wife – Widow
Rape- Trafficking- Prostitution
Third Gender- Cross Dressers- LGBT

Module II Gender Studies As A Discipline

Gerda Lerner – The Creation of patriarchy
Simon de Bouver – The Second Sex
Problem of Invisibility and Marginalisation
Women as property of Men

Module III Gender Studies – The Indian Scenario

Altekarian Paradigm – Critique of Altekarian Paradigm – Brahmanical Patriarchy-
Uma Chakravarty
Seed and Earth- Leela Dube
Food and Caste- Leela Dube
Ecological Feminism – Women as creators of Life- Green Revolution and destabilizing
the life of Women– Contributions of Vandana Shiva
The Subaltern Cannot Speak- Gayatri Chakravorty Spivak
Rights over Land– Bina Aggarwal
Nature of Rape Trials- Pratiksha Baxi

Module IV Indian Society through Gender Perspective

Brahmanical Patriarchy – Widowhood
Three fold Oppression of Dalit Women
Bhakti and Sainthood
Caste and Gender

BOOKS FOR STUDY

Module I

1. V. Geetha, Gender
2. V. Geetha, Patriarchy
3. Uma Chakravarti, Gendering Caste through a Feminist Lens

4. Richard Ekins and Dave King, Blending Genders: Social Aspects of Cross Dressing and Sex Changing

Module II

1. Gerda Lerner, Creation of Patriarchy
2. Simon de Bouver – The Second Sex
3. Stephanie Coontz and Peta Henderson (eds.), Women's Work, Men's Property: The Origins of Gender and Class

Module III

1. A. S. Altekar, The Position of Women in Hindu Civilization: From Pre- Historic Times to the Present Day
2. Uma Chakravarti, Gendering Caste through a Feminist Lens
3. Uma Chakravarti, Everyday Lives, Everyday Histories: Beyond the Kings and Brahmanas of 'Ancient India'
4. Vandana Shiva, Staying Alive: Women, Ecology and Development
5. Vandana Shiva, The Violence of Green Revolution
6. M. N. Srinivas (ed.), Caste: Its Twentieth Century Avatar
7. Leela Dube, Anthropological Explorations in Gender
8. C. Nelson, L. Grossberg (eds.), Marxism and the Interpretation of Culture
9. Bina Agarwal, A Field of One's Own: Gender and Land Rights in South Asia
10. Pratiksha Baxi, Public Secrets of Law: Rape Trials in India

Module IV

1. Uma Chakravarti, Gendering Caste through a Feminist Lens
2. Uma Chakravarti, Everyday Lives, Everyday Histories: Beyond the Kings and Brahmanas of 'Ancient India'
3. Sharmila Rege, Writing Caste/ Writing Gender: Reading dalit Women's Testimonies
4. Sharmila Rege, Dalit Women Talk Differently: A Critique of 'Difference' and Towards a Dalit Feminist Standpoint Position, *Economic and Political Weekly*, Vol. 33, No. 44 (Oct. 31 - Nov. 6, 1998), pp. WS39-WS46
5. Gopal guru, Dalit women Talk Differently, *Economic and Political Weekly*, Vol. 30, No. 41/42 (Oct. 14-21, 1995), pp. 2548-2550
6. Vijaya Ramaswamy, Walking Naked: Women, Society and Spirituality in South India

BC4A13 ENTREPRENEURSHIP DEVELOPMENT

Lecture Hours per week : 5

Credits : 4
Internal : 20, External : 80

Objectives :

- To familiarise the students with the concept of entrepreneurship.
- To identify and develop the entrepreneurial talents of the students.
- To generate innovative business ideas in the emerging industrial scenario.

Module I

Entrepreneur and Fundamentals of Entrepreneurship: Entrepreneurial competencies – Factors affecting entrepreneurial growth – Role of entrepreneur in economic development - Challenges of women entrepreneurs.

20 Hours

Module II

Micro, Small and Medium Enterprises: Legal Framework – Licenses – Role of promotional institutions with special reference to KINFRA , KITCO , MSME & DICs – Concessions – Incentives and subsidies.

10 Hours

Module III

Project Management: Feasibility and Viability Analysis – Technical – Financial – Network – Appraisal and evaluation - Project Report preparation.

30 Hours

Module IV

Identification of Business Opportunities in the Context of Kerala: Rate of ED Clubs – Industrial Policies – Skill development for entrepreneurs – Business Incubation : Meaning - Setting up of Business Incubation Centres.

15 Hours

Reference Books :

1. S.S. Kanka , Entrepreneurial Development , Sultan Chand.

2. Prasanna Chandra , Project Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill.
3. Vasantha Desai , Dynamics of Entrepreneurial Development, Himalaya.
4. C.B. Gupta & N.P. Sreenivasan , Entrepreneurial Development , Sultan Chand.
5. Nirmal K Gupta , Small Industry –Challenges and Perspectives, Anmol Publications.
6. Vasantha Desai , Small scale Industries and Entrepreneurship, Himalaya.

BC4A14 BANKING AND INSURANCE

Lecture Hours per week: 5

Credits: 4

Internal : 20, External : 80

Objectives:

- To enable the students to acquire knowledge about basics of Banking and Insurance.
- To familiarise the students with the modern trends in banking.

Module I

Introduction to Banking : Meaning and definition - Origin and development of banking – Customer of a bank - Structure of banking in India – Banks and economic development – Functions of commercial banks (conventional and innovative functions) – Central bank – RBI – Functions –Emerging trends in banking.

15 Hours

Module II

Negotiable Instruments : Definition - Characteristics – Types – Parties to negotiable instruments – Cheques – Types of cheques – Crossing of cheques – Drafts - Cheque vs. Draft - Endorsement – Significance – Regularity of endorsement – Liability of endorser – Electronic payments.

15 Hours

Module III

E-Banking – Centralised Online Real time Electronic Banking (CORE) – Electronic Clearing Service (ECS) – Electronic Fund Transfer (EFT) – Real Time Gross Settlement (RTGS) – National Electronic Fund Transfer (NEFT) – Society for Worldwide Interbank Financial Telecommunication (SWIFT) – E-cheque – Any Time Money – ATM s – Credit card – Debit card – Smart card – Internet banking – Mobile banking – Tele-banking.

15 Hours

Module IV

Introduction to Insurance : Concept - Need of insurance - Insurance as a social security tool - Insurance and economic development - Principles of insurance - various kinds of insurance – Life and General insurance (Fire, Marine, Medical, Personal Accident ,

SEMESTER IV

C. No	Course Code	Course Name	Credit	Marks			Hours		
				Int	Ext	Tot	T	P	Tot
4.1	GEC4EG08	A04 ZEITGEST : Readings on Society and Culture	4	20	80	100	60		60
4.2	GEC4ED09	BC4A13 Entrepreneurship Development	4	20	80	100	60		60
4.3	SDC4FT15	Apparel Production and Quality Control	5	20	80	100	75		75
4.4	SDC4FT16	Environmental Textiles	4	20	80	100	60		60
4.5	SDC4FT17(P)	Surface Ornamentation	4	20	80	100		60	60
4.6	SDC4FT18(P)	Draping PSC Coaching	3 2	20	80	100		75	75
4.7	SDC4FT19(Pr)	Internship/Mini project	4	0	100	100		60	60
Semester IV Total			30			700	255	195	450

GEC4EG08A04: ZEITGEST: READINGS ON SOCIETY AND CULTURE

COURSE CODE	GEC4EG08
TITLE OF THE COURSE	A04 ZEITGEST : READINGS ON SOCIETY AND CULTURE
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	4
NO. OF CREDITS	4
NO. OF CONTACT HOURS	90(5hrs/wk)

GEC4ED09 – BC4A13 Entrepreneurship Development

Course No: 4.2
 Course Code: GEC4EDP09
 Course Name: BC4A13 Entrepreneurship Development
 Credits: 4
 Hours per week: 4
 Total hours: 60

Course Objective

On completion of this course, the student should be able to

- Familiarize with the concept of entrepreneurship
- Identify and develop entrepreneurial talents
- Generate innovative business ideas in emerging industrial scenario

Course Outline

ModuleI

Entrepreneur and fundamentals of entrepreneurship: characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

15 hours

ModuleII

Micro small and medium enterprises: legal framework – licenses – role of promotional institutions with special reference to KINFRA, KITCO, MSME&DICS – concessions – incentives and subsidies.

10 hours

ModuleIII

Project management: feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

20 hours

ModuleIV

Identification of business opportunities in the context of Kerala: rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

15 hours

Reference Books

- S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
- K Ramachandran, *Entrepreneurship Development*

SDC4FT15 – Apparel Production and Quality Control

Course No: 4.3

Course Code: SDC4FT15

Course Name: Apparel Production and Quality Control

Credits: 5

Hours per week: 5

Total hours: 75

6 Video Production Handbook Gerald Millerson New Delhi, Focal Press, 1992 7 Video Production Gerald Millerson New Delhi, Focal Press, 1999

GEC4ED12 – A14 Entrepreneurship Development

Course No: 4.3

Course Code: GEC4ED12

Course Name: A14 Entrepreneurship Development

Credits: 4

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Objectives

rs: 60

On completion of this course the student should be able to

- Familiarize the students with the concept of entrepreneurship
- Identify and develop the entrepreneurial talents of students
- Generate innovative business ideas in emerging industrial scenario

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Entrepreneur and fundamentals of entrepreneurship: - entrepreneurial competencies characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

Unit 2 (12 Hours)

Micro small and medium enterprises – legal framework – licenses – role of promotional institutions with special reference to kinfra, kitco. msme&dics – concessions – incentives and subsidies.

Unit 3 (10 Hours)

Project management – feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

Unit 4 (12 Hours)

Identification of business opportunities in the context of Kerala – rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

Unit 5 (14 Hours)

Strategic importance HRM; objectives of HRM; challenges to HR professionals; role, Responsibilities and competencies of HR professionals; HR department operations; Human Resource Planning - objectives and process; human resource information system. Talent acquisition, recruitment and selection strategies, career planning and management, training and development, investment in trainingprogramme; executive development.

References

1. S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
2. K Ramachandran, *Entrepreneurship Development*

SDC4MM13 - Production and Post-Production

Course No: 4.4

Course Code: SDC4MM13

Course Name: Production and Post-Production

Credits: 4

Hours: 60

COURSE OUTLINE

Unit 1

Exporting, uploading, Embedding video, Editing Principles, Editing Taxonomy, Codecs/compression/ Transcoding, Compressor, Color Correction, Compositing in Motion, DVD design and build

Unit 2

Language of Cinema: visual composition and visual space, balance, contrast, depth of field; narrative structure, three-act structure, dramatic aspects, acting, costumes, make up; cinematic aspects, camera, lighting and sound, mise-scene, shots, scene and sequence, editing-formal and stylistic techniques, generic organization of film.

Oracle Database Architecture - Preparing the Database Environment and Creating Database - Managing the Oracle Instance - Configuring the Oracle Network Environment - Managing Database Storage Structures - Administering User Security - Managing Data and Concurrency - Managing Undo Data Module - Implementing Oracle Database Security - Database Maintenance - Performance Management - Intelligent Infrastructure Enhancements - Backup and Recovery Concepts - Performing Database Backups - Performing Database Recovery - Moving Data Module

Unit 5 (15 Hours)

Database Architecture and ASM - Configuring for Recoverability - Using the RMAN Recovery Catalog - Configuring Backup Specifications - Using RMAN to Create Backups and recover - Performing User-Managed Backup and Recovery - Using RMAN to Duplicate a Database - Performing Tablespace Point-in-Time Recovery - Monitoring and Tuning RMAN Module - Using Flashback Technology - Diagnosing the Database - Managing Memory - Managing Database Performance - Space Management - Managing Resources - Automating Tasks with the Scheduler - Administering the Scheduler.

References:

1. *.Net Framework Essentials* .3rd Edition (O'Reilly)
2. *Beginning with C#.Net*. Wrox publications

GEC5LS15 - (S04 B.06) Life Skill Education & Presentation Skill

Course No: 5.3

Course Code: GEC5LS15

Course Name:(S04B.06) Life Skill Education & Presentation Skill

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.

Establish self-management and help to maintain work life balance.

Get an insight to career planning and development

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

Unit 2 (12 Hours)

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve interpersonal communication, effective public speaking interview, group discussion etc

Unit 3 (12 Hours)

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and sources, making a career decision, preparing a resume and tips

Unit 4 (12 Hours)

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional

intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

Unit 5 (12 Hours)

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with conflict, developing positive thinking, positive and negative self-talk, better selftalk, impacts , assertiveness, behaviour , importance of assertive behaviour.

References:

1.E Wachira, *Essential Life Skills*

SDC5IT18 (E1/E2/) - Elective 1

E1. Python Programming and Mobile Web

Course No: 5.5

Course Code: SDC5IT18 (E1)

Course Name: Elective 1 -Python Programming and Mobile Web

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Expertise Python Programming
- Learn web based applications for mobile devices

Prerequisites

- Basic Knowledge of Programming
- Knowledge of HTML and JavaScript

Course Outline

SDC4AT16 (E2) RISK MANAGEMENT AND INSURANCE**Lecture Hours per week: 5****Internal: 20, External: 80****Credits: 5****Total Hours : 75****Course Objectives:**

- To enable the students to understand risk, risk management process and techniques.
- To help the students to learn about risk financing.
- To understand risk management applications.

Course Details:

Module I : Risk: Meaning of risk - Degrees of risk - Cost of risk - Various elements of cost of risk - Sources of risk - Types of risk - Pure risk and speculative risk - Acceptable and non acceptable risks – Static and dynamic risk

15 Hours

Module II : Risk management - Characteristics of risk management - Significance - Principles of risk management - Objectives - Risk and risk management process – Risk identification - Evaluation - Risk management techniques -Selecting and implementing risk management techniques - Risk Management Information System - Organisation of risk management in business - Methods of risk management - Identification, measurement and control of risk - Evaluation, frequency and severity of losses - Pooling of risk - Insurance as risk pooling arrangements - Transferring of risks.

20 Hours

Module III : Commercial Risk Management Applications - Property - Liability - Commercial property insurance -Different policies and contracts - Business liability and risk management insurance - Workers' compensation and risk financing.

15 Hours

Module IV : Risk Management Applications - Loss of life - Loss of health - Retirement planning and annuities - Employee benefits - Financial and estate planning.

10 Hours

Module V : Risk Management Environment - Industry - Functions and organisation of insurers – Government regulation of insurance sector - IRDA - Privatisation of insurance business in India - Changes in Insurance Act - Insurance intermediaries - Insurance products pricing -Claim valuation – Foreign insurers in India.

15 Hours

Reference Books:

1. Rejda, George E: Principles of Risk Management and Insurance, Latest Edn, Addison Wesley Longm
2. McNamara: Principles of Risk Management and Insurance, Addison – Wesley
3. Dorfman: Introduction to Risk Management and Insurance, Prentice Hall.
4. Williams: Heins, Risk Management and Insurance, McGraw Hill Pub.
5. James S.Trieschman, Sandra G. Gustavsonh, Robert E. Hoyt: Risk management and Insurance, Thomson Asia Pvt. Ltd., Singapore.
6. G. Kotheshwar Rao , Risk Management. 7. Gulati, Risk Management.
8. Dr.P.K.Gupta, Insurance and Risk Management, Himalaya Publishing House.
9. Insurance Act - Latest.

COMMUNICATION SKILLS IN ENGLISH

Code	Contact Hrs/week	Credit	Semester
FEN1B01	6	5	1

Courses Objectives

- To develop confidence to respond in English during situation where the use of English is imperative
- To develop fluency in actual conversation in the English language.
- To develop the speech skills necessary for confident and intelligent participation in group discussion and to make formal and extempore speeches in English.
- To develop the skills related to teamwork and to take up team leader roles in society as well as in future workplace.

Learning Outcomes

- Learners improve their ability to express themselves in English in formal and informal situations.
- They identify the linguistic and pragmatic variations in English in relation to context and speakers.
- They attain an advanced level of mastery in all the macro skills of English.

Course Outline

Module I: Communication Theory

Communication- Brief History of Human Communication-Meaning- Importance and Process- Characteristics of Communication-Objectives –Types of Communication-Verbal & Non-Verbal Communication- Models of Communication and Modeling: Linear Model & Transactional Model- Communication Competence.

Module II: Day-to-day English

At a restaurant-ordering, offering, polite questions- **At a bus stop**- making requests, enquiring, giving suggestions, asking for directions-**At a hospital**-seeking help, giving instructions- **At a school/college**- encouraging, expressing probability, obligations.

(Enough oral drills in diverse realistic situations, both in pairs and groups, have to be done to ensure maximum performative skills of learners)

Module III: Oral communication skills

Presentations Skills (pair/single)- specific language/expressions for starting a presentation-introducing a point-listing ideas-comparing and contrasting-concluding a topic. **Mock TV News Reading**-pitch-intonation, rhythm-**Preparing and presenting short skits**-enacting scenes from dramas. **Preparing and delivering speeches**-welcome, inaugural, presidential and vote of thanks-extempore speeches-**Evaluating oral presentations.**

(Learners have to be sensitized and exposed to the language/expressions used in these different contexts. They also have to be given adequate practice to improve their performative abilities in English)

Module IV: English for Discussion/Debating Skills

Group Discussion-(controlled , guided and free) guidelines-polite expressions for disagreeing, agreeing, adding, interrupting, suggesting-**Mock Press Conference**-Polite expressions for seeking/expressing opinions in formal contexts- **Demonstration**-(language focused like cookery show, introducing a product, its function etc) vocabulary and structures used in this.

Core Texts

Taylor, Grant. Situational Conversational Practise. New Delhi: Tata Macgraw Hill, 1975.

Sunitha K.S, Annie Pothan & Sumitha Joy. Communication Skills for English Conversation

Practice: A Practice Guide to Improve Conversation Skills. New Delhi: Sterling Publishers 2006.

Suggested reading

Kennedy, Chris and Rod Bolitho. English for Specific Purpose. London : Macmillan, 1984
Gaber, Don. How to Start a Conversation and Make Friends. New Delhi: Sudha Publication. 1994.
Thomson, Neil. Communication and Language: A Handbook of Theory and Practice. Palgrave Macmillan, 2003
Practice Workbook - Premanand M E & Prasanth V G et al. *Nuts and Bolts of English*. Dept. of English, 2017. ISBN 978-81-920171-3-6

ADVANCED ENGLISH GRAMMAR

Code	Contact Hrs/week	Credit	Semester
FEN2B02	6	4	2

Course Objectives

- To enable the students to use English correctly and confidently in writing and speech.
- To foster communicative competence by improving grammatical skills.
- To introduce learners to the advanced areas of English grammar and usage.

Learning Outcomes

- Learners get exposed to advanced level of grammatical patterns and usages in English.
- They improve their skills to speak and write English accurately.
- They enhance their skills to analyse the internal patterns and functions of language in different contexts.

Course Outline

Module I

Parts of Speech-Sentence Structure (NP,VP)-Verbs (regular and irregular)-Auxiliary Verbs- primary, modal and semi-modal-Pronouns -personal, reflexive, emphatic, demonstrative, indefinite.

Module II

Time and Tense-Articles-Reporting-Tag Questions-Passive/active Voice

Module III

Comparison of adjectives-Concord-Sentence types based on clauses.

Module IV

Conjunctions (coordinating and subordinating)-Prepositions-Conditional sentences and wishes-common errors.

Core reading

Betty Azar .Understanding and Using English Grammar. Longman
David Green. Contemporary English Grammar, structures and composition. Trinity

Suggested reading

UR. Penny, *Grammar Practice Activities: A Practical Guide for Teachers*. Cambridge:CUP,2008
Hewings, Martin.*Advanced Grammar In Use* .New Delhi: CUP,2008
Leech, Geoffrey, and Jan Svartvick. *A Communicative Grammar of English*. London: Longman 1998
E-book available at www.englishskillsone.com

Core CourseXIV ++++++ Human Rights

Module I : Human Rights : Meaning, evolution and importance.

Approaches to the study : Western, Marxian, Feminist and Third World.

Module II : UNO and Human Rights : Universal Declaration of Human Rights

Module III : Human Rights in India: Constitutional provisions. Right to Information Act.

Module IV : Instrumentalities for the protection of Human Rights : National Human Rights Commission, Judiciary and Media.

Module V : Human Rights Movements : Amnesty International, World Watch, Asia Watch, Peoples Union for Civil Liberties, Environmental Movements.

Module VI : Challenges to Human Rights : Terrorism, Religious fundamentalism,

Police atrocities against women, children and other marginalized sections.

Books and References

1. Andrew Clapham : Human Rights: A Very Short Introduction, Oxford University Press, New York, 2007.
2. Chiranjeevi Nirmal : Human Rights in India, Oxford University Press, New Delhi, 1997.
3. Darren J.O Byrne, (ed) : Human Rights : An Introduction, Pearson Education Pvt Ltd, New Delhi, 2004.
4. Janusz Symonides (ed) : New Dimensions and Challenges for Human Rights, Rawat Publications, Jaipur, 2006.
5. Johari J.C : Human Rights and New World Order, Anmol Publications, New Delhi, 1998.
6. Krishna Iyer.V.R. : Minorities, Civil Liberties and Criminal Justice, People's Publishing House, New Delhi, 1980.
7. Shashi Motilal & Bijayalaxmi : Human Rights, Gender and Environment, Allied Publishers, New Delhi, 2006
8. South Asia Human Rights Documentation Centre : Introducing Human Rights, Oxford University Press, New Delhi, 2007.
9. Ujjwal Kumar Singh (ed) : Human Rights and peace : Ideas, Laws, Institutions and Movements, Sage, New Delhi, 2009.
10. Upendra Baxi : Inhuman wrongs and Human Rights, Har Anand, New Delhi, 1994
11. Upendra Baxi : The Right to be Human, Lancer International, New Delhi, 1987.
12. Darren O'Byrne, Human Rights, Pearson, 2012.

Journal

Indian Journal of Human Rights.

Open Course II ++++++ Human Rights in India

Module I : (A) Concept of Human Rights : Meaning, evolution and importance.

(B) Approaches : Western, Marxian and Third World.

Module II : UNO and Human Rights : Universal Declaration of Human Rights: A brief analysis

Module III : (A) Indian Constitution and Human Rights: Civil and Political Rights,
Socio-economic and cultural Rights.

(B) Acts on Human Rights : Right to Information

Module IV : Agencies for protecting Human Rights : Judiciary, Public Interest Litigation (PIL), National Human Rights Commission and Media.

Module V : (A) Human Rights Movements in India : Peoples Union for Civil Liberties (PUCL), Environmental movements.

(B) Challenges to Human Rights in India. Human Rights violations among Minorities, Dalits and Adivasis, women, children and othermarginalized sections. State and Human Rights : Police atrocities.

Book and References

1. Andrew Clapham, Human Rights : A very short Introduction, Oxford University press, New York, 2007.
2. Chiranjeevi Nirmal, Human Rights in India, Oxford University Press, New Delhi, 1997.
3. Darren J.O.Byrne, (ed), Human Rights : An Introduction, Pearson Education Pvt Ltd, New Delhi, 2004.
4. Janusz Symonides (ed), New Dimensions and Challenges for Human Rights, Rawat publications, Jaipur, 2006.
5. Johari J.C Human Rights and New world Order, Anmol Publications, New Delhi, 1998.
6. Krishna Iyer. V.R Minorities, Civil Liberties and criminal Justice, People's Publishing House, New Delhi 1980.
7. Shasi Motilal & Bijaya Laxmi : Human Rights, Gender and Environment Allied Publishers, New Delhi, 2000.
8. South Asia Human Rights Documentation Centre : Introducing Human Rights, Oxford University Press, New Delhi, 2007.
9. Ujjal Kumar Singh : Human Rights and Peace : Oxford University Press, New Delhi, 2009.
10. Upendra Baxi : Inhuman wrongs and Human Rights, Har Anand, New Delhi, 1994.
11. Upendra Baxi: The Right to be Human, Lancer International, New Delhi, 1987.

Journal Indian Journal of Human Rights

Core Course XIV - POL6BO4 Introduction to Public Administration

In this course the students are provided an introduction to the discipline of Public Administration with a special focus on contemporary administrative developments. The course explores some of the systems and structures in public administration. The paper contains certain classical and contemporary administrative theories. The course also provides the students a comprehensive understanding on major elements of public administration

Module I.

Definition, nature, scope and importance of Public Administration

-Public Administration and Private Administration.

Theories of Administration. Scientific Management; Human Relations; Bureaucratic theories.

Module II.

Administrative Law - Rule of Law - Delegated legislation - Administrative Adjudication.

Module III.

Principles of Organisation; Hierarchy -Unity of command - Span of control- Delegation - Co-ordin ation – Communication.

Module IV-

Development Administration-Weberian and Rigg's model

Module V.

Personnel Administration

- a) Spoils, Merit Bureaucratic, Aristocratic and Democratic systems
- b) Bureaucracy - Meaning – Characteristics - Defects and merits - U.P.S.C and State P.S.Cs

Books and References

1. A. Avasthi and S. R. Maheswari, Public Administration, Agra, Lakshmi Narain Aggarwal, 1996.
2. D. D. Basu, Administrative Law, New Delhi, Prentice Hall, 1986.
3. C. P. Bhambri, Administration in a Changing Society: Bureaucracy and Politics in India, Delhi, Vikas, 1991.
4. S. R. Maheshwari, Administrative Theories, New Delhi, Allied, 1994.
5. S. R. Nigam, Principles of Public Administration, Allahabad Kitab Mahal, 1980.
6. Bidyut Chakrabarty, Reinventing Public Administration: The Indian Experience, Orient Longman, 2007
7. Noorjahan Bava, Development Policies and Administration in India, Delhi: Uppal Publishers, 2001.
8. J. Perry, Handbook of Public Administration, San Francisco, Jossey-Bass, 1989
9. R. K. Arora and S. Sharma (eds.), Comparative & Development Administration: Ideas & Action, Jaipur, Arihant, 1992.
10. S. S. Gadkari and M. R. Kolhetkar, Introduction in Public Administration, New Delhi, Allied Publishers, 2000.
11. Pradeep Sahni and Etakula Vayu Nadan, Administrative Theory, PHI Learning, New Delhi 2010

SEMESTER I**CORE COURSE****NO. OF CREDITS: 5****SOC1 C03 SOCIOLOGY OF INDIAN SOCIETY**Objectives

- To introduce the different approaches to the study of Indian Society
- To discuss the different issues of Indian society
- To analyse the transformations in Indian society

MODULE 1 INDIAN SOCIETY: HISTORICAL EMERGENCE

1. Historical context and emergence of Modern India- British rule and its impact (A.R.Desai, Ramachandra Guha)
2. Freedom Movement and the emergence of the Indian Nation (A.R,Desai)
- 1.3 Indian society in the post Independent era (Contemporary India-Deshpande)

MODULE 2 APPROACHES TO THE STUDY OF INDIAN SOCIETY-I

- 2.1 Development of Sociology in India, Contextualisation and Indegenisation
- 2.2 Indological approach: Louis Dumont-Homo Heirarchicus, Purity - Pollution, Ghurye- Origin and Features of Caste System
- 2.3 Structural-Functional approach: Srinivas- Social structure and Mobility, Dube- Village Society

MODULE 3 APPROACHES TO THE STUDY OF INDIAN SOCIETY-II

- 3.1 Cultural approach: Surajit Sinha-Tribes and Indian Civilisation , N.K.Bose- Civilisational View of Indian Society
- 3.2 Dialectical approach: D.P.Mukherjee- Indian Social Structure , A.R.Desai- Social Unrest and Nationalism
- 1.1 Subaltern approach: David Hardiman- Devi Movement, Ambedkar- *Annihilation of Caste*

MODULE 4 CURRENT ISSUES IN INDIAN SOCIETY

- 4.1 Contemporary Issues in India: Poverty, Inequality of Caste and Class, Issues in Agrarian Sector
- 4.2 Secularism, Communalism, Ethnicity
- 4.3 Nationalism- Views of Tagore, M.K Gandhi ,Nehru, Constitutional Views

References

- Beteille.A. - Caste, Class and Power
- Desai. A.R. - Rural Sociology in India
- Desai. A.R. - Modernisation of Under developed Societies
- Kolenda. P.M. - Caste in Contemporary India
- Mandelbaum. D.G. - Society in India
- Kapadia. K.M. - Marriage and Family in India
- Singer.M. & Cohn.B - Structure and Change in Indian Society
- Singh, Yogendra - Modernisation of Indian Tradition
- Srinivas. M.N. - Social Change in Modern India
- Srinivas. M.N. - On Living in a Revolution and Other Essays
- Kothari, Rajini - Caste in Indian Politics
- Dumont.L. - Homo-heirarchicus
- Srinivas. M.N.(Ed) - India's Villages
- Srinivas. M.N. & Bardan.P.K.(Ed) - Rural Poverty in South Asia
- Das, Veena - Structure and Cognition- Aspects of Hindu Caste and Ritual
- Frankel & Rao M.S.A - Dominance and State power in Modern India
- Karve, Irawati - Kinship Organisation in India
- Alavi, H & Harris,J (Ed) - Sociology of Developing Societies-South Asia
- D.N.Dhanagare - Themes and Perspectives in Indian Sociology
- Dipankar Gupta (Ed) - Social Stratification
- Dipankar Gupta - Interrogating Caste
- Yogesh Atal (Ed) - Understanding Indian Society
- Fuller.C.J.(Ed) - Caste Today
- Shah. A.M. - The Family in India: Critical Essays
- Uberoi, Patricia (Ed) - Family, Kinship and Marriage
- Deshpande, Satish - Contemporary India
- Veena Das - The Oxford Companion to Sociology and Social Anthropology

SEMESTER I**CORE COURSE****NO. OF CREDITS: 5****SOC1 C04 RURAL AND TRIBAL SOCIETIES IN INDIA**

Objectives

- 1 To acquaint students with basics of rural and tribal societies in our country
- 2 To analyze rural and tribal problems
- 3 To provide knowledge of rural and tribal social institutions

MODULE 1 RURAL AND PEASANT SOCIETY

Scope and importance of the study of rural society in India

Rural Society, Peasant Society, Agrarian Society: Features

Perspectives on Indian Village Community: Historical, Ecological

Nature and changing dimensions of village society, Village Studies – Marriot & Beteille

MODULE 2 CHANGING RURAL SOCIETY

- 2.1 Agrarian Social Structure, Land Ownership and Agrarian Relations
- 2.2 Emergent Class Relations, Decline of Agrarian Economy, De-peasantization
- 2.3 Land reforms and its impact on rural social structure with special reference to Kerala
- 2.4 Migration, Globalisation and rural social transformation

MODULE 3 GOVERNANCE IN RURAL SOCIETY

- 3.1 Rural governance: Village Panchayat, Caste Panchayat, Dominant Caste
- 3.2 Decentralisation of Power in Village Society, Panchayati Raj
- 3.3 Community Development Programme in India
- 3.4 People's Planning Programme: A critical appraisal

MODULE 4 TRIBAL SOCIETY IN INDIA

- 4.1 History of Indian Tribes, Demographic Features
- 4.2 Integration of the Tribals with the Non-Tribals , Tribe- Caste Continuum,
- 4.3 Tribal Problems in India

4.4 Approaches, Planning and Programmes for Tribal Development

References

- 1-Das veena (ed),2003 “Oxford India companion to sociology and social anthropology
- 2 Desai . AR (ed),1978 Rural sociology in India, Bombay,popular
- 3 Doshi. SL & PC jain 1999 Rural sociology , jaipur,Rawat
- 2 Singh K.P. (ed.) Tribal Development in India (N. Delhi : Uppal, 1988).
- 3 Singh K.S. (ed.) Tribal Situation in India (Simla : Indian Institute of Advanced Study, 1972)
- 4 Ghurye G.S. The Scheduled Tribes
- 7 Punit , AE 1978 social system in rural India Delhi,sterling
- 8 Rao MSA (ed) 1974 urban sociology,orient longman Hyderabad
- 9 Gupta, Dipankar (ed.) Social Stratification (New Delhi : Oxford, 1992) (See John Mencher, The Caste System Upside Down)
- 10 Vidyarthi L.P. The Tribal Culture of India (N. Delhi : Concept, 1985)

UNIVERSITY OF CALICUT

Master of Commerce (CBCSS)

Semester II

MCM2C10: MANAGEMENT SCIENCE

80 Hours

Marks: 80

Objectives:

1. To familiarize students with concepts of management science and tools supporting decision making
2. To enable students to apply Management science techniques in appropriate decision situations.

Contents:

Module 1:

Introduction to Management Science- Types of decisions; Steps in decision making; Quantitative analysis and decision making; Different types of models and their uses; Model building steps.

10 hours

Module 2

Linear Programming: Basic concepts; mathematical formulation and applications; Solution of LP problem using graphic and simplex method; – Application in Business.

Transportation and Assignment: Formulation; Solving transportation (NWC method – Least Cost method – Vogel's approximations method – stepping stone method – Modified Distribution method) and assignment problems (Hungarian Method).

25 hours

Module3

Inventory and Queuing Management: Concepts of *inventory management*; Inventory models – classical EOQ, planned shortage model- deciding optimum safety stock and reorder level. *Queuing models:* Elements of a queuing system; Models with Poisson arrival and Exponential services rates- single server and infinite and finite population.

17 hours

Module 4

Project Scheduling: Concepts of PERT & CPM techniques and their applications; Network analysis- scheduling activities, determining critical path, calculation of floats; Time-cost trade-off; Resource allocation and resource levelling.

18 hours

Module 5

Markov Chains and Theory of Games: Markov Chains- decision processes; Market share analysis; Account receivable analysis. Game Theory- Pure strategy games; Mixed strategy games; Value of the game; Rules of Dominance.

10 hours

Theory 30% Problems 70%

References:

1. Anderson: Introduction to Management Science – Quantitative Technique for Decision making Thomson.
2. Operations Research – Kautiswarup, P.K. Gupta, Manmohan – Sultan Chand & Sons.
3. Operations Research SD Sharma, Kadar Notes, Ramnath&G. Meerut.
4. OR Techniques for management – VK Kapoor & Sumant Kapoor – Sultan Chand & Sons.
5. Quantitative Techniques in Management, Vohra N.D., The McGraw Hill companies

HIS5B07 KERALA SOCIETY AND CULTURE: ANCIENT AND MEDIEVAL

Module-I Kerala's Physiographical Features and Early History of the Region

Geographical features-rivers-mountains-passes-lagoons-sea coast-monsoon
Early human settlements-Peleolithic, Neolithic Periods
Iron Age in Kerala-Megalithic Culture-Megalithic sites
Kerala as a part Tamilakam
Sangam Literature: Pathittupathu, Akananuru and Purananuru
Kerala's maritime contacts-Pattanams (trade centres)-internal trade mechanisms

Module-II Polity and Society in the Perumal Era

Sources

Inscriptions- Terisapalli Copper Plate
Literature-Sanakaranarayaneeyam- Tamil Bhakti Literature- Arab Chinese accounts
Monuments-Tiruvanchikulam temple- Cheraman Masjid
Brahmin Migration to Kerala
Perumals of Mahadayapuram
Features of administration
Trade guilds and land grants –Anchuvannam –Manigramam -Valanchiyar,-
Nannadeshikal- Nuttuvar- Uralar, Karalar.
Bhakti saints- Alwars and Nayanars
Proliferation of temples-Devadasi system
Sankaracharya
Disintegration of Perumal kingdom

Module-III Age of Naduvazhis

Formation of Nadus and Swarupams- Venad
Expansion of agriculture
Emergence of village communities
Sanketams
Manipravalam Literature
Sandeshakavyas- Unnineeli Snadesham
Charitam-Unniyadi Charitam
Champu- Bhasha Naishadham Champu
Lilathilakam
Chinese trade- Arab trade- Medieval Angadies.

ModuleIV Advent of Europeans

Situation of Kerala at the time of the coming of Portuguese
Zamorin- Kunjali Marakkar

The Dutch- Hortus Malabaricus- Martanda Varma
The French
The English-
Mysorean Interlude
Subsidiary Alliance
Malavalam Bhakthi Literature and Structuring of Malayalam Language
 Thunchathu Ezhuthachan- Kilippattu
 Kunchan Nambiar- Thullal
 Poonthanam- Jnanappana

Maps

1. Important Centres of Megalithic Culture
2. Distribution of the Inscriptions of Perumals
3. Important Nadus
4. Centres of Colonial Settlements

BOOKS FOR STUDY

Module I

1. A. Sreedhara Menon, A Survey of Kerala History
2. M. G. S. Narayanan, Foundations of South Indian Society and Culture
3. Elamkulam P. N. Kunjan Pillai, Studies in Kerala history
4. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
5. K. N. Ganesh, Keralatthinte Innalekal
6. M. R. Raghava Warriar, Keraleeyatha Charithramanangal
7. Cherian, P.J.,(ed.), *Perspectives on Kerala History*, Trivandrum, 1999.

Module II

1. M. G. S. Narayanan, Foundations of South Indian Society and Culture
2. M. G. S. Narayanan, Cultural Symbiosis in Kerala
3. M. G. S. Narayanan, Perumals of Kerala
4. Elamkulam P. N. Kunjan Pillai, Studies in Kerala history
5. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
6. K. N. Ganesh, Keralatthinte Innalekal
7. P.J. Cherian (ed.), *Perspectives on Kerala History*, Trivandrum, 1999.
8. Kesavan Veluthatt, Brahmin Settlements in Kerala

Module III

1. Elamkulam P. N. Kunjan Pillai, Unnuneelisandesham Charithradrushtiyiloode
2. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram*
3. K. N. Ganesh, Keralatthinte Innalekal
4. M. R. Raghava Warriar, Madhyakaala Keralam
5. Cherian, P.J.,(ed.), *Perspectives on Kerala History*, Trivandrum, 1999.

Module III

1. Rajan Gurukkal and Raghava Warriar, *Kerala Charitram(Part II)*
2. K. N. Ganesh, *Keralatthinte Innalekal*
3. K. N. Ganesh, *Kunchan Nambiyar: Vakkum Samoohavum*
4. K. M. Panikkar, *History of Kerala*
5. A. Sreedhara Menon, *A Survey of Kerala History*

HIS6E04 HISTORY OF HUMAN RIGHTS

Module I: Basic Concepts and Origin of the of Human Rights

1. Basic Concepts- Human Rights – human rights culture- Crimes against humanity- Genocide– Racism – Slavery– Apartheid—Torture- Right to food, education, health, housing, work – Discrimination- Equality– Trafficking – Migrant workers – Death penalty- Displacement
2. Magna Carta – The Bill of Rights, 1689 – John Locke’s Second Treatise of Government, 1690 – The Social Contract, 1762– United States Declaration of Independence, 1776– Declaration of the Rights of Man and of the Citizen, 1789 – Thomas Paine and The Rights of Man, 1791– Vindication of the Rights of Woman, 1792.

Module II: World Wars and the Historical Development of International Human Rights

1. Fight for Right Movement, 1915 – Fourteen points of President Wilson, 1918- League of Nations – League Covenant
2. H G Wells and the Rights of Man, 1940— Charter of the United Nations, 1945-- The Universal Declaration of Human Rights, 1948 – UN Human Rights Commission – International treaties and measures for the protection of human rights- Martin Luther King’s ‘I have a Dream’

Module III: Human Rights in Practices and Major Incidents of Violation

1. Legal restrictions on freedom– Limitations on politics and expression– Amnesty International– Human Rights Watch
2. Abu Gharib prison- Privacy of the individual –Human rights violations in Sri Lanka.

Module IV: Human Rights Situation in India

1. Indian constitution- Fundamental Rights

2. Discrimination on the grounds of caste– minority rights issues– Delhi Riots- Gujarat carnage- Teesta Setalwad- Irom Sharmila- Displacement due to the process of development- Adivasis' plight.

Book list

Module I:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, Human Rights: Confronting Myths and Misunderstandings
3. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
4. Bertrand G. Ramcharan, Contemporary Human Rights Ideas, Routledge, 2008
5. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
6. Charles R Beitz, The Idea of Human Rights
7. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations

Module II:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, Human Rights: Confronting Myths and Misunderstandings
3. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
4. Bertrand G. Ramcharan, Contemporary Human Rights Ideas, Routledge, 2008
5. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
6. Charles R Beitz, The Idea of Human Rights
7. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations
8. Roger Hormand and Sarah Zaidi, Human Rights at the UN: The Political History of Universal Justice

Module III:

1. Andrew Clapham, Human Rights A Very short introduction, Oxford, 2007 (for the first three chapters)
2. Andrew Fagan, The Atlas of Human Rights: Mapping Violations of Freedom around the Globe
3. Brayan S Turner, Vulnerability and Human Rights: Essays on Human Rights
4. Robert F Gorman & Edward S. Mihalkanin, Historical Dictionary of Human Rights and Humanitarian Organizations

5. Thomas G. Weiss et. al.,(eds.), Wars on Terrorism and Iraq: Human Rights, Unilateralism and US Foreign Policy

Module IV:

1. A.R.Desai(ed.), Violations of Democratic Rights in India
2. Teesta Setalvad, Gujarat: Behind the Mirage
3. V. B. Mishra, Evolution of the Constitutional History of India (1773- 1947)
4. Ashis Nandy, et.al., Creating a Nationality: Ramjanmabhumi Movement and the fear of the Self
5. Asghar Ali Engineer(ed.), The Gujarat Carnage
6. Harsh Mander, Cry, My Beloved Country: Reflections on the Gujarat Carnage 2002 and its Aftermath
7. Uma Chakravarti, Nandita Haksar, The Delhi Riots: Three Days in the Life of a Nation
8. Deepti Priya Mehrotra, Burning Bright: Irom Sharmila and the Struggle for Peace in Manipur
9. Sanjukta Das Gupta, Raj Sekhar Nasu (eds.), Narratives from the Margins: Aspects of Adivasi History in India
10. Daniel Rycroft, Sangeeta Dasgupta (eds.), The Politics of Belonging in India: Becoming Adivasi

- Dominwski , R.L., (1980) , Research Methods , New Jersey , Prentice Hall Inc.
- Misra R.P., (1983), Research Methodology Hand Book , New Delhi, Concept Publishing co.
- Neuman, Social Research Methods, 6/e, Pearson
- Young , P.V.&Schmid.C.F., Scientific Social Surveys and Research , Prentice-Hall of India Pvt. Ltd.
- Goode, W.J., & Hatt ,P.K.(1981) ,Methods in Social Research , McGraw Hill,NY
- Bailey Kenneth.D ., (1978) , Methods of Social Research ,Free Press , New York
- Kothari , C.R .,(1985) , Research Methodology: Methods and Techniques , New Delhi,
Wiley Eastern Ltd.

CORE COURSE

SOC4 B.06 LIFE SKILL DEVELOPMENT

No of credits: 4

Objectives

1. To provide with the knowledge of necessary life skill for the application in everyday life
2. To enhance the quality of addressing issue relevant to the life situations
3. To enable the students to establish productive interpersonal relationships with others
4. To equip students for handling specific issues

MODULE I INTRODUCTION TO LIFE SKILL EDUCATION

- I. 1. Definition of Life skills, Components of life skills, Need for Life skill training
- I. 2. Life Skill a Life Course approach: (a) critical thinking skills / decision making skills
(b) interpersonal/ communication skills (c) coping and self management skills .

MODULE II COMMUNICATION SKILLS.

- II.1. Communication: Definition, Types, Components -Verbal and Non Verbal Communication.
- II.2. Effective interpersonal communication
- II.3. Person to group communication: Public Speaking, Interview facing and Group Discussion

MODULE III CAREER PLANNING

III.1.Choosing a Career, Career Planning, Need and importance of Career Guidance

III.2. Career Guidance Centres, Sources of career information: Job Fair, Career Magazines,
Computerised job Search

III.3. Applying for a Job: Preparation of Resume, Follow up communication

MODULE IV SELF MANAGEMENT

IV.1. Self Esteem, Self awareness, Self control

IV.2. Emotional Quotient and Social Quotient

IV.3. Coping with emotions, Stress and strain

IV. 4. Conflict resolution, Steps and stages

IV. 5. Developing Positive thinking and Assertiveness

Reference

Elizabeth Hurlock (1968), Development Psychology, Mc Grew Hill

Baron A Robert and Byrne Donn (2003), Social Psychology, Prentice Hall of India

Delors, Jacques (1997), Learning: the Treasure Within, UNESCO , Paris

UNESCO and Indian national Commission of Co operation with UNESCO (2001), Life Skill
in Non formal education A Review, UNESCO , Paris

WHO (1999), Partners in Life Skill Education: Conclusions form a UN Inter Agency
Meeting, WHO, Geneva

Pathanki, Dhum (2005), Education in Human Sexuality: a Source Book for education, FPA
India and IPPF, Mumbai

Swathi Y Bhave (ed) (2006), Bhave's Text Book of Adolescent Medicine, Jaypee Brothers
medical Publishers , New Delhi

MKC Nair , et al (ed.)(2001), Family life education and AIDS Awareness training Manual for Minus two to
plus two

Websites

www.unesco.org

www.un.org

www.unfpa.org

www.who.int/en.

CORE COURSE

SOC5 B.07 SOCIOLOGY OF INDIAN SOCIETY

No. of Credits: 4

Objectives

1. To provide a sociological perspective for understanding the dynamics of Indian Society
2. To analyse the changes occurred in the various institutions in Indian Society

MODULE 1 FEATURES OF INDIAN SOCIETY

- I.1. Features of Indian Society- Rural and Urban
- I.2. Forms of Diversity in India-Linguistic, Religious, Racial, Ethnic
- I.3. Bonds of Unity in India-Geographical, Religious, Political

MODULE II FAMILY, MARRIAGE AND KINSHIP

- II.1. Family in Indian Society- Structural and Functional Changes
- II.2. Marriage in Indian Society-Structural and Functional Changes
- II.3. Kinship- Definition, Types, Terminology

MODULE 111 RELIGION, CASTE AND CLASS IN INDIA

- III.1. Caste: Changes in Indian Caste System: Sanskritisation, Westernisation, Modernisation,
Recent trends in Indian Caste system, Backward Classes: Scheduled Caste and Dalits,
Other Backward Classes

IV.1. Symbolic Interactionism: Historical roots-pragmatism and behaviourism, Influence of
Willaim James and John Dewey

IV.2. Major Contributors: G.H.Mead- Mind Self and Society, C.H.Cooley- Looking Glass Self
Reference

Adams, Bert and R.A. Sydie. 2001. Sociological Theory. Thousand Oaks,C.A: Pine Forge Press.

Abraham, Francis.M. 1982. Modern Sociological Theory: An Introduction, Oxford university Press

Cohen,Percy.S. 1979. Modern Social Theory, Heinemann Educational Books Ltd and The
English Language Book Society

Collins, Randall. 1986 . Weberian Social Theory. Cambridge: University Press.

Coser, Lewis. 1977, Masters of Sociological Thought, (2ed.) New York: Harcourt, Brace &
Jovanovich.

Delaney, Tim. 2008, Contemporary Social Theory, Investigation and Application. New York:
Prentice Hall.

Good, Erich. 1988. Sociology, 2nd Edition. Englewood Cliffs, NJ: Prentice Hall.

Kinloch,Graham.C.1977, Sociological Theory:Its Development and Major Paradigms,
MacGraw-Hill Book Company

Kundu, Sociological Theory, Pearson

Ritzer, George. 2000d. Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2000c. Modern Sociological Theory. 5th ed. Boston: Mc Graw Hill.

Ritzer, George. 2003. Contemporary Sociological Theory and its Classical Roots. Boston:
Mc Graw Hill.

Turner, Jonathan. H. 2003. The Structure of Sociological Theory. Belmont, CA: Wadsworth.

CORE COURSE

SOC5 B.09 SOCIAL ANTHROPOLOGY

No of credits: 4

Objectives

1. To introduce the basic concepts of Anthropology
2. To familiarize with Anthropological studies in India by focusing on Tribal Communities in the country in general and in the state of Kerala in particular

MODULE I INTRODUCTION TO ANTHROPOLOGY

- I. 1. Definition, Meaning, Nature, Scope of Anthropology, Origin of Social Anthropology
- I. 2. Methods of Anthropology: Case study, Ethnography – Focused Interview, Participant and non- participant observations

MODULE II CULTURE & SOCIETY

- II. 1. Definition, Components of Culture, Characteristics of Culture, Stages of Cultural Evolution
- II.2. Theories of Culture: Functionalist thought of Anthropology: Malinovsky, Structural theory: Levi- Strauss and Radcliff Brown
Theories of cultural process: Evolution, Acculturation, Assimilation, Diffusion, Enculturation, Integration
- II. 3. Social Institutions in Primitive Society: Marriage, Family, Kinship, Kinship Usages, Class & Lineage Totem, Religion and Magic

MODULE III TRIBES IN INDIA

- III. 1. Definition and characteristics of Tribes, Population Composition and distribution of Indian tribes, Socio – economic status of Indian tribes
- III.2. Tribes in Indian Constitution, Tribal Welfare in India
- III.3. Tribal movements in India, Tribes in transition

MODULE IV TRIBES IN KERALA

- IV.1. Characteristics, Composition and distribution,

IV.2. Tribal issues in Kerala: Landlessness, Poverty

IV.3. Field visit to a Tribal Area

(The seminar presentations in the paper should be based on the field visit. Group presentations based on the different aspects of the socio cultural life of the tribals visited should be assigned grades. Each group should consist of maximum five students. No Member shall be exempted from the presentation. Participation of each member will be considered in the process of evaluation. Grades will be assigned individually on the basis of presentation and participation. These grades would be counted as the grades for seminar presentation as part of the internal assessment)

Reference

Madan and Majumdar, An Introduction to Social Anthropology

Makhan Jha, An Introduction to Anthropological thought

Herskovits M.T, Cultural Anthropology

Leela Dube, Sociology of Kinship

Balbir Singh Negi, Man, Culture and Society

Nadeem Hasnain, Tribal India

Arup Maharatra, Demographic perspectives on India's tribes

K.S. Singh, The Scheduled Tribes

Roy Busman, Tribes in Perspective

Mathur PRG, Tribal situation in Kerala

CORE COURSE

SOC5 B.10 RESEARCH METHODS AND STATISTICS

No. of credits: 4

Objectives

1. To provide basic understanding in social statistics.

Ann Oakley: Sex Gender And Society

Haralambos, Michael : Sociology-Themes and Perspectives, Oxford University Press.

CORE COURSE

SOC6 B.14 POPULATION AND SOCIETY

No. of Credits: 4

Objectives

1. To provide a basic theoretical explanation of population studies and related concepts.
2. To provide critical analysis of the population theories
3. To analyse the changes in population in society

MODULE 1 POPULATION STUDIES

- I.1. Population Studies, Definition, Nature, Subject matter and Scope of Population Studies
- I.2. Relation of Population Studies with other Social Sciences: Demography, Sociology, Economics
- I.3. Sources of Population Data: Census, Vital Statistics, Sample Survey, Dual Report System,
Population Registers and International Publications

MODULE II THEORIES OF POPULATION

- II.1. Malthusian Theory
- II.2. Optimum Population Theory
- II.3. Demographic Transition Theory

MODULE III STRUCTURE, CHARACTERISTICS AND DYNAMICS OF POPULATION

- III.1. Population Structure and Characteristics: Sex and Age Characteristics, Marital
Status, Education, Occupation and Religion
- III.2. Fertility: Biological, Cultural and Social Factors of Fertility, Measures of Fertility
- III.3. Mortality: Factors of Mortality, Measures of Mortality
- III.4. Migration: Types of Migration- Internal and International

MODULE IV POPULATION GROWTH, DEVELOPMENT, POLICIES AND PROGRAMMES

IV.1. Population Growth in India with Special focus on Kerala -Education, Health,

Socio economic development

IV.2. Population Policies: Mortality, Fertility and Migration influencing Policies,

Anti-Natalist Policies

IV.3. Family Planning and Welfare Programmes

Reference

Asha Bhende And Tara Kanitkar: Principles Of Population Studies ,Himalayan Publishing House,Bombay ,1996

Ashish Bose: Indian Population

Thompson and Lewis: Population Problems

M.L.Jhingan , B.K.Bhatt, J.N Desai: Demography

Agarwal S.N: India's Population Problems

Bose A : Patterns Of Population Change In India

Clarke J.I: Population Geography

Mandelbaum D.G: Human Fertility In India

Srivastava S.C: Studies In Demography

Mamoria C.B: India's Population Problems

ELECTIVE COURSE

SOC6 E.01 SOCIOLOGY OF DEVELOPMENT

No: of credits: 4

Objectives

1. To familiarise the student with the concept of development.
2. To provide theoretical explanation of development
3. To understand the development experience of Kerala

MODULE II THEORIES OF DEVELOPMENT

II.1. Modernisation Theory

II.2. Dependency Theory: Immanuel Wallerstein

II.3. World System Theory: Sameer Ameen

II.4. Unequal Union development

MODULE III DEVELOPMENT EXPERIENCES IN INDIA AND KERALA

III.1 Five Year Plans, Microfinance Institutions

III.2 Community Development Programmes, Panchayathi Raj System

III.3 People's Planning Programme in Kerala

III.4 A critical evaluation of people's planning programme

References

Thomas Issac & Richard W Franke – Local Development and Planning

Katar Singh - Rural Development, Principles Policies & Management, New Delhi, Sage

Dunn Edgar. S. (1971) Economic and Social Development, A process of Social Learning,
Baltimore the John Hopkins Uty. Press

Dube S.C.(1988) - Modernisation and development

Salunkhe. S.A. (2003) - The Concept of Sustainable Development (Root Construction & Critical
Evaluation, Social Change)

SYLLABUS OF OPEN COURSES OFFERED BY SOCIOLOGY

SOC5 D.01 LIFE SKILL EDUCATION

No of credits: 2

Objectives

1. To provide with the knowledge of necessary life skill for the application in everyday life
2. To enhance the quality of addressing issue relevant to the life situations
3. To enable the students to establish productive interpersonal relationships with others
4. To equip students for handling specific issues

MODULE I INTRODUCTION TO LIFE SKILL EDUCATION

- I. 1 .Definition of Life skills, Components of life skills, Need for Life skill training
- I. 2 .Life Skill a Life Course approach: (a) critical thinking skills / decision making skills
(b) interpersonal/ communication skills (c) coping and self management skills.

MODULE II COMMUNICATION SKILLS.

- II.1. Communication: Definition, Types, Components -Verbal and Non Verbal Communication.
- II.2. Effective interpersonal communication
- II.3. Person to group communication: Public Speaking, Interview facing and Group Discussion

MODULE III CAREER PLANNING

- III.1.Choosing a Career, Career Planning, Need and importance of Career Guidance
- III.2 .Career Guidance Centres, Sources of career information: Job Fair, Career Magazines,
Computerised job Search
- III.3. Applying for a Job: Preparation of Resume, Follow up communication

Reference

- Elizabeth Hurlock (1968), Development Psychology, Mc Grew Hill
- Baron A Robert and Byrne Donn (2003), Social Psychology, Prentice Hall of India
- Delors, Jacques (1997), Learning: the Treasure Within, UNESCO , Paris
- UNESCO and Indian national Commission of Co operation with UNESCO (2001), Life Skill
in Non formal education A Review, UNESCO , Paris
- WHO (1999), Partners in Life Skill Education: Conclusions form a UN Inter Agency
Meeting, WHO , Geneva
- Pathanki, Dhum (2005), Education in Human Sexuality: a Source Book for education, FPA
India and IPPF, Mumbai
- Swathi Y Bhav (ed) (2006), Bhav's Text Book of Adolescent Medicine, Jaypee Brothers
medical Publishers , New Delhi
- MKC Nair , et al (ed)(2001), Family life education and AIDS Awareness training Manual for
Minus two to plus two

Pauline.M. Kolenda- Religion, Caste and Family Structure

Shah.A.B.- Tradition and Modernity in India

COMPLEMENTARY COURSE

SOC3 C.03 SOCIAL PSYCHOLOGY

Number of Credits: 2

Objectives

1. To provide an understanding of basic concepts in social psychology
2. To provide basic understanding on social behaviour
3. To provide basic understanding on personality and its relation with social system

MODULE 1 SOCIAL BEHAVIOUR

- I.1. Definition, Nature, Subject Matter And Scope Of Social Psychology,
Methods of Studying Social Psychology, Importance of the study
- I.2 .Groups: Definition, Types- Primary and Secondary Groups,
Social Interaction, Social and Inter Personal Relations.
- I.3. Crowd, Audience and Rumor: Definition Characteristics and
Classification of Crowd and Audience
- I.4. Leadership: Definition of leader and leadership, Characteristics,
Types, Emergence of Leadership in a Group

MODULE II PERSONALITY AND SOCIAL SYSTEM

- II.1. Attitude : Meaning, Types and Formation of Attitude
- II.2. Social Learning : Meaning and Definition, Factors in The Process Of Learning
- II.3. Personality : Definition and Factors Affecting Personality,
Social Factors Influencing Personality,

Reference

David Krech & Richard S Crutchfield : Theory And Problems of Social Psychology

Kuppuswamy B : Elements Of Social Psychology

Shaw M.E & Costanso P.R : Theories Of Social Psychology

Sheriff M & Sherriff C.M : Social Psychology

Lind Gren H.C : An Introduction to Social Psychology

Cooper.B.Joseph&James.L.McGaugh : Integrating Principles of Social Psychology

Douglas T Kenrick : Social Psychology

Steven L Neuberg,Robert B Cialdini : Social Psychology Unraveling the Mystery

Sharon.S.Brehm,Saul.M.Kassin,Steven Fein : Social Psychology

COMPLEMENTARY COURSE

SOC4 C.04 POLITICAL SOCIOLOGY

No of Credits: 2

Objectives

1. To understand critically the fields of political sociology
2. To understand the role of political socialization
3. To acquire knowledge about the current political scenario of India

MODULE I INTRODUCTION TO POLITICAL SOCIOLOGY

I.1. Definition, Subject matter, Importance and problems of Political sociology. Relationship with Political Science

MODULE II POLITICAL SOCIALIZATION AND POLITICAL PROCESSES

- II. 1. Political socialization, Meaning, Types, Means and Determinants of political participation
- II.2. Politicization of caste, Role of Pressure tactics, Communal organizations, Role of Mass media.
- II.3. Public Opinion, Interrelation between politics and society, Politicization in Public life

References

1. Harold A Gould, Politics and caste, Chanakya Publications
2. R T Jingham, Text Book of Political Sociology, OUP
3. Ali Asaraf & L N Sharma, Political Sociology, University Press Pvt Ltd, Hyderabad

- Haralambos - Themes and Perspectives
- Bhatnagar,G.S - Education and Social Change
- Brookover,W.B.& Gottlieb,D - A Sociology of Education
- Brown,F.J - Educational Sociology
- Chesler,M.A.
- & Cave,W.M. - A Sociology of Education: Access to Power and Privilege
- Cook,L.A & Cook,E.F - A Sociological Approach to Education
- Friere.P. - Pedagogy of the Oppressed
- Illich.I - Deschooling Society
- Mathur,S.S - A Sociological Approach to Indian Education

SEMESTER IV

ELECTIVE COURSE

NO. OF CREDITS: 4

SOC4 E 09 GUIDANCE AND COUNSELING

Objectives

- To provide a basic understanding about guidance and counseling
- To create awareness of the different techniques and the process of counseling
- To familiarise with the areas of counseling
- To recognize the significance of counseling in contemporary society

MODULE 1 INTRODUCTION

1.1 Counseling: Meaning and Definition, Guidance: Meaning and purpose, Difference between guidance and counseling

1.2 Goals of Counseling-immediate and long-term, Relevance of counseling

1.3 Types of counseling: Crisis counseling, Facilitative counseling, preventive counseling,

Development counseling, Group Counseling

MODULE 2 PROCESS AND TECHNIQUES OF COUNSELING

2.1 Counseling process, Preparation for Counseling, Proceeding of Counseling, Follow up

2.2 Variables affecting Counseling process, Counselor-counselee relationship

2.3 Techniques of Counseling: observation, listening, responding, non-verbal

Behavior , communication, questioning, silence, transference.

MODULE 3 AREAS OF COUNSELING

3.1 Family and marital Counseling,

3.2 Educational and vocational Counseling,

3.3 De-addiction Counseling.

MODULE 4 MODERN TRENDS IN COUNSELING

4.1 Problem solving-role of Voluntary and non- Voluntary agencies

4.2 Transactional analysis

4.3 Rational emotional therapy

Reference

Henry Clay Lindgren - An Introduction to Social Psychology(2nd Ed)

Guidance and Counselling - Sister Mary Vishala

Gladding, S.T. - Counseling: A comprehensive profession

Bhatnagar, Asha and Gupta, Nirmala (Eds.) - Guidance and Counselling: A practical Approach

Sharma, R.N. & Rachana Sharma - Guidance and Counselling in India

Nayak, A.K. - Guidance and Counselling.

Gibson, R.L. and Mitchell, M.H. - Introduction to Guidance

Course Code	Title	Type	Credit
HIS 1A 01	Personality Development	Audit	4

Ability Enhancement Course (AEC)

Paper I: PERSONALITY DEVELOPMENT

Module – I: Image Building and Self Awareness

Aptitude and personality assessment and testing - Developing Self Awareness - Projecting a winning personality - How to match the peer group expectations as a professional - How to be a consistent Performer - Power of Positive thinking - Developing Competitive coping Mechanism - Understanding Professional Etiquette - Professional Mannerism and Social Science Professional

Module – II: How to face an Interview

Motivation activities, leadership activities, team building activities, assertiveness activities, time management techniques - Stress management techniques, creativity and ideation - Basic communication skills- listening skills and barriers; JAM sessions, debates, elocution, etc. - persuasive communication, convincing Skills, conversations - Motivation – Developing Soft skills - Personal grooming - preparation for interview – Resume writing - Types, contents, formats - Interview handling - do's and don'ts

Module – III: Professional Etiquettes

Formal Look – Understanding the demands of the profession - get together Peer to Peer communication - Work ethics - Hierarchy communication - Handling complaints and grapevine - Developing professionalism - Developing and maintaining social contacts

Reference

- Barun K. Mitra, Personality Development and Soft skills, OUP, New Delhi, 2016.
 Nidhi Tibrewal, Discover Yourself, Partridge India, 2016
 Stephen R. Covey, The 7 Habits of Highly Effective People, Free Press, 1989
 Gopika Kumar, Personal Power Equation, Adhyyan Books, 2018.

Course Code	Title	Type	Credit
HIS 2C02	History of Modern Kerala: Problems and Perspectives	Core	5

HIS 2C02 - History of Modern Kerala: Problems and Perspectives

I. Colonial and modern historiography

Early Surveys and Administrators- Buchanan - Missionary Writings – Samuel Matteer and Gundert- Gazetteers and Manuals- William Logan, Nagam Aiya and Velu Pillai- search for Primary sources – Babington, Bruce Foot- colonial ethnography – Edgar Thurston and L K Anantha Krishna Aiyar. Histories of princely states – Travancore and cochin-Emergence of modern Historiography- K P Padmanabha Menon – imagination of historical past of Kerala by the social reformers and nationalists- development of scientific histories- emerging trends in history writings in Kerala- ecology and environmental histories – women and gender history – Dalit subaltern history- peasant history-history of caste slavery- history of communities - local history- intersectional histories – critical histories.

II. Modern Kerala and the phases of change

Kerala in the 18th century -changes in the economy and society -Mysorean rule in administration and land relations - colonialism in Kerala- from trade to conquest- changes in property and legality - governance and administrative practices- missionary activism in social life - changes in agriculture- industry and social classes-formation of public sphere.

III. Social modernization and reform process

Caste and social reform-religious reform- the idea of ‘Renaissance’ – lower caste protests and the radical agenda in the reform process- social reformers and their positions and strategies-- notions of historical past by reformers- Poykayil Appachan and Chattampi swamikal - Literature and social imaginations -novel as historical knowledge- Indulekha and Saraswathi Vijayam

IV. Formation of united Kerala

National movement and radical politics -popular movements –formation of united Kerala- land reform and its consequences- land reform and landlessness among the Adivasis and Dalits- development experiences- literacy and health care- socio-economic inequality and Kerala model development.

Readings:

A P Ibrahim Kunju, Mappila Muslims of Kerala.

A P Ibrahim Kunju, Mysore Kerala Relations in 18th Century

A Sreedhara Menon, A Survey of Kerala History, DC Books, Kottayam.

A Sreedhara Menon, Makers of Modern Kerala

Adrain C Mayer, Land and Society in Malabar.

Andalat, Rekha illatha Charithram,

Ashin Dasgupta, Malabar in Asian Trade

B Shobhanan, S Ramachandran Nair and K J John, History of freedom Movement in Kerala

C Balan, Reflections on Malabar, NAS College Kanhangad, 2000.

C Kesavan, Jivitha samaram

Charles Dias, [ed], Kerala Spectrum: Aspects of Cultural Inheritance, Indo-Portuguese Cultural Institute, Cochi, 2006.

Dilip M Menon, Caste Nationalism and Communism in South India

Dilip M Menon, The Blindness of Insight: Essays on Caste in Modern India, Navayana, New Delhi 2006.

Donald Herring, Land to the Tiller: The Political Economy of Agrarian Reform in South Asia, Yale University Press, 1983.

E K G Nambiar, Agrarian India Problems and Perspectives, Association for Peasant Studies University of Calicut, 1999.

E M S Nampoothiripad, Keralam Malayalikalute Mathrubhumi [1948] Chintha Publishers, Thiruvananthapuram 2016.

Elamkulam Kunjan Pillai, Ilamkulam Kunjanpillayute therenjoduth krithikal, N Sam [ed], International Center for Kerala Studies University of Kerala, Thiruvananthapuram, 2005.

G Arunima, There Comes Papa: Colonialism and the Transformation of Matriliney in Kerala, Malabar, c. 1850-1940, Orient BlackSwan, 2003.

George K Lietaen, The First Communist Ministry in Kerala

George Mathew, Communal Road to Secular Kerala

Govindan Parayil, Kerala The Development Experience: Reflections on Sustainability and Replicability, Zed Books, 2000.

J Devika, Engendering Individuals: The Language of Re-Forming in Twentieth Century Keralam, Orient Longman, 2007.

K Gopalankutty, Malabar Padanangal

Course Code	Title	Type	Credit
HIS 2C03	State and Society in Medieval India	Core	5

HIS 2C03 - State and Society in Medieval India

Module I: Historiographical Understanding of the Medieval India

Medieval in Colonial perspectives- stereotypical constructs- myth of hostile religions- equating religion and State- 'Islamic State'- representation of [despotic] State, [closed] economy and [stagnant] society ; Nationalist Writings- response to colonial writers- approval of colonial stereotypes- Nationalistic enthusiasm; Marxist Understanding- Perspectival changes- challenging the colonial and nationalist approach- focus to economic aspects - periodization- factors and relations of production –Land and property rights .

Module II: State and Economy in Medieval India

Concept of state in medieval India- theories- imperial polities in medieval India (Turkish, Afghan & Mughal)- Sultan- nobility & Ulema- structure of administration: iqta, mansab, jagir- Revenue administration- mode of Assessments- batai, Zabt, Dahsala, Kankut etc.

Nature of Mughal State- Debate; Decline of Mughal State- Theories

South Indian Polity- nature-Debate

Regional Powers: Rajputs- Marathas- Bahmini- Aspects of State

Local administration: administrative divisions- local ruling classes (chieftains, zamindars and village oligarchies)- Village community- Balutadars, ayagars etc.

Process of Production and Exchange: Agriculture- Industry- Shipping -Trade- types- Local, Overland, Overseas- Exports- imports- Ports- Markets- Urbanization.

Module III: Religion and Social stratification in Medieval India

Islam- spread- growth- theories-popular Islam-Sufism- syncretic culture.

Guru Nanak and Sikhism- Ideals- spread

social stratification-Caste- purity/ pollution-caste oppression- practice of untouchability- influence of Islam- Bhakthi movement- Saint Poets- Shaivism- Vaishnavism.

Position of women- Domestication- Involvement in Production process.

Module IV: Science Technology and Culture

Scientific Inventions- Mathematics- astronomy- medicine- Technological advancement –
Literary contributions- Persian, Sanskrit and regional languages- Encounters of Cultures-
Architecture and Painting-

Reading List

Mohammed Habib, *Studies in Medieval Indian Polity and Culture, The Delhi Sultanat and its Times*, [edited by Irfan Habib], OUP, 2016.

Irfan Habib, *Medieval India. The Study of a Civilization*, NBT , 2008.

-----, *Agrarian System of Mughal India, 1556-1707*, OUP, New Delhi, 2000(1963)

-----, *Essays in Indian History*, Tulika, New Delhi, 1995

-----, *Technology in Medieval India, 650-1750*, Tulika, New Delhi, 2016 (2008).

-----, *Interpreting Indian History*, NEHU Publishing, Shillong.

Satish Chandra, *History of Medieval India*, 2007.

-----, *Essays on Medieval Indian History* , OUP, 2003

Jackson, *The Delhi Sultanate, A Political and Military History*, CUP, 1999

Sunil Kumar, *Emergence of Delhi Sultanate, AD1198-1286*, Permanent Black, 2010.

J.F.Richards, *The Mughal Empire*, CUP, 2016

Stewart Gordon, *The Marathas*, CUP, 1998

Stephen P Blake, *Shajahanabad, the Sovereign City in Mughal india, 1639-1739*, CUP, New Delhi, 1993

Nurul Hasan, *Religion, State and Society in Medieval India*, 2005

Ibn Hasan, *Central Structure of the Mughal Empire*, Munshiram Manoharlal, 1936

R.M. Eaton ed., *India's Islamic Traditions, 711-1750*, OUP, 2006

Harbans Mukhia, *Mughals of India*, Wiley-Blackwell, 2004

Muzaffar Alam & Subrahmanyam, eds., *The Mughal State*, OUP, 2000

Herman Kulke ed., *The State in India 1000-1700*, OUP, 1995

Inversion of square matrices of not more than 3rd order - Solving system of simultaneous linear equations.

15 Hours

Module II

Theory of Equations: Meaning - types of equations - Simple linear and Simultaneous equations (only two variables) eliminations and substitution method only - Quadratic equation factorization and formula method ($ax^2 + bx + c = 0$ form only) - Problems on business applications.

10 Hours

Module III

Progressions: Arithmetic Progressions - Finding the 'n'th term of an AP and also sum to 'n' terms of an AP - Insertion of Arithmetic means in given terms of AP and representation of AP - Geometric Progression: Finding 'n'th term of GP - Insertion of GMs in given GP and also representation of GP - Mathematics of Finance - Simple and compound interest (Simple problems only).

15 Hours

Module IV

Meaning and Definition of Statistics - Scope and limitations - Statistical enquiries - Scope of the problem - Methods to be employed - Types of enquiries - Presentation of data by Diagrammatic and Graphical Method - Formation of Frequency Distribution.

10 Hours

Module V

Measures of Central Tendency - Arithmetic Mean - Median - Mode - Geometric and Harmonic Mean - Measures of variation and standard, mean and quartile deviations - Skewness and Kurtosis - Lorenz curve. Analysis of Time Series: Methods of measuring - Trend and Seasonal variations - Index number - Unweighted indices - Consumer price and cost of living indices.

10 Hours

Reference Books:

1. Sundaresan and Jayaseelan - An Introduction to Business Mathematics and Statistical Methods.
2. Dr. A K Arte & R V Prabhakar - A Text Book of Business Mathematics.
3. Sanchethi and Kapoor- Business Mathematics.
4. Gupta S.P- Statistical Methods
5. Navaneethan P- Business Mathematics
6. R.S.N. Pillai, Mrs. Bhagavathi - Statistics
7. P.R. Vittal - Business Mathematics and Statistics.

SDC2BF05—ORGANISATIONAL BEHAVIOUR AND COMMUNICATION

Semester : II

Credits: 4

Internal: 20, External: 80

Hours: 60

Learning objectives:

- be able to understand and analyze the individual needs, feelings, aspirations;
- develop skills needed to plan for the implementation of change in an organization;
- Identify and develop effective motivational and leadership skills.

Module-I

Introduction

Definition & Meaning, Why to study OB, An OB model, New challenges for OB Manager LEARNING: Nature of learning, How learning occurs, Learning & OB Case Study Analysis

10 Hours

Module-II

Personality:

Meaning & Definition, Determinants of Personality, Personality Traits, Personality & OB, Perception: Meaning & Definition, Perceptual process, Importance of Perception in OB - Motivation: Nature & Importance, Herzberg's Two Factor theory, Maslow's Need Hierarchy theory, Alderfer's ERG theory Case Study Analysis

10 Hours

Module-III

Communication:

Importance, Types, Barriers to communication, Communication as a tool for improving Interpersonal Effectiveness, Groups in organization : Nature, Types, Why do people join groups, Group Cohesiveness & Group Decision Making- managerial Implications, Effective Team Building, Leadership : Leadership & management, Theories of leadership- Trait theory, Behavioural Theory, Contingency Theory, Leadership & Followership, How to be an Effective Leader - conflict: Nature of Conflict & Conflict Resolution, transactional Analysis : An Introduction to Transactional Analysis Case Study Analysis

20 Hours

Module-IV

Organisational Culture

: Meaning & Definition, Culture & Organisational Effectiveness, Human resource Management: Introduction to HRM, Selection, Orientation, Training & Development, Performance Appraisal, Incentives

10 hours

Module - V

Organizational Change

Importance of Change, Planned Change & OB Techniques, International OB : An Introduction to Individual & Interpersonal Behaviour in Global Perspectives.

10 Hours

Suggested Readings:

1. Steven McShane & Van Glinar, "Organizational Behavior", Tata McGraw Hill Publishing Co.
2. Stephen Robbins, "Organizational Behavior". Prentice Hall India Pvt. Ltd New Delhi.
3. Fred Luthans, "Organizational Behavior". McGraw Hill Book Company.
4. Kavita Sharma, "Organizational Behavior", Pearson India.
5. Ricky Griffin & Georgy Moorehead, "Organizational Behavior", Hough Co. Boston.

SDC2BF06

COST ACCOUNTING

Semester : II

Credits: 5

Internal: 20, External: 80

Hours: 75

Objectives:

- > To familiarize the students with the various concepts and elements of cost.
- > To create cost consciousness among the students.

Semester : III
Credits : 4

Total Hours : 60
Course Code : SDC2BF10

Objectives:

- This course is designed to help students get a sound understanding of the business of life, insurance and key operational aspects of the same.

Module I

Definition, characteristics, need & importance/Advantages of insurance
Introduction to the Principles of Life Insurance
Principle of utmost Good Faith/Insurable Interest/Principle of Indemnity

10 Hours

Module II

Premium and Bonuses
What is Premium/Premium calculation and Actuarial valuation/What is Bonus
Creditors rights in life insurance

10 Hours

Module III

Life Insurance Product
Traditional / Unit Linked Policies; Individual and Group Policies
With Profit and Without Profit/Whole Life Products, Interest sensitive product
Term Assurance/Annuities, Endowment Assurance etc.

10Hours

Module IV

Underwriting
Introduction/Classification of Risks/Financial Underwriting
Insurance Documents
Policy Conditions
Claims
Group Insurance
Life Insurance Marketing

15 Hours

Module V

Economic basis of life and health insurance, Demand for and supply of life and health insurance, Factors which influence the supply side of life insurance, The production of life and health insurance, Benefits derived by society through insurance, Costs of insurance to society, Scope of coverage of risks, How much insurance does a man need?,

15 HOU

Reading Lists & References:

Essential Reading: Stratadigm Workbook developed for the B.Voc. program
Suggested Reading: IRDA Publications

Books,USA

5. C Jeevanandam: " Foreign exchange, Concepts, practices & control", Sultan Chand &sons.

SDC4AT16 (E2) RISK MANAGEMENT AND INSURANCE

Lecture Hours per week: 5

Internal: 20, External: 80

Credits: 5

Total Hours : 75

Course Objectives:

- To enable the students to understand risk, risk management process and techniques.
- To help the students to learn about risk financing.
- To understand risk management applications.

Course Details:

Module I : Risk: Meaning of risk - Degrees of risk - Cost of risk - Various elements of cost of risk - Sources of risk - Types of risk - Pure risk and speculative risk - Acceptable and non acceptable risks – Static and dynamic risk

15 Hours

Module II : Risk management - Characteristics of risk management - Significance - Principles of risk management - Objectives - Risk and risk management process – Risk identification - Evaluation - Risk management techniques -Selecting and implementing risk management techniques - Risk Management Information System - Organisation of risk management in business - Methods of risk management - Identification, measurement and control of risk - Evaluation, frequency and severity of losses - Pooling of risk - Insurance as risk pooling arrangements - Transferring of risks.

20 Hours

Module III : Commercial Risk Management Applications - Property - Liability - Commercial property insurance -Different policies and contracts - Business liability and risk management insurance - Workers' compensation and risk financing.

15 Hours

Module IV : Risk Management Applications - Loss of life - Loss of health - Retirement planning and annuities - Employee benefits - Financial and estate planning.

10 Hours

Module V : Risk Management Environment - Industry - Functions and organisation of insurers – Government regulation of insurance sector - IRDA - Privatisation of insurance business in India - Changes in Insurance Act - Insurance intermediaries - Insurance products pricing -Claim valuation – Foreign insurers in India.

15 Hours

Reference Books:

1. Rejda, George E: Principles of Risk Management and Insurance, Latest Edn, Addison Wesley Longm
2. McNamara: Principles of Risk Management and Insurance, Addison – Wesley
3. Dorfman: Introduction to Risk Management and Insurance, Prentice Hall.
4. Williams: Heins, Risk Management and Insurance, McGraw Hill Pub.
5. James S.Trieschman, Sandra G. Gustavsonh, Robert E. Hoyt: Risk management and Insurance, Thomson Asia Pvt. Ltd., Singapore.