STATE ELIGIBILITY TEST

SYLLABUS

LBS
Centre for Science and Technology
(A Government of Kerala Undertaking)
Palayam, Nandavanam, Thiruvananthapuram
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*State Eligibility Test - Syllabus 2016* .................................................................
Paper I
General Knowledge and Teaching Aptitude

Unit I
General Studies

Module 1.
• General Science - Mathematics, Statistics, Physics, Chemistry and Biology (Basics - Class X Level)

Module 2.
• Social Science - Economics, History, Geography and Indian Polity (Basics - Class X Level)

Module 3.
• Humanities - Literature (Classics and Masterpieces of World and Indian Literature), Art (Major art forms of India) and Culture (Life and Society in India)

Module 4.
• Kerala Studies - Social reforms, National Movements, Kerala Model of Development, Literature, Art and Culture

Unit II
Language and Reasoning

Module 1.
• Comprehension and Vocabulary

Module 2.
• Basic English Grammar

Module 3.
• Logical Reasoning and Analytical Ability

Module 4.
• Numeracy Skills - Pattern Recognition and Orders of Magnitude

Unit III
Current Affairs

Module 1.
• Technology - Inventions, Innovations and Discoveries

Module 2.
• Environmental Issues, Movements, Treaties and Legislations - National and International

Module 3.
• UN and Global Affairs

Module 4.
• Institutions of Higher Learning and Research, Scholarships and New Initiatives (National and State level)

Module 5.
• Indian Constitution and Politics and Recent Legislations - Right to Information and Right to Education

Module 6.
• Events, Persons and Awards

Module 7.
• Sports and Games

Module 8.
• Culture (Films, Literature, Music and Performing Arts)

Unit IV
Foundations of education

Module 1. Philosophical Foundations
• Educational Philosophy - Relationship between Philosophy and Education - Major Philosophical divisions and its impact on aims, curriculum, and methods of teaching - Concept of teacher, freedom and Discipline

• Major philosophical systems in the East - Six Schools of Indian philosophy, Buddhism, Jainism, and Islamic thought

• Major philosophical systems in the West - Idealism, Naturalism, Pragmatism, Humanism and Realism, Democracy and Critical Pedagogy
• Eminent thinkers in Education – Gandhiji, Tagore, Vivekananda, Plato, Rousseau, Montessori, Frobel, John Dewey, Paulo Freire
• Value education – Classification of values, Significance of value education, Religious and moral education and development of values, Value crisis.

**Module 2. Sociological Foundations**
• Social functions of education- Various functions of education in society, functions of society towards education. Functions of education with regard to Culture-Preservation, Transformation and Transmission.
• Social change and education - Social Change – Factors influencing social changes- Role of Education. Social mobility. Factors hinder positive changes in the society, Characteristics of Indian Society -class, religion, ethnicity, language. Major changes occurred in Indian society Corruption, Terrorism, Antinational activities, Violence against women, Drug abuse and Alcoholism etc. Role of education to curb Social evils.
• Education and social institutions - Major social institutions, Role of various social institutions to inculcate values connected with Democracy and Secularism, National Integration, Concept of global village
• Education and socialization – Factors influencing socialization, education and socialization process, Acculturation, value orientation- Teacher as a Change agent and Nation builder, Cultural lag, cultural inertia, Cultural diffusion

**Module 3. Psychological Foundations –**
• Educational Psychology- Meaning, scope, fields of psychology- Educational Psychology, School Psychology, Clinical Psychology. Applications of Psychology-
• Guidance and Counselling, life skills education etc.
• Personality- Approaches- Psychoanalytic, Behaviouristic, Humanistic, Trait approaches. Motivation- Intrinsic and extrinsic. Approaches to motivation- behavioral, humanistic, cognitive, and socio-cultural.
• Intelligence- Factor theories, Multiple intelligence. Measurement of intelligence-Binet, Wechsler. Creativity
• Social and Cognitive development- Erikson, Piaget, Vygotsky, Language- structure and development. Memory and forgetting
• Adolescent characteristics- Cognitive, Emotional and Motivational aspects. Peer influence. Parenting difficulties

**Module 4. History & policies of Education**
• History of Education in Kerala and India. Early education history of India, introduction of modern English Education, Government’s role in pre-Independence India, major reports & documents on education. Important personalities in Education in India and Kerala.
• Reports and Policies on Education in post independence period – NPE -first, second & third, BPEGEL, IEDSS
• Acts and Bills Relevant to higher education: Major Bills and Acts on Higher education promulgated by the Parliament of India and the Legislative Assembly of Kerala
• Programmes for Universalisation of Education - Saakshar Bharat, RTE, DPEP, SSA, RMSA, RUSA ,
• Institutions of Education at National and state level- MHRD, UGC, NCTE NCERT, NUEPA, SCERT, DIET, CTE, SIET, etc.

**Unit V**

**Teaching, Learning and Evaluation**

**Module 1. Teaching Aptitude**
• Teaching aptitude – Teacher characteristics, Teaching as a profession, Skill based
theoretical knowledge, Teacher competency and teacher accountability,
• Administrative aptitude – Administrative models, administrative roles of teachers, obligations to students, parents and society
• Reflective practices – components in reflective practice, innovative teaching, mechanisms of feedback to learners, self assessment.
• Professional development – Needs for professional development, technological advancement, professional associations, Pre-service and in-service training, cluster training, teacher rating & grading
• Teacher Characteristics – Essential characters for a quality teacher, professional qualities, teacher as an agent of social reformation.

Module 2. Teaching Methods
• Teaching skills – Essential teaching skills, quality teaching and teaching skills, Microteaching.
• Methods of teaching – Analysis of Major methods of teaching.
• Techniques and approaches to teaching – Individualized instruction, Group instruction, peer teaching, mentoring, facilitated instruction, Distance and online teaching.
• Instructional models of teaching – Significance of Models of teaching – Concept attainment, Advance organizer, cognitive growth, group investigation models of teaching.
• Teaching & Learning resources – Classification of Audio-visual aids, Dale’s cone of experience, Community resources, Web resources. Improvisation of aids, Effective use of learning resources

Module 3. Learning –
• Learning theories- Behaviorist theories, cognitive learning, Constructivist view. Classroom learning. Approaches of Vygotsky, Piaget, Gagne, Bruner, Ausubel, & Bloom

• Applications of learning theories- Mastery learning, reinforcement, situated learning, problem-based learning, Building on students’ thinking, activity and constructing knowledge, scaffolding, assisted learning, concept learning, setting learning objectives, etc.
• Learner characteristics- Heredity, personality, intelligence, SES, culture, gender, experience, motivation, goal orientation, cognitive styles, learning styles
• Learning environment- Class room climate, home environment. Teacher’s personality. Individual learning and group learning. Group dynamics. Sociometry
• Learners with special needs - Students with mental retardation, learning disabilities, learning difficulties, behavioral problems, emotional problems; communication, visual and hearing impairments, under achievers. Strategies- inclusive classroom, strategy training. Gifted students

Module 4. Evaluation
• Tools and techniques for evaluation – Paper pencil Tests, Achievement and diagnostic tests, Performance tests, Cumulative records, Rating scale, Observation, Characteristics of a good test
• Continuous Evaluation – Measures for continuous evaluation- Unit test, Assignments, Seminar, Collection, Project, Experiments, Portfolio etc.
• Terminal evaluation – Teacher made tests and standardized tests, Public examination, Type of test items, Entrance examination, Online tests, Interview
• Grading – Principles of grading, types of grading, Absolute grading & relative grading, grading procedure, Merits and demerits of grading
• Feedback and remediation – Feedback to students, feedback to teachers, Institutional mechanism for feedback collection, Remedial measures
Unit VI
Communication, Technology Research and Educational Administration

Module 1. Communication
- Communication and Education – Meaning, concept & scope, Communication as a major life skill, Effective interaction in classrooms.
- Basic principles of communication – Components of communication, Communication cycle, communication process, sources of communication
- Types of communication – Oral, written, interpersonal, Non-verbal communication
- Barriers in communication – Major barriers, Interaction analysis, procedure for analysis
- Classroom application of communication – Communication and effective teaching, meaningful learning, and proper application.

Module 2. Computer and ICT

Module 3. Research in Education –
- Basic aspects of educational research – Meaning & Scope of research in education, Steps in educational research, Uses of statistics in educational research
- Types of research- Historical, Descriptive and Experimental, Quantitative and qualitative
- Methods, Tools & techniques of research – Surveys, Case study, Experimental, Document analysis, Questionnaire, Scales, Interview, Observation.
- Action research – steps in action research, significance of action research at school level
- Reporting of research – steps in writing research report, APA style, Plagiarism, ethics in educational research.

Module 4. Educational Administration
- Planning and administration at national level – National Curriculum Frameworks, National policy on education, Planning commission and education, National pattern of Education system. NUEPA
- Organisational structure of education in the state – Structure of School education, Higher secondary level education, Higher education system, Kerala State Higher Education Council, SIEMAT
- School administration – Role and functions of Head of the institution, school council, subject councils, school parliament, PTA, MPTA, School management committee
- Management & governance - Management of resources at various levels, Provisions for equal educational opportunities (free textbooks, free uniform, mid day meal, etc.), e-governance
- International agencies and education – UN and goals of education in India, Programmes for universal education in tune with international developments in the field of education. Privatization and education at various levels.
01. Anthropology

Unit I
Social and Cultural Anthropology

Module 1. Meaning and scope of social and cultural anthropology
- Social-Cultural Anthropology: Nature, Scope and Subject matter.
- Branches of Anthropology.
- Relation with other Social Sciences – Economics, History, Sociology, Psychology, Archaeology, Linguistics, etc.
- Emerging trends and specializations in Anthropology.
- Uniqueness and Perspectives in Anthropology – Holism and Fieldwork.

Module 2. Basic concepts
- Culture, Society and Community
- Institution, Group and Association
- Social structure and Social Organization
- Status and Role

Module 3. Nature and Configuration of Culture
- Culture- Explicit and Implicit, Structure, Attributes and paradoxes
- Culture Processes- Enculturation, Acculturation, Diffusion, Cultural Pluralism

Module 4. Family
- Concept, definitions, functions and universality; Family and household
- Typology of family - nuclear, joint, extended and others.
- Residence patterns - matrilocal, patrilocal, neolocal, bilocal and others.
- Stages of development of the family
- Joint family system in India; changing trends in family.

Module 5. Marriage
- Possibility of a universal definition.
- Forms and types of marriage.
- Marriage regulations: Incest, Exogamy, Endogamy, Hypergamy and Hypogamy.
- Marriage payments- Dowry and Bride price; Wealth and its relation to marriage stability.
- Mate Selection- Cross cultural perspectives.

Module 6. Kinship
- Concept of Kinship and its place in Social structure.
- Kinship system- Classificatory and Descriptive.
- Rules of descent and residence.
- Kin groups - Lineage, Clan, Phratry, Moiety and Tribe.
- Kinship Behaviour- Joking and avoidance behaviour, Couvade.

02. Arabic

03. Botany

04. Chemistry

05. Commerce

06. Economics

07. English

08. French

09. Gandhian Studies

10. Geography

11. Geology

12. German

13. Hindi

14. History

15. Home Science

16. Islamic History

17. Journalism

18. Kannada

19. Latin

20. Malayalam

21. Mathematics

22. Music

23. Philosophy

24. Physics

25. Political Science

26. Psychology

27. Russian

28. Sanskrit

29. Social Work

30. Sociology

31. Statistics

32. Syriac

33. Tamil

34. Urdu

35. Zoology
• Kinship Terminology - Eskimo, Omaha, Hawaiian, Crow, Iroquois, Sudanese.

Module 7. Political Organization and Social Control
• Types of political organization, Concepts of power, authority and legitimacy.
• Patterns of leadership in simple societies: Band, tribe, age-grade, chieftain, rank-societies.
• Social control: Mechanisms of social control.
• Law and justice in simple societies; Customary and codified law.
• State and Stateless societies: The rise of State.

Module 8. Social Stratification
• Principles and bases. Estate, Class and Caste
• Social stratification and mobility in and outside the caste
• Approaches to the study of social stratification in India - functional and anthropological approach.

Module 9. Religious Organization
• Anthropological approaches to the study of religion: Evolutionary, psychological, and functional.
• Ritual, Myth, Belief: Sacred and profane; sacred complex; religion and life-cycle rituals.
• Forms of religion in tribal and peasant societies: animism, animatism, naturism and totemism.
• Magico-religious functionaries: Priest, shaman, sorcerer, witch.
• Distinction between magic religion and science.

Module 10. Economic Organization
• Tribal, peasant and other economies.
• Ownership and property concepts in simple societies
• Modes of exchange: Reciprocity, Distribution and Redistribution - Kula Ring and Potlatch. Market economy.
• Hunting-gathering, pastoral, shifting cultivation, agricultural and industrial economies.
• Economic change and adaptation in societies.

Unit II - Biological and Archaeological Anthropology

Module 1. Meaning and scope of Biological Anthropology
• Concept, history, development and scope
• Important branches and its relation to other subfields of anthropology and medical sciences

Module 2. Man's place in the animal kingdom
• Principles of taxonomy
• Classification, distribution and features of living non-human primates (functional and adaptation significances)
• Anatomical comparison between human and non-human primates (with reference to erect posture and bipedalism)

Module 3. Introduction to human evolution
• Man as a primate
• Bio-cultural evolution of humans

Module 4. Theories of Organic evolution
• Historical overview of emergence of evolutionary thought
• Lamarckism and Neo-Lamarckism
• Darwinism and Neo Darwinism
• Mendelian laws of heredity
• Modern synthetic theory

Module 5. Emergence of man-fossil evidence
• Pongids and Hominids
• Australopithecines
• Pithecanthropines (Homo erectus)
• Homo sapiens Neanderthalensis
• Homo sapiens sapiens

Module 6. Biological Basis of Life, Heredity and Variation
• Cell structure and functions
• Cell divisions-mitosis and meiosis and genetic significance
• Importance of genetics in evolution and recent developments in human genome

Module 7. Human genetics - basic concepts and principles
• Chromosomes and genes
• Autosomal, dominant, recessive and Co-dominant
Sex linked, sex limited and sex influenced
Multiple alleles and polygenic inheritance
(ABO blood groups, colour blindness, albinism, brachydactyly, Alkaptonuria)

Module 8. Concept of Race, ethnicity and populations
- Racial criteria and major divisions of mankind
- Concept of Racism
- Debate on ethnic groups and ethnicity

Module 9. Biological anthropology in the service of human society
- Family welfare and genetic counseling

Module 10. Applications of Biological anthropology
- In Industry, medico-legal problems, defense services, public health and nutrition

Unit III
Indian Society and Culture

Module 1. Culture, Society and Civilization
- Concepts of culture, society and civilization
- Theories of Civilisation’s Emergence
- Hydraulic theory, Trade Networks theory, Environmental and Social Circumscriptio
  theory, and Religion theory
- Indian culture: tribal, folk, peasant and urban dimensions

Module 2. Hindu religious and philosophical tradition
- Sacred books of India
- Indian social system: Purusharthas and Varnashramadharma
- Varna System, Caste System; Caste Fission, and Caste Fusion;
- Mobility in Caste System

Module 3. Indian Education System
- Evolution of Indian education system: Pre-British, British and Post-independence
- Contemporary educational pattern
- Non-formal education.

Module 4. Composition of Indian Population
- Racial/ethnic elements and demographic composition of Indian population.

- Linguistic diversity and language cultures of India.

Module 5. Social Disabilities
- The Problem of untouchability
- Social Reform Movements
- Sree Narayana Movement

Module 6. Approaches to the study of Indian culture and civilization
- Folk-Urban Continuum
- Little and Great Traditions; Universalisation and Parochialisation

Module 7. Processes of Social Change
- Modernisation, Industrialisation, Urbanisation, Westernisation
- Sanskritisation; Concept of Dominant Caste; Pecuniarisation

Module 8. The Tribes of India
- Major Tribes of India and Tribes of Kerala
- Transformation of Tribes; Theories of transformation: Verrier Elwin to K.S Singh;
  Tribal movements.
- Tribal issues: Forest, land alienation, Indebtedness, Poverty, Illiteracy, Displacement.

Module 9. Aesthetic and Creative Aspects of Indian Culture
- Introduction to aesthetic and creative aspects of Indian culture
- Architecture, Sculpture, Theatre, Folk art, Music, Dance, Indian Cinema

Module 10. Changing Village India
- Changes in Indian Village Communities
- Study of a selected cultural region in India

Unit IV
Methodology of Anthropological Research

Module 1. Science and Scientific Research
- Science, Objectivity, validity, testability
- Relation between theory and fact
- Social science, value, subjectivity, Inter subjective objectivity
Social science research, Ethical, Experimental and Epistemological problems.

Module 2. Construction of Research Design
- Identification of broad area of research
- Review of literature, conceptual framing and concept mapping
- Formulation of research problem
- Hypotheses formulation
- Determination of sample frame and size
- The notion of control
- Construction of tools and techniques of data collection
- Mode of analysis and reporting

Module 3. Fieldwork tradition in anthropology
- Fieldwork tradition in anthropology
- Restudy and Reinterpretation

Module 4. Ethnographic approach in anthropological research
- Features of anthropological fieldwork
- Getting acquainted with the field
- Establishment of rapport
- Learning and using native language
- Informants/key informants
- Ethical dimensions of fieldwork
- Handling of sensitive and confidential information
- Distinction between Fieldwork and Survey
- Ethnography as a holistic documentation of culture

Module 5. Basic Techniques of data collection I
- Interview-structured and non-structured, open ended, focus group interview and key informant interview
- Observation-participant, non-participant and quasi participant
- Genealogy-technique and application, Pedigree

Module 6. Basic Techniques of data collection II
- Questionnaire and Schedule
- Case method
- Personal, official and historical documents and sacred texts.

Module 7. Quantitative analysis: Basic statistics
- Scrutiny and processing of data
- Classification, tabulation and presentation
- Frequency distribution, Graphs and Histograms
- Measures of central tendency, Mean, Mode, Median Measure of variation-Mean deviation and Standard deviation. Inter individual and Instrumental errors

Module 8. Qualitative analysis-Introduction
- Context based analysis
- Grounded theory approach
- Thematic analysis

Module 9. Ethnographic approach in anthropology
- Contributions of Malinowski
- Ethnographic study of Toda of Nilgiris - Nature of data, Interpretation and functional integration

Module 10. Preparation of Anthropological research report
- Structure, Steps and Procedure

Unit V - Method and Theory in Socio-Cultural and Development Anthropology

Module 1. Introduction to Method and Theory
- Anthropological Studies before and after Cultural relativism
- Anthropological thought and Theoretical Development in Anthropology
- Schools of thought
- Relationship between Theory and Method

Module 2. Evolutionism
- Meaning of evolution. Nineteenth century evolutionism and its basic assumptions
- Evolutionary school of thought
- The comparative method as used by the unilinear evolutionists

Module 3. Diffusionism
- Diffusionist School of Thought
- British and German- Austrian diffusionists and their main assumptions
- American distributionists

Module 4. Functionalism
- Malinowski’s contributions to functionalism. Relevance of terms like manifest/ latent function and eufunction and dysfunction
Module 5. Continuum
- Continuum of Robert Redfield and its turning point in anthropological studies

Module 6. Structural Functionalism
- Structural functionalism
- Interrelation of function and structure: Radcliffe-Brown, Firth, Fortes and Nadel

Module 7. Cultural Patterns and Culture and personality
- Ruth Benedicts Theory of Pattern
- Culture and personality: basic personality construct and model personality
- National character studies and studies of culture at a distance

Module 8. Structuralism
- Structuralism in linguistics and in social-cultural anthropology
- Social structure as model: views of Levi-Strauss and Edmund Leach
- Structural analysis of myth and alliance

Module 9. Post-structuralism
- Post-structuralism, Contributions of Jacques Derrida, Michel Foucault
- Ethno-science
- New Ethnography and Componential Analysis

Module 10. Development anthropology and early thoughts on development
- Meaning and scope of Development Anthropology
- Development planning; Agencies or development: Government, Non-government and Voluntary.
- Nehruvian approach to planning and Gandhiji’s vision of rural development
- Constitutional Safeguards and Legislative measures
- Concepts of Inclusion and Exclusion

Unit VI - Ecological, Medical and Economic Anthropology

Module 1. Ecological anthropology
- Meaning and Scope of Ecological anthropology
- Definition of ecology, Ecological community and Human ecological Niche
- Cultural ecology

Module 2. Fundamental concepts and approaches
- Environmental determinism, Environmental Possibilism
- Population ecology, System ecology, Ethnology
- Contribution of Wissler, Forde, Steward, Vayda and Rappaport

Module 3. Medical anthropology
- Meaning and Scope of Medical anthropology
- Concept of health and disease in India-tribal, rural urban; Socio-cultural dimensions of illness.
- Ethnomedicine: Culturally appropriate medicine and health education. Regional variation in India. Magico-religious curative practices and indigenous medical care services

Module 4. Health and Society
- Health care system and Health care services; Health education
- Psycho-somatic and mental disorders

Module 5. Applications of medical anthropology
- Application of anthropological knowledge in promoting health care in tribal and rural communities. Programme, promotion and changing health behavior

Module 6. Economic Anthropology
- Meaning and scope of economic anthropology
- Approaches to economic anthropology

Module 7. Economic theories
- Fundamentals of modern economic theories and their relevance to non-market economies: formalist – substantivist controversy
- Marxist theories on economy and society

Module 8. Habitat, Economy and Society
- Hunting, food gathering
- pastoralism
- Shifting (Sweden) cultivation
- Peasantry and urban-industrial economy

Module 9. Exchange and Service
- Barter, ceremonial exchange, reciprocity, redistribution (Gift, Potlatch, Kula ring)
- Jajmani System
Module 10. Organization of Subsistence production
- Consumption pattern in subsistence economies.
- Wealth status and social differentiation

Module 2. Islamic & Umayyath
- Quran, Hadith, Compilation of Quran & Hadith, Speeches (Aboobakar, Aliyyubin Abuthaliib, Hajaj bin Yusuf Assaqafi, Umar bin Khathab) Nahjul Balagath

Module 3.
- Thafseer and authors (التفسير والمفسرون), Sihah sitha and other Hadith books (التفسير والمفسرون)
- Thabari, Ibn Masudi, Ibn Khalikan (History)
- Gazzali, Al Kindi, Ibn Seena (Philosophy)

Module 4.
- Drama: Tawfiq AlHakeem, Cassan al kanafani
- Short Story: Musthafa Luthfi al manfaloothi, Mahmood Thaymoor, Yahya Haqi, Yusuf Idress, Abdul Khal
- Novel: Najaeb Mehfooz, Najaeb Kelaani, Saud al sarusi
- Essay & Biography: Thaha Hussain, Sayyid Quthub, Aham Ameen, Mahmood Abtas al Aqad
- Journalism: Arabic Newspapers and Magazines, Development of Arabic Journalism & Arab Channels

Module 6. Contemporary Arab World
- Political System, Capital City & Coin
- Kingdom of Saudi Arabia, Qatar, UAE, Egypt, Kuwait, Iraq, Iran, Oman, Bahrain, Libya, Syria, Palestine, Jordan, Morocco, Sudan, Yemen, Algeria

Module 7. Encyclopedic Works in Arabic
- Major resources of Arabic language and literature
- Lexicons

Unit III
Grammar

Module 1. Arabic Grammar- All areas related in Arabic Grammar

Module 2. Rhetorics
- Introduction, Ilm Mal'imi, Ilmul Badee'u, Ilmul Puasaan

Module 3. Prosody
- Fundamental and 16 meters

Module 4. Linguistics
- Development of Linguistics in Arabic and general awareness in Linguistics
Unit IV
Arabic Criticism

Module 1.
- Definition of Literature and Criticism,

Module 2.
- Development of criticism in Pre Islamic, Islamic and Umayyath Period, Nabigailu Dubanyi

Module 3. Abbasid Period
- Ibnul Quithali, Qudamatu bu Jafar, Al Jhalis, Ibnul Sllamul Jumahi,

Module 4.
- Shauqi daif, Thaha Hussain, Sayyid Quthub, Anvarul Jundi

Module 5.
- Appollo Movement, Dewaan movement

Module 6.
- Mahjir Literature, Rabithathul Qalamiiyya, Usbatul Undulasiyya, Rabithathul Adabiiyya, Jubran Khaleel Jubran, Mikhail Nuaima, Eliya Abu Madi, Naseeb Areeda, Mishael Ma'tool

Unit V
Indo Arabic Literature

Module 1. Arabic Literature in India
- Development of Arabic literature in India, Arrival of Islam in India, Important works in Arabic
- Islamic Institutions Sha Valiyulla al-Dahlavi, Abu Hassan Ali Naqvi and Calam Ali Azad Balgami, Anwar Shah Kashmeeri

Module 2. Arabic Literature in Kerala
- Role of Makhdoom Family, Umar Qaazi, Abu Laila, Muhuydeen Aluvayil, N K Ahammed Moulavi

Unit VI
Translation

Module 1. Journal Arabic
- A passage from an Arabic newspaper followed by 5 questions to be answered.

Module 2. Modern Technology
- Match the following questions with Arabic Words related to modern information technology on one side and its translation on other side.

Module 3. Travel and Tourism
- Odd one out (2 questions)
- Select the correct translation (3 questions)

Module 4. Translation (English to Arabic)
- Select the most apt translation of the English phrases below: (English Phrases consisting of at least three words to be given)

Module 4. Translation (Arabic to English)
- Select the most apt translation of the Arabic phrases below: (Arabic Phrases consisting of at least three words to be given)

03. Botany

Unit I
Diversity of Life Forms I

Module 1. Bacteria
- Classification, Ultra structure of cell, flagella, pili, metabolism, growth, reproduction and genetic exchange - transformation, transduction and conjugation

Module 2. Viruses
- Classification, Structure, reproduction. Bacteriophages, lysogenic and lytic cycles. viroids, virions, prions, retroviruses.

Module 3. Phycology
- Classification of algae, General structure, reproduction and life cycle of different groups-Cyanophyceae, Chlorophyceae, Bacillariophyceae, Xanthophyceae, Phaeophyceae, Rhodophyceae. Economic importance of Algae

Module 4. Mycology
- Classification of fungi, General structure, reproduction and life cycle of different groups- Myxomycetes, Zygomycetes, Oomycetes, Ascomycetes, Basidomycetes and Deuteromycetes. Economic importance

Module 5. Lichenology
- Classification, General structure and reproduction, Economic importance
Module 6. Bryology
- Classification, General characters, reproduction and life cycle of different groups- Hepaticopsida, Anthocerotopsida and Bryopsida. Economic importance.

Module 7. Pteridology
- Classification, General characters, reproduction and life cycle of different groups- Psilopsida, Lycopsida, Sphenopsida and Pteropsida, stelar evolution, telome concept Economic importance, Fossil Pteridophytes - Rhynia, Lepidodendron.

Module 8. Gymnosperms
- Classification, General characters, reproduction and life cycle of different groups- Cycadales, Coniferales, Ginkgoales, Gnetales, Fossil Gymnosperms, Economic importance

Unit II
Diversity of Life Forms II

Module 1. Morphology
- Morphological variation in angiosperms with respect to stem, leaf, inflorescence, flower and fruit

Module 2. Taxonomy of Angiosperms

Module 3. Economic Botany
- Study Binomial, family, morphology of useful parts and utility of,
- Cereals and millets (Rice and Maize), Pulses (Soy bean, Cow pea, Green gram), Oil yielding plants (Coconut, Ground nut, Oil palm), Sugar yielding plants (sugar cane, Sweet potato), Spices and condiments (Turmeric, Cinnamomum, Pepper, Nutmeg and Ginger), Fibre (Cotton, Jute), Dye yielding plants (Indigo, Henna, Anatto), Tuber crops (Tapioca, Potato), Gum and resins(Asafotida, White dammar, Gum Arabic), Medicinal plants (Ocimum, Neem, Rauwolfia), Timber yielding Plants (Rose wood, Teak wood, Ailanthus), Narcotics (Opium, Cannabis), Vegetables (Tomato, Brinjal, Cucumber), Rubber (Para rubber)

Module 4. Ethnobotany
- Definition, History and scope of Ethnobotanical studies

Module 5. Histology

Module 6. Microtechnique and Histochemistry
- Killing, Fixing and staining of plant tissues-principles and purposes, Important fixatives and their properties, FAA, Carnoys fluid and Flemmings fluid, Dehydrating agents. Microtome- rotary, sledge, cryotome and ultratome. Different types of stains, Tissue processing techniques for Scanning and transmission electron microscope, Types of micro slide preparations- Temporary, semi-
permanent, permenant- smears and squashes, Methods of embedding plant materials in Paraffin wax – TBA method, Double stained and serial section preparations, Histochemistry and Enzymology- Localization of carbohydrates (PAS) lipids (Sudan Black) and proteins (Coomassie Brilliant Blue), Principle and protocol of Localization of peroxidase

Module 7. Reproductive Biology

- Asexual reproduction-adventive embryony, nonrecurrent apomixis. Diplospory, apospory, parthenogenesis, androgenesis, apomixis; Sexual reproduction - microsporogenesis, male gametophyte-pollen fertility, sterility; Megasporeogenesis, female gametophyte, types; Pollination Biology-Primary and secondary attractants of pollination, ultra-structural and histochemical details of style and stigma, Pollen pistil interaction, Fertilization-barriers, incompatibility and methods to overcome it (intra ovarian pollination and in vitro fertilization, embryo rescue technique; Embryo, endosperm and seed development, polyembryony and parthenocarpy, Recent advances in palynological studies, Pollen allergy, economic importance of pollen, Melissopalynology, role of apiaries in crop improvement

Unit III
Functional Plant Biology
and Analysis Plant Physiology:

Module 1
- Water movements in plants and inorganic nutrition: Diffusion and facilitated diffusion-pressure driven bulk flow, Osmosis driven by water potential gradient, Role of aquaporins, cavitation and embolism, Soil-plant-atmosphere-continuum; physiology of stomatal function.

Module 2. Metabolism

- Respiration: Glycolytic reactions, citric acid cycle, electron transfer system and ATP synthesis. Unique electron transport enzymes of plant mitochondria: external NAD(P)H dehydrogenase, rotenone and cyanide insensitive respiration.

Module 3. Growth, differentiation and development

flowering-phytochrome, cryptochrome and biological clock. Factors affecting flowering: photoperiodism and thermoperiodism. Fruit development and ripening: physiology of ripening- cell wall architecture and softening, enzymes involved in biochemical changes.

- Seed development and germination physiology: deposition of reserves during seed development, desiccation of seeds: hormones involved, desiccation tolerance. Classification of seeds, seed dormancy. Seed germination and reserve mobilization- metabolism of carbohydrates, lipids, proteins and phytins; physiology of seed dormancy.

- Plant growth regulators: Auxins, Gibberellins, Cytokinins, Abscisic acid and Ethylene - biosynthesis, transport, physiological roles, mode of action, commercial uses.

Module 4. Photoreceptors


- Signal transduction. Classes of signals; receptors, signal perception, signal amplification and transduction reactions, role of Ca++ as second messengers, role of Calmodulin.

Module 5. Stress physiology and senescence:


Module 6. Chemical bonds

- Concept of hybridization, bonding in organic molecules, effect of bonding on reactivity, polarity of bonds-bond length-bond angle-

hydrogen bond, dissociation and association constant.

- pH and buffers - Henderson-Hasselbalch equation, pH, pKa, Kw, proton hopping, buffers in living system, common buffers.

Module 7. Carbohydrate

- Specific categories and their properties, metabolism of starch, cellulose and glycogen. Glycolysis, TCA cycle, terminal oxidation, gluconeogenesis, glyoxylate pathway, PPP pathway, glycopolypeptides and proteoglycans, biosynthesis of peptidoglycan, metabolic mill.

Module 8. Amino acids and proteins

- amino acids - classification, properties, optical activity, unusual amino acids, ninhydrin reaction; basics of biosynthesis and breakdown of amino acids, classification and conformation of proteins, Ramachandran plot. Brief account on the biosynthesis of protein.

Module 9. Lipids

- classification, brief account on compound and derived lipids with examples, classification of fatty acids, biosynthesis of fatty acids (microbes, plants and animals), alpha, beta and omega oxidation of fatty acids, omega fatty acid and functional food, trans-fatty acids and their dangers.

Module 10. Nucleic acid

- Biosynthesis and break down of purines and pyrimidines. Enzymes for synthesis and degradation; Vitamins: classification, structure, function and source of vitamins, vitamins as coenzymes

Module 11. Enzymology

- structure, function and classification of enzymes, coenzymes, substrate specificity, regulation of enzyme activity, active sites, inhibitors, allosteric enzymes, kinetics, negative and positive co-operativity, multi-enzyme, isoenzymes, ribozyme, abzyme
Module 12. Energy metabolisms
- Concept of free energy, entropy, enthalpy, chemical equilibria, principles of thermodynamics, thermodynamics of phosphate compounds, thermodynamics of life; thermodynamics, kinetics and mechanisms of membrane transport, energy rich bonds, redox reactions.
- Principles and application of tracer techniques in biology, Radio isotopes, radiation dosimetry, radioactive decay, Cerenkov radiation, radiations and their applications in biology.

Module 13
- Principles and applications of light and electron microscopy, phase contrast, fluorescence, scanning and transmission electron microscopy, cytometery, flow cytometry, micrometry, camera lucida, photomicrography.
- Instrumentation, principles and functioning of: colorimetry and spectrophotometry, atomic absorption spectroscopy, plasma emission spectroscopy, ORD/CD, chromatography (TLC, gel filtration, ion exchange, affinity, GC, GC-MS, HPLC, FPLC), NMR, X-ray crystallography, MRI, tools in nanotechnology (Atomic Force Microscopy, Scanning Tunneling Microscope, Scanning Probe Microscope), Fluorescent Microscopy, Flow cytometry, Liquid scintillation.

Module 14
- Measures of central tendencies- mean, median and mode. Skewness and curtosis. Measures of variations- range, quartile deviation, mean deviation- variance and standard deviation. Standard error and Coefficient of variation; Probability: addition theorem and multiplication theorem, conditional probability; Theoretical distributions: binomial, poisson and Normal; Tests of significance- z, t and $\chi^2$ tests; F-distribution and Analysis of variance; Correlation and regression analysis; Factor analysis.

Unit IV
Molecular Cell Biology and Heredity

Module 1. Cell

Module 2. Organization of genetic material in eukaryotes
- Phases of cell cycle, cell cycle control mechanisms – extracellular and intracellular signals, cell cycle check points – DNA damage check points, centrosome duplication check points, spindle assembly check points, Cell Division –details of mitosis and meiosis, significance. Apoptosis – mechanism and regulation.

Module 3. Cell Cycle
- Structure of chromatin and chromosomes, histones and non-histone proteins, nucleosome structure, chromatin packaging, structure of metaphase chromosome, molecular structure of centromere and telomere, Chromosomal aberrations: Structural and numerical aberrations, Phenotypic effects of chromosomal aberrations, Special types of chromosomes: lamp brush and polytene chromosomes.

Module 4. Cell communication and signaling
- General principles of cell communication, signaling molecules and their receptors, cell surface receptors - ion channel linked.
receptors, G-protein coupled receptors and Tyrosine Kinase Linked receptors, steroid hormone receptors, Signal transduction pathways, second messengers, regulation of signaling pathways

Module 5. Genetic material: structure, replication and repair
- Experiments which proved that DNA is the genetic material, Chargaff’s rule, experiment which proved that DNA replication is semi conservative, Structure of the nitrogen bases, structure of nucleotides, Watson and Crick model of DNA: salient features, alternative forms of DNA, Transposons – types, transposition mechanism; DNA replication (in both prokaryotes and eukaryotes): process, proteins and enzymes involved, end replication problem and the role of telomerases; DNA repair: DNA proof reading, mismatch repair, nucleotide excision repair, base excision repair, direct repair, SOS response and error prone repair

Module 6. Gene expression
- Central dogma of molecular biology, concept of gene, one gene one enzyme hypothesis; Transcription in Prokaryotes: Promoters, RNA polymerase – structure and function, initiation complex, rho dependent and independent termination mechanisms; Transcription in eukaryotes: Promoters, enhancers, and silencers, different types of RNA polymerase and their function, transcription factors – structure and function, elongation factors, termination mechanism; Post transcriptional modification of RNA: Structure, formation and function of 5’ cap and 3’ tail, RNA splicing – types of introns, mechanisms of exon splicing, alternative splicing, exon shuffling, RNA editing; Translation: salient features of mRNA, tRNA and ribosomes (prokaryotic and eukaryotic), SD sequence and Kozak sequence, tRNA charging, process of translation (prokaryotic and eukaryotic), mRNA surveillance; Genetic code: deciphering the genetic code, salient features of the genetic code, exceptions to the Universal code; Protein sorting and trafficking

Module 7. Gene regulation
- Gene regulation: objectives, different levels; Viral gene regulation: gene regulation in lysogenic repression and lytic cascade; Prokaryotic gene regulation: operon – general structure and types, structure and functioning of lac operon and trp operon, attenuation and antitermination; Eukaryotic gene regulation: Changes in chromatin and DNA structure, chromatin remodeling, heterochromatization and DNA methylation, RNA silencing, Epigenetics

Module 8. Principles of inheritance
- Mendel’s experiments and laws of inheritance, monohybrid and dihybrid crosses – phenotypic and genotypic ratios, back cross and test cross, Mendelian traits in man, Extensions of Mendelism, codominance, incomplete dominance, epistasis, complementary interaction of genes, multiple alleles and their inheritance, penetrance and expressivity, cytoplasmic inheritance

Module 9. Linkage and recombination
- Linkage groups, double cross over and interference, two point and three point test crosses, construction of linkage map

Module 10. Population Genetics
- Gene pool, phenotype and genotype frequency, factors affecting gene frequency, Hardy- Weinberg equilibrium

Module 11. Immunology
- Innate and acquired immunity; Humoral and cellular immunity; antigens, epitopes, antigen processing and presentation; activation and differentiation of B cells, role; T cells, types, role; T cell receptors; MHC; monoclonal and polyclonal antibodies, vaccines
Unit V
Ecology and Environment

Module 1. Basic Principles of Ecology
- Basic ecological concepts and approaches – levels of organization – environment, habitat; basic ecological process – biogeochemical cycles, trophic levels, energy flow, ecological pyramids; ecological succession

Module 2. Ecological objects
- Population, community and ecosystems; Population characteristics – distribution, mortality, natality, carrying capacity, population structure and dynamics; geneecology, ecads and ecotypes; Community characteristics – classification of plant communities – Clementsian concepts of climax, Raunkiaer’s system, Vegetation concept of Gleason, Phytosociological methods; Ecosystem characteristics - food chain, food web, ecological niche, biodiversity – genetic, species and ecosystem diversity, alpha, beta and gamma diversity; major ecosystems of the world and their characteristics; Biomes and Biosphere characteristics - ecosystem degradation – deforestation and desertification

Module 3. Environmental Pollution
- Concept of pollution, Environmental quality parameters and standards, different categories of pollution – air, soil and water; air water and soil quality parameters; pollutants – primary and secondary pollutants – heavy metal pollution – biocide residues - biomagnification; prevention and control of pollution and pollution abatement – primary, secondary and tertiary water treatment

Module 4
- Global environmental issues – ozone depletion, acid rains, global warming and climate change – greenhouse gases and emission control – global conventions on carbon dioxide emissions; radiation fallout, noise pollution – occupational hazards

Module 5. Basic principles of conservation and preservation

Module 6. Natural resources

Module 7. Phytogeography

Module 8. Evolution
Unit VI
Applied Botany

Module 1. Biotechnology

- Tissue culture techniques; Explants, culture media, differentiations, micropropagation, meristem culture, callus culture, shoot tip, nodal culture, organogenesis, cell suspension culture, cell line selection, hairy root culture; Somaclonal variation; Somatic embryogenesis- artificial seeds, protoplast culture, somatic hybridization; Haploid production- anther and ovule culture, dihaploids & polyploids, applications; Cryopreservation, Bioreactor technology, cell immobilization, Genomic and organelle DNA isolation, vector mediated and vectorless methods of gene transfer, PCR, restriction digestion, ligation, DNA sequencing, Genomic and cDNA libraries; Analysis and expression of cloned genes
- DNA markers, RFLP, RAPD, ISSR, SSR, SNPs, AFLP, LCR, Genetic engineering; Transgenic biology, allopheny, transformation techniques, gene targeting, RNASi technology
- Microbial biotechnology; Major products of industrial microbiology, compounds use in medicine, health- antibiotics, amino acids, organic acids, vitamins, sex hormones, Bioplymers, biosurfactants, biopesticides; Bioconversion processes- biotransformation, biodegradation and bioleaching; GMO- Bt plants, Herbicidal resistance, viral coat protein, satellite RNA , Flavr savr tomato, golden rice, Biofortification; Social ethical issues IPR, patents, biopiracy and bioregulations

Module 2. Bioinformatics

- Biological databases ; EMBL, GEN BANK, DDBJ, Protein sequence data bases- PIR, SWISS-PROT, Secondary data bases (PROSITE); Protein structure databases (PDB), Data base mining, data bases similarity searches- comparing nucleotide and amino acid sequence – BLAST, FASTA, Sequence analysis- global alignment, local alignment, pairwise analysis, scoring matrices, multiple sequence analysis, phylogenetic analysis, structure analysis tool - RASMOL, Molecular phylogenetic programmes- CLUSTAL, Pharmacogenomics; Application of Bioinformatics Transcriptomics, metabolomics, Pharmacogenomics, Genomics, types, structural and functional, genome annotation, gene finding, single nucleotide polymorphism.

Module 3. Horticulture

- Plant growing structures-Green house, mist chambers, glass house; Plant propagation- seed, vegetative- natural and artificial; Artificial methods of vegetative propagation- cutting, layering, grafting, budding, Cultural practices – thinning, training, trimming and pruning; Commercial horticultural- nurseries, orchards, floriculture, indoor plants, arboriculture- pruning, bracing, transplanting; Bonsai: Principles and procedure

Module 4. Plant Breeding

- Plant introduction, Vavilos centres of origin, genetic erosion, gene bank, NBPGR, selection (Mass and pureline and clonal) hybridization - interspecific and intergeneric
- Incompatibility and crop improvement, Backcross breeding, Inbreeding consequences, idiotype breeding Polyplody breeding; auto and allopolyploid, chromosome addition and substitution, achievements, Mutation breeding; Objectives, procedures, chemical and physical mutations and achievements; Resistance breeding; Principles, methodology- structural, biochemical, physiological and genetic, vertical and horizontal resistance; Seed certification- Plant breeder’s right act, National Biodiversity policy

Module 5. Plant Diseases and Management

- Host parasite interactions, Etiology of the following diseases- False smut of Paddy, Powdery mildew of Rubber, Coffee rust, Red rust of tea, Leaf spot of Mango, Yellow vein...
mosaic of ladies finger, quick wilt of pepper, Defense mechanism- systemic acquired resistance and induced systemic resistance, Quarantine, Plant disease controls-chemical, physical and biocontrol agents

04. Chemistry

Unit I
Inorganic Chemistry

Module 1. Periodicity and Chemistry of Main Group Elements

Module 2. Chemistry of transition and inner transition elements

Module 3. Coordination chemistry

Module 4. Organometallic chemistry
- Types of organometallic compounds, 18 electron rule and Hapticity. Metal carbonyls General properties, nature of bonding, structure and shapes of metal carbonyls of V, Cr, Mn, Fe, Ru, Co, Rh, Ni, metal alkane and alkene complexes, metal sandwich compounds - ferrocene, dibenzene chromium. Fluxional organometallics. Metal carbenes. Metal clusters as catalysts. Applications of organometallic compounds Hydrogenation, hydroformylation, Wacker’s process, Ziegler- Natta catalysis, Monsanto acetic acid process.

Module 5. Bioinorganic chemistry
- Metals and non-metals in biological systems. Metal ion excess and deficiency. Role of alkali- and alkaline earth metal ions in biological systems. Na/K pump. Ca pump. Role of Iron, Copper, Zinc, Manganese,

Unit II
Organic Chemistry

Module 1. Electron displacement effects and Aromaticity
- Electron displacements - Inductive, Electromeric, Mesomeric and Hyper conjugative effects.

Module 2. Reagents and Name Reactions

Module 3. Stereochemistry

Module 4. Photochemistry and Pericyclic Reactions

Module 5. Natural Products and Biomolecules

Unit III
Physical Chemistry

Module 1. Solid, Liquid and Gaseous States
- Crystal systems and lattice types, crystal symmetry. Miller indices-BCC, FCC, HCP,

- Crystal defects: point, line and plane defects.


Module 2. Thermodynamics


Module 3. Chemical Kinetics


Module 4. Electrochemistry


Module 5. Surface Chemistry, Colloids and Catalysis


Unit IV
Theoretical Chemistry

Module 1. Quantum Mechanics

Module 2. Chemical Bonding
Module 3. Molecular Symmetry and Group Theory

Module 4. Molecular Spectroscopy

Module 5. Applications of Spectroscopic Techniques in Chemistry

Unit V
Analytical Chemistry

Module 1. Basic principles in Analytical Chemistry

Module 2. Separation techniques

Module 3. Optical methods of Analysis
- Fundamental laws of Spectrophotometry, Nephelometry, Turbidimetry, Fluorimetry,

Module 4. Electroanalytical methods

Module 5. Thermal- and Radiochemical methods

Unit VI
Selected Topics in Chemistry

Module 1. Green Chemistry

Module 2. Material Chemistry

Module 3. Environmental Chemistry

Module 4. Polymers

Module 5. Medicinal Chemistry
- Drug discovery and design. Classification of Drugs. Physicochemical factors and biological activities. Receptors and drug action. LD_{50} and IC_{50} values. Synthesis of Paracetamol, Phenobarbital, Diazepam, Sulphamethoxazole, Benzyl pencillin, Chloramphenicol.
05. Commerce

Unit I
Management concepts and strategies

Module 1. Basic concepts of management
• development of management taught-scientific management-functional management- Traditional Vs Modern management

Module 2.
• Planning, organizing, staffing, directing, communicating, motivating and controlling-

Module 3. OB
• basic concepts and theories -understanding individual and group behavior -OD.

Module 4. Strategic management
• basic concepts – approaches to strategic decision making – models of strategic management.

Module 5. Strategic planning
• strategic implementation and strategic control system. Michael Porter’s competitive strategies.

Unit II
Business Environment, Policy and MIS

Module 1.
• Macro and micro environment of business-economic, political, technological, social, cultural and trade environment.

Module 2.
• Structure of Indian economy-economic systems- growth pattern of Indian economy-GDP, Per capita Income -economic planning. Problems of Indian economy –poverty, unemployment, regional imbalances-Globalization of Indian economy.

Module 3.
• Government and Business- WTO- World bank- FDI—Forms of trade co operations-

Free trade area, customs union, Common market and economic union.

Module 4.
• Investment policy, Exim policy-liberalization and privatization policy-disinvestment policy-PPP policy.

Module 5.
• MIS basic concepts, system concepts-data processing concept, data base management-System development and implementation.

Unit III
Financial and Corporate Accounting

Module 1.
• Accounting concepts, conventions, and standards. Trial balance, trading and profit and loss account and balance sheet.

Module 2.
• Accounting from in complete records and accounting of non trading firms.

Module 3.
• Company accounts-issue of shares and debentures- valuation good will and shares.

Module 4.
• Company Amalgamation, absorption and reconstruction.

Module 5.
• Accounting standards and reporting.

Unit IV
Quantitative Techniques & Research methods

Module 1.
• Business research need and importance-types of research- steps in research- research designs.

Module 2.
• Problem formulation-setting objectives, hypothesis formulation-scaling techniques-data collection- primary and secondary data, sampling design and sample size decision.
Module 3.
- Data analysis and interpretation- tools, Probability and theoretical distribution-statistical estimation and testing-parametric and non parametric tests.

Module 4.
- Basic concepts of OR and its uses in business decision making.

Module 5.
- Linear programming, transportation and assignment, Net work analysis- CPM and PERT. Statistical decision theory.

Unit V
Financial Management and Marketing

Module 1.
- Basic concepts of financial management-goals of financial management- Traditional Vs Modern goal- scope of financial management-investment decision, financing decision and dividend decision-role of financial manager in modern business.

Module 2.
- Capital investment decision- cash flow estimation- methods of project evaluation, traditional and modern methods. Time value of money- Incorporation of risk in project evaluation.

Module 3.
- Financing decision, capital structure planning-operating and financial leverage-NI approach and NOI approach-optimum capital structure-Determinants of capital structure.

Module 4.
- Cost of capital and dividend policy. Individual components cost and weighted average cost of capital-Value of the firm and dividend policy. Theories of dividend. Basic concepts of working capital management.

Module 5.
- Basic concepts of marketing, need, want, demand, value, satisfaction- Marketing concepts-Marketing planning, implementation and control system. Marketing mix.

Unit VI
Cost and Management Accounting

Module 1.
- Cost accounting basic concepts-elements of cost, materials, labour and overheads. Activity based costing-Unit costing-process costing by product and joint product costing.

Module 2.
- Cost control and cost reduction - methods and techniques-value analysis-value engineering.

Module 3.

Module 4.
- Financial statement analysis-ratio analysis, fund flow and cash flow analysis.

Module 5.
- Marginal costing, breakeven analysis and managerial decisions based on it.

06. Economics

Unit I
Microeconomic Theory and Applications

Module 1. Theory of Consumer Bahaviour
- Theory of consumer behavior - utility functions-demanda analysis-price, income and substitution effects - theory and applications of indifference curves- Hicks and Slutsky effects - revealed preference theory - choice under uncertainty - recent developments in the theory of demand- LES, CES demand functions - dynamic versions of demand - duality and indirect utility functions - Bandwagon, Snob and Veblen effects
Module 2. Theory of Costs and Production
- Traditional and modern theories of costs - production function - Cobb-Douglas, CES, VES and translog production functions
- Producer’s equilibrium using Isoquants - Isocost analysis - technical progress - Harrod and Hicks versions

Module 3. Market Structure and Equilibrium Price and Output Determination
- Classification of markets - short- run and long-run equilibrium under perfect competition, monopoly and monopolistic competition - shut down and break-even analysis - monopoly power - different oligopoly markets - Cournot, Bertrand, Stackelberg, Chamberlin, Kinked demand curve - Cartels - price leadership - price discrimination - game theory and it’s applications - prisoner’s dilemma

- Micro and macro theories of distribution - marginal productivity - Euler’s theorem and adding up problem - contributions of Ricardo, Marx, Kalecky - partial and general equilibrium - contributions of Walras, Hicks - Kaldor - theory of Second-Best - Arrow’s Impossibility theorem - theory of risk and uncertainty - moral hazard, adverse selection and externalities

Unit II
Macroeconomic Theory and Applications

Module 1. Macroeconomic Framework

Module 2. Behavioural Foundations of Macroeconomics
- Consumption functions and puzzle - absolute, relative, permanent and life cycle hypotheses of consumption
- Investment functions - role of interest rate and expectations - neo-classical, Keynesian and accelerator theories of investment - user cost of capital - Tobin’s ‘q’ ratio

Module 3. Theory of Business Cycle, Inflation and Unemployment
- Business cycle facts - direction and timing of variables - aggregate demand and supply analysis of business cycles - theoretical contributions of Samuelson, Hicks and Kaldor - multiplier and accelerator - great depression and financial crisis - alternative views
- Classical, Keynesian and monetarist approaches to inflation and unemployment - Philip’s curve - sacrifice ratio and Okun’s law

Module 4. Macroeconomic Schools and Policies
- Schools in macroeconomics - classical, Keynesian, Monetarists, new classics, supply side - rational expectations - new Keynesian and new political macro economics
- Objectives of macroeconomic policy - monetary policy - instruments- rules vs discretion - Taylor’s rule - dynamic time inconsistency models - fiscal policy - instruments- Barro Ricardo equivalence theorem - income policy
distribution – binomial, poisson, and normal distributions and their properties

Module 2. Mathematical Methods
- Matrix operation – determinants – Crammer’s rule – static and dynamic input-output models – linear programming – graphical and simplex methods – duality and shadow prices
- Functions – rules of differentiation and integration – uses in economics – interpretation of revenue, cost, demand, supply functions, elasticities – market equilibrium – consumer’s and producer’s surplus

Module 3. Econometric Methods
- Methodology of econometric research – simple and general linear econometric models – assumptions – estimation of parameters – co-efficient of determination (R^2) – Gauss Markov theorem – concepts of autocorrelation, multicollinearity and heteroscedasticity and their tests

Module 4. Research Methodology
- Sampling - types and techniques – hypothesis testing – null and alternative hypotheses – type I and type II error – theories of estimation – point and interval estimation – t, F, and chi-square tests
- Research design – collection, organization and analysis of data – presentation of research report

Unit IV
Development Experiences of India and Kerala

Module 1. Growth and structural changes of Indian Economy
- Growth and sector-wise contribution to GDP and employment – demographic features – Distribution of National Income among four factors of production – Regional disparity in growth and development - HDI related indicators in India - poverty and unemployment in India

Module 2. Development Strategies in India

Module 3. Economic Policy and Development in India
- Issues and policies in Agriculture, Industry, Trade, Infrastructure - price movements and India’s monetary, fiscal and financial sector policies and reforms - recent developments

Module 4. Kerala’s Economic Development
- Kerala model of development - Sustainability issues- Poverty and Unemployment in Kerala - Structural changes in Kerala’s economy- performance of agriculture, industry, infrastructure and services – Issues of Migration, Urbanisation and Demographic features - Fiscal scenario in Kerala - Decentralisation and achievements – recent developments

Unit V
Economic Development and Environmental Economics

Module 1. Concept and Measurement of Economic Development

Module 2. Theories of Economic Growth
Module 3. Partial Theories of Growth

Module 4. Measurement of Environmental Values
- Use values; Option values and non-use values; Valuation methods – Methods based on observed market behavior - Hedonic property values and household production models (travel cost method and household health production function) - Methods based on response to hypothetical markets - contingent valuation and contingent ranking methods.

Module 5. Environmental and Natural Resource Problems in India
- Mechanism for environment regulation in India - Environmental laws and their implementation - Policy instruments for controlling water and air pollution and forestry policy - People’s participation in the management of common and forest lands - The institutions of joint forest management and the joint protected area management - Social forestry — rationale and benefits - Solid waste management - causes, effects and control measures (E-waste, Plastic waste, Industrial waste) - Pollution analysis and policy - causes, effects and control measures of pollution (air, water, noise and soil).

Unit VI
Money, Banking, Public Finance and International Trade
Module 1. Money and Banking

Module 2. Public Finance

Module 3. Theories of International Trade
- Theories of international trade - Smith, Ricardo, Heckscher-Ohlin – Leontief paradox – factor price equalization theorem – models based on imperfect competitions – free trade and protection – types and effects of tariffs and quotas – Stopler - Samuelson theorem – Metzler paradox

Module 4. Balance of Payments / Economic Integration

07. English

Unit I
Module 1. Chaucer’s Age
- Socio-political background – Chaucer and his contemporaries Langland, Gower – General Prologue to the Canterbury Tales
Module 2. Early Renaissance in England
- Caxton – Malory – Songs and Ballads – Thomas More’s *Utopia*

Module 3. Late Renaissance England
- Wyatt and Surrey – Beginning of English Sonnet – Spenser “Prothalamion” – Spenserian Sonnet

Module 4. Beginning of English Prose
- Sidney – “Apology for Poetry” – Bacon – Hobbes – Thomas Browne – University Wits

Module 5. Rise of English drama
- Mystery and Miracle plays, morality plays and Interludes – *Gorboduc* – *Ralph Roister Doister*

Module 6. Revenge Tragedy
- Thomas Kyd – Marlowe – *Dr. Faustus* – Blank Verse – Webster – Ben Jonson – Comedy of Humours

Module 7. Elizabethan Theatre
- Stage – Audience – Patronage – Theatres in London – Stage Conventions – soliloquy – Aside – Masque

Module 8. Shakespeare
- Comedies – Tragedies – Histories – Problem Plays – Sources

Module 9.
- Language – Folio – Quarto – Shakespearean Sonnets

Module 10

Module 11
- Puritan England – Reformation – Oliver Cromwell – Commonwealth – John Bunyan – *Pilgrim’s Progress*

Module 12. Milton
- “Paradise Lost Book 1 – “Lycidas” – Sonnets – Prose – Pamphlets

Module 13. The Restoration
- Drama – Comedy of Manners – Congreve – Wycherley

Module 14. Neoclassical age
- Socio-political background

Module 15. Heroic Drama
- Anti-Sentimental Comedy – Sheridan – Goldsmith

Module 16. Popular Prose Writing

Module 17. Dryden and Pope
- Mock heroic and Mock epic – MacFlecknoe

Module 18. Dr. Johnson
- Swift – Burke – John Locke

Module 19. Rise of the novel

Module 20. Transition Poetry
- Gray – “An Elegy Written in a country Churchyard” – Collins – Cowper – Burns – Blake

Unit II

Module 1. Beginning of Romanticism

Module 2. Preface to the Lyrical Ballads

Module 3. Early Romantics
- Wordsworth and Coleridge – Lyric – Ode

Module 4. Later Romantics
- Byron – Shelley – Keats

Module 5. Gothic Novel
- Mary Shelley – Horace Walpole

Module 6. Historical Novel
- Walter Scott – Domestic Novel – Jane Austen

Module 7. Prose
- Lamb – Hazlitt – Leigh Hunt – Dequincy –

Module 8. Early Feminist Writing
Module 9. Beginnings of the Victorian Age
• Sociopolitical background – Victorian compromise

Module 10. Victorian Poetry
• Tennyson, Dramatic Monologue – Browning, Arnold

Module 11. Pre-Raphaelites
• D.G. Rossetti – A.C. Swinburne – William Morris

Module 12. Aestheticism
• Walter Pater – Art for Arts Sake

Module 13. Victorian Prose
• Carlyle – Arnold – Cardinal Newman – Religious Prose

Module 14. Victorian Biography
• Autobiography – Ruskin – Lytton Strachey – Leslie Stephen

Module 15. Victorian Novel
• Victorian Reform Acts – Industrialization – the novels of Charles Dickens

Module 16. Hardy
• Wessex Novels

Module 17. Victorian Women Novelists

Module 18. Victorian Drama
• Comedy of Manners – Oscar Wilde – Discussion Plays – Shaw

Module 19. Transition
• Hopkins – inscape – instress – Sprung Rhythm – “Windhover”

Module 20. Victorian Age and the Colonial Enterprise
• Macaulay’s Minute – Arnold – “Culture and Anarchy” – Rudyard Kipling

Unit III
20th Century and Contemporary British Literature

Module 1. Edwardian period
• World War I - socio-political background

Module 2. War Poets
• Rupert Brooke, Wilfred Owen, Siegfried Sassoon

Module 3. Pink Poets
• W.H Auden
• Cecil Day Lewis, Stephen Spender, Louis MacNeice

Module 4. Avant
• garde writing - Symbolist movement - W.B Yeats – Surrealism – Dylan Thomas

Module 5. Modernist Poetry
• High Modernists – Ezra Pound – T.S. Eliot

Module 6. Verse drama
• Christopher Fry – T.S. Eliot

Module 7. World War II and its aftermath
• Movement poetry- Philip Larkin – Thom Gunn

Module 8. Ted Hughes
• Seamus Heaney – Andrew Motion

Module 9. Prose- G.K. Chesterton
• Max Beerbohm – Bertrand Russell

Module 10. 20th Century Novel
• Virginia Woolf – “Modern Fiction” – Joseph Conrad

Module 11. Early modernism
• D.H Lawrence- psychological novel

Module 12. Stream of consciousness
• James Joyce – Virginia Woolf

Module 13. Dystopian literature
• Aldous Huxley – George Orwell

Module 14. Post war fiction
• William Golding – Kingsley Amis – John Wain – Allan Sillitoe,

Module 15. Drama
• the new drama – Ibsen and his influence- Bernard Shaw

Module 16. Irish dramatic movement
• Abbey Theatre- Celtic revival -Yeats, Synge, O’Casey

Module 17. Post-war drama
• kitchen sink drama- Arnold Wesker - Angry Young Men movement- John Osborne
Module 18. Theatre of the Absurd
- Samuel Beckett – Harold Pinter – Tom Stoppard – Epic Theatre – Edward Bond

Module 19. Recent trends in British Writing
- Doris Lessing – Iris Murdoch – Jeanette Winterson

Module 20. Immigrant Writing
- Kazuo Ishiguro – Hanif Kureishi

Unit IV - American, Indian and New Literatures in English

Module 1. Pilgrim Fathers
- Puritanism in America – Romanticism in America – Emerson – Thoreau – Hawthorne

Module 2. 19th and 20th century American Poetry
- Whitman, Dickinson – Emily Dickinson – Edgar Allan Poe

Module 3. Robert Frost

Module 4. 19th century American Novel

Module 5. 20th century American Novel
- Hemingway – Steinbeck – Saul Bellow – Leslie Mormon Silko

Module 6. Harlem Renaissance

Module 7. The beginnings of Indian Poetry in English
- Western influence – Madhusudan Dutt – Sri Aurobindo – Tagore – Toru Dutt – Sarojini Naidu

Module 8. Indian English Poetry today

Module 9. Indian English Novel Early Phase

Module 10. Indian English Novel Today

Module 11. Indian English Drama

Module 12. African Literature and Colonialism
- Leopold Senghor – Christopher Okigbo – Chinua Achebe – Wole Soyinka

Module 13. African Literature and Post Colonialism
- Ngugi Wo Thiongo – John Pepper Clark – Ben Okri – Athol Fugard

Module 14. Caribbean Intellectual Tradition
- Aime Cesaire – Frantz Fanon – C.L.R. James

Module 15. Caribbean Literary Tradition
- V.S. Naipaul – George Lamming – Derek Walcott – Edward Brathwaite

Module 16. Canadian literature

Module 17. Canadian Literature

Module 18. Australian literary history

Module 19. Patrick White
- Sally Morgan – David Malouf – David Williamson

Module 20. South Asian Literature
Unit V
History and Structure of English and English Language Teaching

Module 1. The Sound system of English
- Vowels and consonants

Module 2. English phonology
- Syllable structure - stress - words in connected speech - intonation - phonological rules - assimilation, elision, weak forms

Module 3. English morphology
- Morphemes - processes of world building - affixation

Module 4. Semantics
- Types of meaning - semantic change

Module 5. The Indo-European family of languages
- The descent of English - Germanic family - Grimm’s Law - Verner’s Law

Module 6. Old English
- Old English dialects - Old English Grammar - Old English Pronunciation - Old English vocabulary - Old English Literature - Scandinavian influence on Old English

Module 7. Middle English
- The influence of Norman French - Middle English grammar - Middle English Pronunciation - Middle English vocabulary - Middle English Literature - Translations of the Bible

Module 8. English at the Renaissance
- Influence of Latin and Greek - Colonialism and English - Contribution of Shakespeare and Milton.

Module 9. English overseas
- American and Indian English - Pidgins and Creoles

Module 10. English in the postcolonial world
- English as the language of knowledge and global communication - many Englishes.

Module 11. Approaches to language learning
- Behaviourism - cognitivism - constructivism - social constructivism - critical pedagogy

Module 12. Theory of language
- Language as knowledge - language as skill - language as a set of structures - language as a set of behavioural patterns

Module 13. History of English Teaching in India
- Macaulay - English as a language of administration - English as a language of culture - English language teaching in Independent India - English as a language of opportunity.

Module 14. English as a Second language (ESL)
- English as a Foreign Language (EFL) - English for Specific Purposes (ESP) - English for communication

Module 15. Methods of language teaching
- Grammar translation method - direct method - audio lingual method - oral-situational method - the silent way - community language learning

Module 16. Learner factors
- Attitude - aptitude - motivation - age - Learning conditions and learning environment

Module 17. Classroom procedures
- Presentation - interaction - feedback - evaluation - lesson plans for teaching prose, poetry, fiction, grammar - for teaching of oral and written communication

Module 18. Teaching materials/aids
- Traditional and new - audio-visual aids - computer aided language learning (CALL)

Module 19. Tests and evaluation
- Internal and external evaluation - formative and summative evaluation - continuous and comprehensive evaluation - assessment of learning and assessment for Learning - types of tests - tools for evaluation - types of questions

Module 20. Keywords
- Bilingualism and multilingualism - learning vs. acquisition - L1 and L2 - code mixing and code switching - first language interference
Unit VI
Literary Theory and Criticism

Module 1. Aristotle
- Poetics - Tragedy - Catharsis - Longinus - Sublime - Apology for Poetry - Johnson - Preface to Shakespeare

Module 2. Romanticism
- Theory and criticism - Poetiv diction and language - fancy and imagination - negative capability

Module 3. Matthew Arnold
- “Function of Criticism” - Eliot - “Tradition and Individual Talent” - Objective Correlative - Leavis - Practical criticism

Module 4. William Empson

Module 5. Liberal Humanism
- Turn to Theory - Text, Identity, Language - Russian Formalism

Module 6. Marxist Criticism
- Capital - Base - Superstructure - Althusser - Gramsci - Neo Marxism

Module 7. Saussure
- Structuralism - Levi Strauss - Semiotics

Module 8. Psychoanalysis
- Freud - Id - Ego - Sexuality - Unconscious

Module 9. Modernism
- Habermas - Modernity - Postmodernism - Fredric Jameson

Module 10. Post structuralism
- Barthes - “The Death of the Author” - Derrida - Deconstruction - Structure - Sign - Play

Module 11. Feminism
- First Wave - Virginia Woolf - Simone de Beauvoir - Second Wave - Betty Friedan - Feminine Mystique - Elaine Showalter

Module 12. Gender and Sexuality
- Sex - Gender - Gender Play - Judith Butler

Module 13. Postcolonialism
- Edward Said - Bill Ashcroft - Empire Writing Back - Subaltern School - Race and Ethnicity - Homi Bhabha - Hybridity - Mimicry

Module 14. Cultural Materialism and New Historicism
- Dollimore - Political Shakespeare - Foucault - Power and Discourse

Module 15. Dalit Aesthetics
- Ambedkar - Namdeo Dhasal - Limbale -

Module 16. Theories of Translation
- Source Text - Target Text - Equivalence - Meaning - Untranslatability - Rewriting - Adaptation

Module 17. Cultural Studies
- Culture - Ideology - Hegemony - Frankfurt School - Birmingham School - ‘Culture is Ordinary’ - Raymond Williams - Representation - Media, Society, Popular Culture

Module 18. Green Studies
- Cheryl Glotfelty - Eric Fromm - Rachel Carson - Vandana Shiva

Module 19. Indian Aesthetics
- Bhava - Vakrokti - Rasa - Dhvani

Module 20. Alamkara
- Anumana - Riti - Sphota - Aucitya

08. French

Unit I
Literature

Module 1. Middle ages to 17th century
- Works of François Villon, Joaquin Du Bellay, Pierre de Ronsard, Montagne, François Rabelais, Chrétien de Troyes, Pascal, Jean Racine, Pierre Corneille, Jean de la Fontaine, Boileau, Molière, La Rocheoucauld and Mme de Sevigne to be studied. Also emphasis to be given on the work ‘Chansons de Geste’, Roman de la Rose and Roman de Renard.
Module 2. 18th and 19th century
- Works of Chateaubriand, Diderot, Voltaire, Rousseau, Montesquieu, Marivaux, Chenier, Beaumarchais, Lamartine, Victor Hugo, Alfred de Vigny, Alfred de Musset, Gustave Flaubert, Charles Baudelaire, Paul Verlaine, Mallarme, Rimbaud, Jules Verne, Guy de Maupassant, Alexandre Dumas, Emile Zola, Stendhal and Marcel Proust to be studied.

Module 3. 20th and 21st century

Module 4. Literary Criticism

Unit II
Culture and Civilisation
Module 1. Geography
Module 2. History
Module 3. Heritage
Module 4. Art and Cuisine

Unit III
Linguistics, Methodology & Fle
Module 1. Translation
- Translation of proverbs, idioms, expressions etc...
Module 2. Different domains of linguistics
- Phonetics & Phonology, Morphosyntax, lexicography, semantics etc...) History of linguistics (Jakobson, Saussure, Chomsky, Skinner etc....
Module 3. Different methods (including Indian)
- Reference tools of FLE (FLE, CECR etc - Full form), critical approach of different methods

Module 4.
- Learning Activities in different methods including use of different documents

Unit IV - Grammar
Module 1. Moods and Tenses
Module 2. Substantives, Pronouns, Complements
Module 3. Articles, Adjectives, Adverbs
Module 4. Language Usage

Unit V - Francophone Literature, Culture and Civilisation
Module 1. Canadian
Module 2. European
Module 3. Asian
Module 4. African

Unit VI - Contemporary France
Module 1. Tourism and Hospitality
Module 2. Society
Module 3. Commerce and Industry
Module 4. Science and Technology

09. Gandhian Studies

Unit I
Making of the Mahatma
Module 1. Early life and education
- Family heritage and influence - Father, Mother and Maid
Module 2. Education in England
- Failed attempts to assimilate Western values. Acquaintance with Indian religions and traditions- association with London Vegetarian Society and conversion to vegetarianism. Influence of life in England-Indian influences on Gandhi’s life and thought- Gita, Raichandbhai, Jainism, Buddhism
Module 3. Gandhi as a lawyer in South Africa
- Experience of racial discrimination-acquaintance with the problems of the Indian community- formation of the Natal Indian Congress- Boer War and Natal Indian Ambulance Corps- Phoenix Settlement-Indian Opinion, Vow of Brahmacharya

Module 4. Western influences
- New Testament, John Ruskin , Leo Tolstoy, Henry David Thoreau, Emerson, Carpenter

Module 5. Advent of Satyagraha in South Africa
- From passive resistance to Satyagraha - Different Satyagraha campaigns in South Africa – Tolstoy Farm - From M K Gandhi to Mahatma

Unit II Fundamentals of Gandhian thought

Module 1. Concept of Human Nature and Perfectibility
- interconnectedness and relational world view

Module 2. Truth
- Relative and absolute truth, God-Truth congruence- Nonviolence- Nonviolence as a creed as opposed to policy

Module 3. Relationship between ends and means
- notion of Dharma in the context of rights and duties & Karma – Nishkama Karma

Module 4. Pursuit of Truth through nonviolent means
- Satyagraha as soul force – Conscience as the final arbiter

Module 5. Cardinal and Ashram Vows
- Satya, Ahimsa, Asteya, Aparigraha, Brahmacharya, swadeshi, fearlessness, bread labour, untouchability, sarva dharma samabhava, control of palate.

Unit III Political and Economic Thought

Module 1.
- Gandhi’s critique of modern civilization and vision of true civilization

Module 2.
- Concept of Swaraj, Power and State-Spiritualisation of politics

Module 3.
- Critique of Parliamentary Democracy – Decentralisation of Power- Panchayati Raj - Concept of Ram Rajya – pluralist nationalism and internationalism

Module 4.
- Sources of Gandhian Economics , Ethics and economics- industrialization and technology, attitude towards machinery, trusteeship, swadeshi and international trade-production by the masses vs mass production - conservation of resources and limitation of wants

Module 5.
- Economy of permanence of J C Kumarappa-Influence of Gandhian ideas on economic policy in India, Contributions of Vinoba Bhave & E F Schumacher - appropriate technology – Importance of Khadi and Village Industries in Gandhian schema-Gandhian approach to development . Gandhian approach to rural development

Unit IV Social and Educational Ideas
- Individual and society removal of untouchability- harijan uplift , communal harmony,
- Varnashrama dharma, prohibition, views on women, seven social sins
- Gandhian approach to health and sanitation- constructive programme:
Unit V
Peace Studies and Conflict Resolution

- Meaning and nature of conflict. Conflict analysis as a key step to conflict resolution. Approaches to conflict resolution - Negotiations, Facilitated Problem Solving, Mediation
- Conflict Transformation - Ideas of Galtung and John Paul Lederach, Culture and Conflict Resolution
- Gandhian approach to peace and conflict transformation, Learning from Gandhi’s Satyagraha Campaigns (Champaran, Salt Satyagraha, Kheda, Ahmedabad), Role of Shanti Sena. Building peace from below - the role of reconciliation and forgiveness in conflict resolution. Examples of Truth and Reconciliation Commissions.

Unit VI - Gandhi and the modern world

- Problems related to human survival - Ecological crisis - Depletion of resources sustainable energy - climate change, reckless urbanization, increase in violence, sanitation, nuclear arms races, piling up of court cases, food security and Gandhian responses to such crises
- Gandhian legacy in India - Vinoba Bhave and Jayaprakash Narain's contributions, Panchayat Raj and the 73rd and 74th amendments, the emergence of voluntarism and cooperatives in India - Chipko & Apiko Movements, Narmada Bachao Antholan, Bhalajpat Movement, Koodankulam movement, Ralegaon Siddhi, Hari Vallabh Parikh, Irom Sharmila, Nilpu Samaram
- Gandhi’s global legacy: Martin Luther King Jr., Petra Kelly, Lanza Del Vasto, Cesar Chavez, Aung San Su Chi, Nelson Mandela
- Nonviolent Action worldwide: Khudai Kidmatgars, Tianmen square, Philippines, Arab Spring
- Organic Farming movement, Gandhian insights on leadership and management, ADR movement

10. Geography

Module 1.
Concepts in Geography

- Geography - meaning, definition, nature and scope - Concepts, theories, Laws and models in Geography - Branches and Approaches

Module 2.
Development of Geographical thought - Classical, medieval and modern periods - Founders of modern geographical thought

Module 3.
- Traditions in Geography - Dualism and Dichotomies - Paradigms - Modern concepts and trends in Geography - Quantitative revolution - Spatial, Location and System Analysis

Module 4.
- Foundation in Human Geography - Principles of Human Geography - Approaches; Determinism, Possibilism, Neo-determinism, man-environment relations;
Forms of human adaptation to the environment.

**Module 5.**
- Cultural regions – Stages of human development, major human races, major languages and religions of the world – cultural regions; Heartland and Rimland theories

**Unit II**

**Physical Geography**

**Module 1.**
- Formation and classification of rocks and soils.

**Module 2.**
- Oceanography: Major Oceans - bottom relief of major oceans, Composition of Sea Water, Salinity, Temperature and density - Movements of ocean Water - Waves, Tides, Currents, Ocean deposits.

**Module 3.**
- Atmospheric moisture, humidity, condensation - clouds - types, fog-types, precipitation - types of precipitation, air masses and fronts - formation and classification.
- Climatic classification - Koppen and Thornthwaite, ozone depletion, Elnino, LaNino, southern oscillations, Climate change and global warming.

**Module 4.**

**Unit III**

**Resource Geography**

**Module 1.**
- Economic Geography – Resources, meaning, classification, Major resources – Natural and human resources.

**Module 2.**

**Module 3.**

**Module 4.**
- World agricultural regions – Agricultural regions of India – Revolutions in agriculture and recent trends – Problems and prospects of Indian agriculture.

**Module 5.**
Module 6.

Unit IV
Urban and Regional Planning

Module 1.
- Regional Planning – concepts, types, regions and approaches.

Module 2.
- Growth Pole – polarisation and spread effect, growth foci concept in regional planning, levels and regional planning – district, block, panchayath, watershed planning and people’s participation in planning.

Module 3.
- Regional Growth – economic base concept, inter intra regional planning, regional imbalance and levels of development. five year plans and urban development programmes.

Module 4.
- Definitions of Urban centers, process and factors of urbanization Classification of urban centers based on size and function.

Module 5.
- Urban morphology, Urban land use models - CBD – Christaller’s central place theory and Losch theory. Urban housing, slums & fringe development

Unit V
Geography of India

Module 1.
- Location, Unity in Diversity, Physiography, Climate, Drainage, Soil and Natural Vegetation

Module 2.

Module 3.
- Fisheries, Mineral and Power Resources; Industries-Iron and Steel, Textiles, Sugar, Cement, Paper, Chemicals an Fertilizers, Industrial regions.

Module 4.
- Trade, Transportation and Demographic Characteristics.

Module 5

Unit VI
Geoinformatics

Module 1.

Module 2.
- Phases of cartographic processes – Map compilation – Generalization – symbolization, map design and layout – Map reductions and enlargements.

Module 3.

Module 4.

Module 5.
- Satellite Remote Sensing -Satellites and their characteristics- Orbits, Swath, Nadir – Sensors and types, Sensor Resolutions- Scanning - Satellite programmes of USA, Russia, France and India.
Module 6.
- Elements of Image Interpretation, Digital Image Processing: Rectification, Geometric correction, Radiometric correction, Noise removal, Image enhancement and classification – Application – GPS.

Module 7.
- GIS; - Concepts and components of GIS, Analog and digital map, Sources of spatial data, Functions of GIS. Data model - Raster and vector - Spatial data structure - Database, DBMS and functions - Relational data base models - Concept of SQL and metadata - Linking of spatial and attribute data.

Module 8.

11. Geology

Unit I

Module 1. Physical Geology
- Internal structure of the earth - Basic concepts of seismology - heterogeneity of the earth’s crust - physico-chemical and seismic properties of the earth’s interior - Density distribution within earth.
- Earth’s magnetic field - changes in magnetic field - origin of geomagnetic field - Geomagnetism - Palaeomagnetism- Magnetic anomalies - Magnetic reversals.
- Thermal history of the earth-Heat within the earth - Geothermal gradient and heat flow.
- Earthquakes - types, causes and effects. Prediction of earthquakes.

Module 2. Geomorphology
- Landforms - relation of igneous activity, structure and lithology to landforms.
- Hill slopes - processes and evolution.
- Fluvial geomorphology: drainage basin - morphometric analysis of drainage basins - fluvial processes and landforms.
- Concept of rejuvenation and interruption in the evolution of landforms.
- Coastal geomorphology: Coastal processes and associated landforms.
- Desert geomorphology: Aeolian process and associated landforms.
- Glaciers and glacial processes - glacial landforms; Glaciation.
- Concepts of Monocyclic, Polycyclic and Polygenetic landforms.
- Coral reefs: types and significance.
- Brief idea of the geomorphic features of the Indian sub-continent and Kerala.

Module 3. Planetary Geoscience
- Milky Way and the solar system. Big bang theory and formation of the planetary systems. Members of the solar system. Orbital characteristics of planets. General
characteristics of the terrestrial planets - crust, surface features, volcanism.
- Meteorites: Chondrites, SNC meteorites, Refractory inclusions, Iron meteorites.
- Asteroids: Classification and composition, Surface features, Asteroid sources, Asteroid impacts on the earth.

Module 4. Marine Geology
- The ocean floor, general topography - Turbidity currents, Eustatic movements.
- Coastal processes: waves, currents and tides. Classification of Sea coasts and shorelines; Classification of shorelines and coasts, beach classification.
- Marine Sediments, their sources and transportation. Classification of marine sediments.
- Methods of exploring the ocean floor.

Unit II
Module 1. Crystallography and Mineralogy
- Crystalline state - Lattices- Point, Line, Space; Repetition theory, Translational Periodicity and Rotational Symmetries.
- Symmetry elements and Crystal Systems; study of normal classes.
- Crystal projection - Stereographic and spherical projections.
- Descriptive Mineralogy: Classification and structure of silicates.
- Distinctive physical and optical characters and chemical composition of the following groups: Olivine, epidote, garnet, aluminosilicates, pyroxene, amphibole, mica, feldspar and feldspathoid.
- Distinctive physical properties, chemical composition and mode of occurrence of the following groups of minerals: oxides, sulphides, carbonates, halides, phosphates, sulphates.
- Application of modern techniques in mineral studies - XRD, XRF, ICP, EPMA.

Module 2. Igneous Petrology
- Igneous process - Phase rule and its application in the study of silicate systems - phase diagrams, Eutectic crystallization - Solid solution series - Incongruent melting.
- Course of crystallization in typical binary systems. Reaction principle and reaction series. Mode and Norm. CIPW Norm. Textures and their genetic significance.
- Equilibrium crystallization and melting paths in ternary systems.
- Anorthite - Wollastonite - Silica
- Diopside - Anorthite - Albite
- Albite-Anorthite - Orthoclase
- MgO - Al₂O₃ - SiO₂.
- Basalt system - classification of basalts.
- Igneous process and diversity in igneous rocks. Compositional variation in magmas. Variation diagrams. Trace elements in igneous processes; application of trace elements to petrogenesis. Radiogenic tracers.

Module 3. Metamorphic Petrology
- Concepts of metamorphism: Limits, Types and Factors of metamorphism.
- Application of phase rule in metamorphic mineral paragenesis.
- Metamorphic structures and textures - their significance.
- Classification of metamorphic rocks: after Eskola, Barrow and Winkler.
- Graphical representation of metamorphic mineral assemblages - ACF, A’KF and AFM diagrams.
- Metamorphic differentiation; Metamorphism and plate tectonics; Ultra High Temperature (UHT) and Ultra High Pressure (UHP) metamorphism, Anatexis.
- Geothermobarometry.
- General characteristics of metamorphic domains - Contact metamorphism, Regional metamorphism, Paired metamorphic belts, Orogeny and Metamorphism, Retrograde and Prograde metamorphism.
- Metamorphism of carbonate rocks, pelites, mafic and ultramafic rocks.

Module 4. Sedimentary Petrology
- The Sedimentary Cycle, Grain shape, Sphericity, Roundness and surface textures.
- Sedimentary Structures: Physical, chemical, biogenic and deformation structures.
- Mineral Composition, texture and classification of sandstone, limestone, shale and argillite. The concept of Average shale.

Unit III

Module 1. Stratigraphy
- Contributions of the pioneers of Stratigraphy, Geologic Time Scale.
- Correlation in Stratigraphy: Types and methods. Basic stratigraphic principles.
- Lithostratigraphic, Chronostratigraphic and Biostratigraphic classifications and units; Hierarchy.
- Basics of Magnetostratigraphy, cyclostratigraphy, pedostratigraphy, chronostratigraphy and sequence stratigraphy.

Module 2. Quaternary Geology
- Quaternary Glaciations: Cryosphere and the Pleistocene glaciation. Ice core records, Holocene glacier records, Causes of ice-sheet growth and decay, Patterns of glacial-interglacial cycles.
- Quaternary sea level changes: Evidences and causes of sea level changes. Recent and historic sea level fluctuations, Holocene transgression, Land bridges.

Module 3. Palaeontology
- The origin of life: Scientific models, the biochemical model, evidences for the origin of life, the great oxygen event, life during Precambrian, diversification of life. Evolution of life in the Palaeozoic, Mesozoic and Cenozoic eras.
- Mass extinctions and biodiversity loss: Pattern and timing of extinctions, selectivity,
Periodicity of mass extinctions, the big five mass extinction events.

- General classification of microfossils.
- Classification, general morphology, ecology, evolution and geological history of Foraminifera, Ostracodes, Radiolaria and Diatoms.
- Evolutionary trends, Stratigraphic importance and Classification of the following invertebrates: Brachiopoda, Arthropoda and Mollusca.
- General characteristics, classification and evolution of Pisces, Amphibians, Reptiles, Birds and Mammals (Horse and Man).
- Plant fossils of Gondwana Age.

Module 4. Indian Geology

- Brief study of the physiographic divisions of India. Major geological divisions of India.
- Pre-Cambrian stratigraphy: Classification of Indian Pre-Cambrian with particular reference to Karnataka and Kerala. Greenstone belts and granulites of South India. Classification, lithology and ages of Sargur Group, Aravalli and Delhi Super Groups. Dharwar Supergroup, Cuddapah Supergroup and Vindhyan Supergroup. Intrusive rocks in Kerala.
- Major Phanerozoic Basins in India: General description, age, development, evolution, stratigraphy and classification of the following basins in India - Gondwana Basin, Kaveri Basin, Kerala Basin, Cambay Basin.
- Mesozoic Stratigraphy: Major Triassic, Jurassic and Cretaceous stratigraphic units in India.
- Cenozoic successions in India: Cenozoic succession of Assam, Siwalik Supergroup, Cuddalore, Quilon and Warkalli Formations, Karewa Group, Indo-Gangetic Alluvium.

Unit IV

Module 1. Structural Geology

- Lineation: types, classification and origin. Lineaments.
- Geologic bodies and scale, structural co-ordinates. Fundamentals of geometric analysis. Stereographic projections in Structural Geology.

Module 2. Geotectonics

- Continental drift: geological and geophysical evidences, mechanism, objections, present status.
- Major tectonic features of the continental and oceanic crust - Shield, cratons, etc.; Concept of Rheology.
- Plate tectonics: types of plate margins; Island arcs, oceanic islands and volcanic arcs; Subduction zones and Deep sea trenches; Sea floor spreading - Mid-oceanic ridges; Polar wandering and polar reversals.
- Orogeny and Epeirogeny;
- Mountains - classification.
- Global seismic belts.
- Geodynamics of the Indian plate.
Module 3. Engineering Geology
- Role of Geology in Civil Engineering.
- Engineering properties of rocks and soils.
- Rock as a building material - dimension and decorative stones - aggregates.
- Geologic criteria for selection and investigation of sites for dams, reservoirs and tunnels.
- Landslides: types, causes and mitigation.
- Influence of geological conditions on building foundations and design.

Module 4. Hydrogeology
- Groundwater Management: Dynamic and Static resources, Concept of Rainwater Harvesting, Artificial recharge and recovery techniques. Use of isotopes in hydrological studies.
- National Groundwater Status: Groundwater provinces of India, Hydrogeochemical provinces of India, Groundwater conditions and quality problems in Kerala.

Module 1. Geochemistry
- Goldschmidt’s geochemical classification of elements. Crustal abundance and concept of major, minor and trace elements.
- Geochemistry of important elements: Alkalis, alkaline earths, hydrogen, aluminium, carbon, silicon, nitrogen, oxygen and sulphur.
- Basic principles in geochemistry: Geochanical environment, surficial and deep seated environment, geochemical cycle, geochemical dispersion - primary and secondary dispersion, dispersion halos, geochemical mobility.
- Isomorphism, Polymorphism, Solid solution, Exsolution.

Module 2. Economic Geology
- Ore mineral - definition; tenor, grade and specifications.
- Theories of ore genesis. Ore forming solutions and their migration. Wall-rock alteration -Controls of ore localization - Paragenetic sequence and zoning - Metallogenic epochs and provinces.
- Classification of ore deposits: Lindgren and Bateman. Processes of formation and characteristic features of various types of mineral deposits. Greisen deposits, skarn
deposits, disseminated sulphide, oxide and sulphate deposits of sedimentary and volcanic environments.

- Salient features of hydrothermal, sedimentary, residual and supergene sulphide ore deposits with examples. Stratabound and stratiform ore deposits.
- Ore deposits related to plate boundaries; ore deposits of metamorphic affiliations.
- Genesis, geological settings, mode of occurrence and distribution of deposits of iron, copper, lead, zinc, aluminium, magnesium, manganese, chromium and titanium in India. Major Indian occurrences of mica, asbestos, barite, graphite, gypsum, precious and semi-precious minerals. Indian occurrence of refractory minerals, abrasive minerals and minerals used in ceramic, glass, fertilizer, cement, paint and pigment industries.
- Petroleum Geology: Physical properties and chemical composition of petroleum; Occurrence and origin of petroleum -Source rocks -process of transformation of organic matter to petroleum; Migration and accumulation of petroleum - Reservoir rocks: types -general, structural, stratigraphic, salt domes. Important petroliferous basins of India: Distribution of oil fields in India - Assam shelf basin, Bombay offshore basin, Cambay basin, Krishna-Godavari basin.
- Brief idea of gas hydrates; Coal bed methane; Natural gas - distribution and nature of occurrence in India.
- Atomic minerals: distribution and mode of occurrence in India.
- Mineral resources of the sea: sources of sea minerals, sea water, extraction of elements, continental shelves, Deposits under the surficial sediments of the continental shelves, deposits in the deep sea floor. Law of the sea - UNCLOS - Exclusive Economic Zone, International sea bed area and authority - Indian strategy for future exploitation of seabed deposits.
- National Mineral Policy - MM (R&D) act - Procedures for Grant of Mineral Concessions in India - UNFC classification - Global mineral reserves and resources - Minerals and sustainable development.
- Strategic, Critical and Essential minerals: definition; distribution in India.
- State-wise share of mineral production in India.

Module 3. Exploration Geology

- Methods of surface and subsurface exploration. Principles and methods of sampling and assaying.
- Methods of estimation of ore reserves. Field equipments and field tests used in exploration.
- Phases of geological exploration. Drilling: Methods and types of drilling. Logging of bore holes; preparation of sections and level plans, fence diagrams. Subsurface mapping.
- Sampling: sampling pattern of surface exposures, mine workings, trenches, pits, drill holes, channels, placers; Bulk sampling.
- Geobotanical exploration: Biogeochemical exploration; methods of biogeochemical prospecting of ore deposits; Biogeochemical anomalies; Geobotanical indicators.
- Geophysical exploration: Principles, scope, chief methods and their applications. Electrical methods: principles and instruments; Self potential method. Gravity methods: Principles and applications; gravity anomalies - regional and local; Bouguer anomaly and corrections. Instrument used -

- Geophysical well logging: electrical, radiometric, sonic and thermal logging.

Module 4. Mining Geology

- Basic mining terminology - classification of mining methods: alluvial mining, open cast mining and underground mining.
- Coal mining - deep sea bed mining - petroleum mining.
- Methods of stoping - shaft sinking - mine supports - mine ventilation - mine hazards - principles of mine evaluation - role of geologists in operative mining.
- Mineral and ore beneficiation: Principles of ore dressing: crushing and grinding - comminution units - comminution practices - sizing - screening units.
- Classifying techniques - filtering and drying. Hydroclones: classifiers and gravity concentration units; Ore concentration methods: Froth floatation reagents and practices, magnetic and electrostatic separation methods.

Unit VI

Module 1. Remote Sensing

- History and the developments of Aerial photography - Geometry and type of aerial photographs - Scale of photographs - Type of aerial cameras, films and filters - Multiband photography - Tilt and height displacement - Vertical exaggeration - Stereoscopy - Mosaics - Elements of photo interpretation, Use of Aerial photographs in photogrammetry, geology, geomorphology, mineral and groundwater exploration, land use, forestry, agriculture, environmental studies.
- Basic principles of Satellite Remote Sensing: definition and components - Electromagnetic spectrum - Black body radiations - spectral reflectance of land covers - Atmospheric window - Platforms and sensors - Active and passive sensors - Sun synchronous and geosynchronous satellites - Payloads - Land coverage capability. Resolution concepts; Multi Spectral Scanners (MSS); Spectral signatures - data acquisition and format.
- Interpretation and Geological application of satellite remote sensing data - visual and digital - Basic concepts of digital image processing - use of satellite data in geological studies.

Module 2. Geoinformatics

- Spatial data models - spatial data structures, modeling surfaces and networks - modeling the third and fourth dimensions.
- Global Navigation Satellite System (GNSS) - GPS: Satellite constellation - signals and data...
Module 3. Environmental Geology

- Scope of environmental geosciences: Natural resources - Renewable resources, non-renewable resources - Sustainable management of resources - Alternative energy sources. Land, its uses and management - Resources of the ocean floor - Mineral Resources: Conservation, management and concept of sustainable development.
- Pollution: Air, water and soil pollution, causes, effects and managements. Greenhouse Effect and Ozone Layer Depletion. Global warming and climate change.
- EIA: Introduction, Definition, aim, principles and concept.

Module 4. Field Geology

- Scope and importance of Field Geology - geologic map and mapping - types of mapping - map symbols - reconnaissance - preparation. Basic equipments necessary for geological mapping and their uses.
- Basic procedure in the field: Taking compass bearing - taping and pacing - locating the position in the map - use of GPS. Observation in the field, interpretation of the outcrop - filed notes - drawing and photographing the outcrops - measuring the attitudes of planar and linear features - collecting fossils, rock samples - their identification and naming.
- Geological mapping of sedimentary, igneous and metamorphic terrains and structures.
- Preparation of final geological map and reports: Field study to report writing, major illustrations, photographs, drawings, diagrams, designing the report, format and specific parts of the report.
neudeutsche Sprachperiode - Das Frühmittelalterliche Deutsch - Höfische Dichtersprache - Barocksprache

- Text Book: A. Hugo Moser Deutsche Sprachgeschichte

**Unit II**

**Deutsche Literaturgeschichte**

**Module 1. (c.500-c.1500)**
- Frühmittelalter - Hochmittelalter - Spätmittelalter

**Module 2. (c.1500-c.1835)**
- Humanismus - Renaissance und Reformation - Barock - Aufklärung - Empfindsamkeit/ Sturm und Drang - Klassik - Romantik

**Module 3. (c.1815-c.1932)**
- Biedermeier - Junges Deutschland und Vormärz - Realismus - Naturalismus - Expressionismus - Avantgarde/ Dadaismus - Literatur der Weimarer Republik - Neue Sachlichkeit

**Module 4. (c.1933– )
- Exilliteratur - Nachkriegsliteratur/ Trümmerliteratur
- Literatur der DDR/ Literatur der BRD - Literatur Österreichs und der Schweiz
- Grabert und Mulot : Geschichte der deutschen Literatur

**Unit III**

**Deutsche Literatur/ Literaturwissenschaft**

The following primary works:

**Module 1. Das Nibelungenlied**
- Hartmann von Aue: Der Arme Heinrich
- Christian Reuter: Schelmuffsky

**Module 2.**
- Joseph von Eichendorf: Aus dem Leben eines Taugenichts
- Georg Büchner: Woyzeck
- Conrad Ferdinand Meyer: Das Amulett
- Rainer Maria Rilke: Herbsttag

**Module 3.**
- Bertolt Brecht: Der Kaukasische Kreidekreis
- Wolfgang Borchert: Nachts schlafen die Ratten doch
- Heinrich Böll: Wanderer, kommst du nach Spa...
- Heinrich Böll: Was ist Trümerliteratur
- Luise Rinser: Die rote Katze
- Friedrich Dürrenmatt: Der Besuch der alten Dame

**Module 4. Günter Grass: Katz und Maus**
- Günter Grass: Kopfgeburten Oder die Deutschen Sterben aus
- Anna Seghers: Kleiner Bericht aus meiner Werkstatt
- Eva Strittmatter: Mein Land

**Module 5. Reiner Kunze: Die Mauer –**
- Heinz Kahlau: Tag der Einheit –
- Erika Runge: Bottroper Protokolle : Erna E Hausfrau
- Angela Stachowa: Ich bin ein Kumpel
- Christoph Hein: Kein Seeweg nach Indien
- Text Books: Juergen W Goette – Methoden der Literaturanalyse
- Philip Rice/Patriciai Waugh - Double Reading; Postmodernism

**Module 6.**
- Positivist Method of Literary Analysis - Work centred method - Psychological Method - Racist Method - Sociological Method - Aesthetics of Reception
Unit IV
History of Western Philosophy and German Culture

Module 1. Western Philosophy
- Text Book: Fueller Mc Murrin – A History of Philosophy
- Text Book: Klaus Schulz – Deutsche Geschichte und Kultur

Module 2. German Culture

Unit V
Politische Geschichte / Landeskunde

Module 1.
- Von den Römern zu den Stauferkaisern 110 V.Chr – 1150 N.Chr
- Deutschland im Mittelalter 1150 – 1480

Module 2.
- Das Zeitalter der Reformation und Gegenreformation 1450 – 1648
- Das Zeitalter des Absolutismus – vom Barock zur Aufklarung 1550 – 1770
- Das Zeitalter der Revolutionen / Frage nach der Deutschen Nation 1780 - 1850
- Der Weg Deutschlands zur Nationalstaat 1850 – 1914

Module 3. Die Weltkriege 1914 – 1945
- Deutschland nach dem II. Weltkrieg

Module 4. Entstehung und Wirtschaft der BRD
- Politische Parteien und Politische Kultur der BRD
- Regierung und Verwaltung
- Das Berlin-Problem
- Wiedervereinigung
- Die Entstehung der DDR
- Die Entnazifizierung
- Text Book: Klaus Schulz – Deutsche Geschichte und Kultur
- Kurt Sonntheimer – Grundzuge des politischen Systems

Module 5. Bundesrepublik Deutschland – Staat und Gesellschaft
- Österreich - Staat und Gesellschaft

Unit VI
Methods of Teaching German as a Foreign Language

Module 1. Language and Linguistik
- Direct Method of Teaching
- Grammar-Translation Method
- Language and Culture
- Modern Theory of Language Learning

Module 2. Principles of Language Teaching
- Intonation and Rhythm
- Pattern Practice
- Cultural Content and Literature

Module 3. Language Testing
- Language Laboratory
- Visual Aids/Types
- Teaching Machines
- Programmed Learning
- MLA Qualifications

Module 4. Live Words and their Meaning
- Bilingualism
- Lexicography
- Linguistic Ontogeny
- False Cliches
- Text Books: Robert Lado – Language Teaching

13. Hindi

Unit I
Hindi Sahitya Ka Itihas-Aadikal Se Poorv Bharatendu Yug Tak

Module 1.

Module 2.
- Reetikaleen Paristitiyan-Reetikaleen Bhasha-Reetikal ka Soudary sastra-reetikal
Unit II
Hindi sahity ka itihas-bharatendu yug se unnees sou chalees tak

Module 1.

Module 2.
- Chayavad-Darshanik Prishtabhoomi-Paschaty Prabhat-Pramukh Kavi evam Kavy-Chayavadi Sameeksha-Brajbhasha Kavy-Rashtriya Sanskritik Kavydhara evum Pramukh Kavy-Halavad

Module 3.

Unit III
Aadhunik Kal- 1940 Se 2015 Tak

Module 1.

Module 2.

Unit IV
History of Hindi Language & Structural Grammer

Module 1.
- Hindi ki Aithikasik Prushtabhumi-Bhashik Swaroop-Hindi ka Vyavaharik Kshet-Lipi ka Udbhav aur Vikas-Devnagar Lipi Ka Vikas

Module 2.

Unit V
Western and Eastern Literary Thoughts, Prosody & Poetics

Module 1.
State Eligibility Test - Syllabus 2016 .................................................................
Module 2.
- Trends during the Medieval Period: Arab and Turko-Persian traditions – Regional historical writings – Mughal historiography

Module 3.
- Colonial construction of India – Ethnography – Census - Administrative History – Manuels – Surveys and Gazatteers

Module 4.
- Nationalist approaches – Neo Colonial writings (Elitist approach, Cambridge school) – Indian Marxist Historiography – Subaltern historiography

Module 5.
- Greco – Roman historiography – Medieval historiography – Developments during the Enlightenment

Module 6.

Module 7.

Unit III
Kerala History

Module 1.
- Geography of early Kerala – Patterns of Habitat and settlements – The Stone Ages, Megaliths, different phases – Iron Age.

Module 2.
- Society as represented in early Tamil writings – cattle raids and wars – chieftaincies – Ecozones (Tinai) – Nature of exchange – Foreign Trade

Module 3.
- Dissolution of early social systems – Expansion of organized agriculture, 32 Brahman settlements – Political consolidation under the Perumals - Autocracy or oligarchy? – Nature of land ownership (Dewaswam, Brahmswam) – Karanmai systems – Adimalai form of labour – Trade relations – guilds and emporia – various taxes – Language, literature and cultural contributions

Module 4.

Module 5.
- Manipravala and growth of Malayalam literature – Temple Arts.

Module 6.
- European rivalry for supremacy – Mysorean invasions – Establishment of British Colonial power – Early resistance.

Module 7.
- Land revenue policies – Mistaken notions – Popular resistance and their suppression.

Module 8.

Module 9.
- Towards Freedom: Struggle for Responsible government in Travancore and Cochin – National Movement in Malabar

Module 10.

State Eligibility Test - Syllabus 2016
Module 11.
- Political experiments - coalition governments - Decentralisation and Panchayati Raj - Women in politics

Module 12.
- Movements of the marginalized - Debates about development and the environment - Ecological concerns (Silent Valley, Plachimada, Depletion of Marine resources) - Waste generation and its disposal - Debates on Western Ghats

Unit IV
Ancient and Medieval Indian History

Module 1.
- Stone Age Cultures - Harappan Civilization - State and Society in Harappa - City Planning - Craft and Technology - Trade - Religions beliefs - Debates about the decline of Harappan Civilization

Module 2.
- Vedic period - Genesis of the term Aryan, language or race? The PGW culture - NBPW - Political organization - Pastoral economy and its later changes - Upanishadic world

Module 3.
- Persian and Macedonian Invasions - Emergency of monarchy in North India - Mahajanapadas - The First Magadha Empire - Expansion of agriculture - The Nandas - Growth of Varna System - Gandhara Art

Module 4.
- Establishment of Mauryan empire - Nature of Mauryan State (Recent Interpretations) - Social functions of Asoka's Dharma - Debates about the decline of the Mauryan Empire - Growth of mercantile classes and urban centers - Buddhism and Jainism - Satavahanas

Module 5.
- Consolidation under the Guptas - System of Administration - Developments in Science and Technology - Literature and Art - Bhagavatism - Devolution or decentralization?

Module 6.
- Political fragmentation after the Guptas - Harshavardhana - Land grants and agrarian expansion - Decline of trade and Urban decay - Social crisis and Kali - Indian Feudalism? - Foreign Military incursions to northern India

Module 7.
- Medieval India - Rise of Rajaput states - Society and Culture - Establishment of Delhi Sultanate - the nobility - the Ulema - Bhakti movement - Sufism - Art and architecture

Module 8.
- Classification of land : Iqta, Jagir - Revenue settlement - Irrigation - Craft production - Trade and monetization of economy

Module 9.
- South Indian kingdoms - Nature of polity - Segmentary State? - Chalukyas of Vatapi - Pallavas of Kanchi - The Rashtrakutas - Land revenue system under the Chola - Tank irrigation - Pandy of Madura - Landlordisms and Tenurial relations under the Vijayanagara

Module 10.
- The Bahmani Kingdom - Accounts of foreign travelers - impact of Islam

Module 11.
Unit V
Modern Indian History

Module 1.

Module 2.
• 1857 uprising – various interpretations – Tribal and other resistance movements

Module 3

Module 4.
• Instruments of social change – Evangelical Agencies – Education – Growth of a ‘middle class’ – creation of a public sphere

Module 5.
• Indian as a colonial economy – Growth of plantations – Commercialization of agriculture – Drain of wealth – Deindustrialization – Famines – Impact

Module 6.

Module 7.

Module 8.

Module 9.
• Integration of Princely States – Nehruvian Model – Planning for a new India – Features of India’s Foreign Policy.

Module 10.
• Industrialization – Growth of Agriculture and Green Revolution – Educational Progress – Science and Technology.

Module 11.
• Political developments after Nehru – Indira Gandhi and the declaration of internal emergency – Rise of regional political parties – Coalition experiments.

Module 12.

Unit VI
Select Themes World History

Module 1.
Module 2.

Module 3.
- Rise of nation states – Voyage of exploration and discovery – Renaissance – Reformation – the new science

Module 4.
- Commercial revolution – Mercantilism – Instruments of Monetary transactions - changes in agriculture.

Module 5.

Module 6.
- Industrial and agrarial revolutions - Technological progress – Social consequences.

Module 7.
- Modern revolutions: English, American, French, Russian and Chinese.

Module 8.
- Imperialism and the struggle for colonies – scramble for Africa – the Far East, 1870-1918

Module 9.

Module 10.

Module 11.

15. Home Science

Unit I
Human Development and Family Relations

Module 1.
- Child Development : definition, significance, scope, contemporary research., Methods of child study, Theories of child development, psychoanalytic theory, learning theory, conditioning, cognitive theory- Freud, Pavlov, Watson, Skinner, Piaget.

Module 2. Human Development
- life cycle approach- period, stages, characteristics, significance, needs, care of each stage - Prenatal, natal, neonatal, infancy and babyhood, early childhood, late childhood, adolescence-( pre, early and late), youth, adulthood, middle age, elderly.

Module 3.
- Problems and hazards in each stage of life cycle- Health issues-Prenatal-genetic, maternal, congenital, birthdefects, infections
- Natal- neonatal, infancy and child hood At risk babies, LBW, premature, multiple births, child hood ailments, accidents, infections, communicable diseases, nutritional
deficiencies, Barker’s hypothesis. Developmental delays, handicaps Behavioural problems,
- Social issues- Substance abuse, peer pressure, bullying, sexual abuse, delinquency, truancy, anti- social behavior
- mental health issues- anxiety, depression, suicide, phobia, identity crisis, defense mechanisms, projection, regression, repression, inhibition, substitution, rationalisation, poor self concept, lack of self confidence, and motivation identity crisis, poor performance and academic achiemement, insecurity, hierarchy of needs relationship with adults family and peers.
- Youth and Adulthood- life style related diseases, reproductive health problems.- infertility, PCOD., menopause related, osteoarthritis, osteoporosis, psychosomatic disorders, personality disorders,
- Problems in old age-, health problems-physical, lack of appetite, digestive problems, Arthritis poor muscular control/ co-ordination, sensory,, dementia, Alzhimers, ailments and diseases ,, lack of civic amenities- transportation, recreation, housing, retirement and related issues, poverty, economic crisis,. Psycho social-Abuse, neglect, abandonment loneliness, death and bereavement.

Module 4.
tourism, child pronography, children in disasters (natural and man made), children in substance abuse situation.

Module 5.
- Care. Food- breast feeding, weaning, food for preschool children, growing children, adolescent, adults and old age- nutritional needs, requirements, characteristics,, types, selection, modification of foods and diets,. Good food habits, wrong habits, modern trends, foods to be avoided.
- Health care- breast feeding- exclusive, predominant, bottle feeding, artificial feeding, complementary feeding, weaning. Infant milk substitutes, breast feeding promotion network in India (BPN), (GOBIFFF), Growth monitoring ORT, breast feeding ,immunization, family welfare, family education and food supplements (GOBIFFF), BPHI Arogyakiran, RSBY, RCH – definition, components, child survival, safe motherhood, adolescent care.
- Physical and mental care- habit formation, discipline Exercise, yoga practices, play, Recreation, aerobics, - counselling, need for providing guidance to children, parents and teachers. Mental health in children- Mal adjustments at home and school , Neurotic and psychotic behavior. Stress- major stressors in life. Stress in different stages of life, areas of stress, stress management in home, school and work place.

Module 6.
- Education- Early childhood education- preschool education- significance, objectives, major contributors, types, principles, pre requisites for preschools,qualities of a good teacher.
LBS Centre for Science & Technology

- Adolescents-significance, coeducation, life skill development, vocational guidance and education, preparation for economic independence and emotional independence. Career clinics; sex role identification, preparation for marriage and family relationship.
- Sex education- need and importance, areas to impart sex education, approaches-deviation, STD.
- Value education- civic sense, aesthetic appreciation, creativity, role of parents, family and teachers in inculcating values, attitudes, behavior and personality in children.

Module 7.
- Differently abled children- changing terminology, definition, classification, characteristics, causes, diagnosis, detection, manifestations- psychosocial problems- physically and, sensory challenged- visually impaired, hearing impairment, speech impairment. Mental retardation, gifted, autism, hyperactivity, learning disability, emotionally disturbed - Juvenile delinquency- truancy, antisocial elements, prevention, care and treatment, special needs, special education as per need, protection and management methods. Therapeutic guidance and counseling, preparation of parents, family members teachers and friends

Module 8. Marriage & Family Relations
- Marriage- significance, definition, functions, types, areas needing adjustments- family relationship, sex, parenthood, child care, finance, work participation, employment. Marital harmony, disharmony, crisis- divorce, separation, desertion, infidelity, infertility, mental illness.
- Family- definition, significance, types- family size, functions, roles of members- Traditional, modern and changing. Problems and crisis- illness, single parenthood, women headed family, family disintegration, children with problems. Parenthood- responsibility, preparation, child caring and rearing practices, types, attitudes, methods, parental influence on children’s behavior, value, attitude, outlook and personality; socialization in various family contexts in different cultures, population education.

Module 9. Advances & Assessment of children
- Detection- Foetal test, AGAR test, screening for abnormalities, ultra sound, amniocentesis, chronic villus sampling, test tube screening, stem cell assessment, Ponderal index, Development assessment, growth monitoring, growth chart, Trivandrum developmental screening chart (TDSC), Eliz health path for adolescents and adults (EHP) protection-, cognitive test, Draw a man test, projective techniques- Rorschach’s ink blot, role play, sentence completion, intellectual test, attitudinal test, aptitude tests achievement intervention, child apperception test

Module 10.
- Supporting & Welfare programmes and organisations for care, protection and prevention- UIP, ICDS, CSSM, Minimum need programme. Twenty point programme, Immunisation programmes, pulse polio campaginings, IRDP, UBSP, Adult literacy Mission, IMCI, IMPCH, Nutritional supplementation- Midday meal, supplementation nutrition programmes, special nutritional supplementation- IDD, Vitamin A prophylaxis, anaemia control programme, Folic acid programme, IMCD, ASHA workers, anganwadi workers, NRHM, NPAG.RSBYS, Arogyakiranam, Programmes for differently abled, child guidance clinics, child help line, Helpage India, free education for school students, special programmes for girl child, and girls of socially and economically backward children, FPAI, ICCW, KSCCW, NCERT, SCERT, ECCE, IAPE, NCPCR, CLF,

Unit II
Food Science, Nutrition and Dietetics

Module 1.
- History of food science, Basic five food groups (ICMR, 2011),. Nutritive value, composition, grading, selection, storage, products,. Beverages- alcoholic and non-alcoholic- energy contribution. Therapeutic contribution of spices and condiments. Pigments in foods. Recent advances in food science-Novel proteins, fabricated foods, textured foods, convenience foods, Ready to eat foods, sugar, fat and protein substitutes, rainbow nutrition. Anti nutritional factors in foods

Module 2.
- Methods of cooking, Physical and physiochemical changes in food in relation to cookery- colloids, emulsions, stabilisers. Denaturation, gelatinization, dextrinization, rancidity. Hydrogenation, winterization, smoking, culinary roles and effect of heat on cereals, pulses, egg, meat, fish, poultry, fruits and vegetables Methods to improve nutritive value of foods- sprouting, malting, fermentation, roasting, browning, fortification, enrichment.. Transfats, Ageing, stages of sugar cookery, shortening agents, leavening agents.

Module 3.
- Post harvest technology measures adopted by government to increase food production- Green revolution, blue revolution, white revolution, yellow revolution, brown revolution, silver revolution. Agents causing food losses- physical and Role of Save Grain Campaign and FCI in preventing food losses. Food security bill, 2011. New packaging materials.

Module 4.
- Food preservation -Methods- high temperature, low temperature, radiation, microwaves, preservation of cereals, pulses, egg, meat, fruits and vegetables. Food preservatives- natural and artificial, safe tolerance limits

Module 5.
- Food adulteration - Types, adulterants, methods to detect adulteration, health hazards of adulteration, measures to prevent adulteration- FSSAI, New initiatives by Government of Kerala for having safe food - Operation Ruchi.

Module 6.
- Food poisoning- Botulism, salmonellosis, Food spoilage by microbes, useful microbes-role of probiotics and prebiotics in health. Food fads and Fallacies. Food toxicants, Food additives, Food laws and standards, Food sanitation and quality control, nutrition labelling, misbranding, food testing laboratories.

Module 7.
- History of nutrition. Macronutrients - Carbohydrate, Protein, Fat - classification, functions, metabolism, digestion, absorption, sources, RDA, deficiency. Inborn errors of carbohydrate, protein and fat metabolism. Micronutrients-
- Vitamins- Naming of vitamins, Fat soluble vitamins- Vitamin A, D, E, K. B complex vitamins- Vitamin B_1, B_2, B_3, B_4, B_5, B_6, B_7, B_8. Folic acid, Biotin, Vitamin C – functions, sources, RDA, methods of assay, deficiency, toxicity, nutritional disorders and prevention.
Module 8.
- Fibre-classification, functions, sources, RDA, water in human nutrition.
- Water balance and imbalance.
- Electrolyte balance and imbalance.

Module 9.

Module 10.
- Paediatric Nutrition- LBW babies, premature babies- characteristics, complications, feeding pattern. Organ function test-Gastric, Liver and Kidney. Heamoglobinopathies. Assessment of nutritional status (ABCD) of adults (Direct and Indirect), infants. Subjective Global Assessment (SGA)

Unit III
Family Resources Management

Module 1.

Module 2.

Module 3.
- Work simplification- meaning and techniques. Mundell’s classes of changes. Basics of Time and Motion study- Pathway chart, Process chart, Operation chart. Labour saving gadgets- importance, selection, use and care. Concept of Ergonomics-
importance and application of ergonomic principles in selected areas- kitchen design, for the differently abled.

Module 4.

Module 5.

Module 6.

Module 7.

Module 8.

Module 9.

Module 10.

Unit IV
Textile Science and Fashion Designing

Module 1. Study of Fibres

Module 2. Study of yarns
- Definition, process of making fibre in to yarn- Hand, Mechanical-Conventional-Ring spinning, Direct-open end spinning and chemical. Classification of yarns-Types - simple, complex, textured, bi-component, biconstituent and blends, Twist, 4Count.

Module 3. Fabric structure
- Weaving- Loom parts and its operations,
- types of loom- projectile, rapier and jet loom.
• Basic weaves- Plain, twill and satin. Fancy Weaves-, Jacquard, dobby, lappet, clip spot, swivel, crepe and double cloth.
• Characteristics of woven fabrics – warp and weft, grain, selvedge, thread count and balance.
• Other methods of fabric construction- Knitting, Felting, Lace making, Laminating, bonding, and Braiding

Module 4. Dyeing, Printing and Finishes
• Classification of dyes Natural, Artificial- acid, basic, disperses, vat, naphthol, pigment, sulphur, and mordant. Methods of dyeing- stock, yarn, piece, product, cross and union dyeing- Types- beam, jig, winch, and jet.
• Printing: Direct- Roller, Block, Screen, Stencil and Spray painting. Resist- Tie & dye, Batik and Discharge.
• Finishes: Definition, purpose, classification, and types- singeing, bleaching, mercerization, calendaring, shrinkage control, sanforizing, crabbing, beetling, sizing, weighting, shearing, fulling, schrierenerizing, crepe, Special finishes-water proofing, flame proofing, and anti bacterial finish.

Module 5. Testing and Care of fabrics
• Testing of fibres, yarns, and fabric and importance of quality control and research institutions. Textile labeling, brand names, quality marks, registered trademarks, eco- marks, aftercare characteristics, labels, symbols and applications. Care of clothes, laundering different types of clothes, cleaning agents- methods of removing different types of stains.

Module 6.
• Fashion: Definition, concept, trend, style, classic, fad and silhouette. Principles, factors affecting fashion, fashion life cycle and Role of a fashion designer.

Module 7.
• Elements and Principles of garment designing: Psychosocial aspect of clothing, clothing and wears, Personality factors and clothing choices.

Module 8.
• Traditional Textiles and Embroideries of India:- Kashmiri shawl, Kashmiri Embroidery, Phulkari, Kanthas of Bengal, Jamdani, Brocades of Varanasi, Himru&Amru, Tanchoi Silk, Chanderi saree, Kanchipuram silk, Chikankari of Uttar Pradesh, Ikat of Gujarat and Pochampally, Patola of Gujarat, Chamba roomal, Tenia roomal, Paithani Srees, Kutch Embroidery, Mysore silk, Applique work of Andrapradesh, Kasuti Embroidery of Karnataka and Banjara Embroidery.

Module 9.
• Pattern making and Garment Construction:- Knowledge of basic process of garment construction- Tools and equipment for measuring, marking, cutting, pressing and finishing. Sewing machine- parts, operation and care. Taking body measurements, Principles and techniques involved in pattern making- Drafting, Draping and Flat pattern- Lengthening and shortening, increase and decrease of waist line and bust line, problem figures- Broad and narrow shoulder and importance of pattern grading. Steps in garment construction- Preparing fabrics for construction- shrinking and finishing, Marking, Cutting and Stitching-Seams, plackets, fasteners, collars, sleeves bias and its application.

Module 10.
• Fashion marketing and Merchandising:- Definition, Fashion marketing concept, fashion consumer behavior, 4 p’s in Marketing. Fashion business and Merchandising, Merchandising steps, Role of Merchandiser.
Unit V
Extension and Development Communication

Module 1. Extension Education & Social Change
- Meaning, definition, principles, objectives, philosophy. Social change- Conceptual analysis of society, rural and urban communities, social groups – classification of groups, nature, meaning and directions of social change.

Module 2.
- Rural basic institutions & Democratic decentralisation: - School as an agency of social change. School – community relationship. Co-operatives and its types, Panchayat- principles of democratic decentralization- 3 tier system of Panchayathi Raj- evolution, set up and function at central, state, district, block, village levels. 73rd and 74th Amendments in the Constitution.

Module 3.
- Rural Development – Approaches- concept, nature and purpose of administration in extension – meaning, types, principles, organisation, control and supervision, co-ordination and training. Leadership – types of leaders, Training institutes in Extension & Rural development- ETC, SIRD, NIRD.

Module 4.
- Programmes in action: Ongoing programmes and services for poverty alleviation, economic empowerment, nutrition, health and upliftment programmes for women and children. New initiatives of Govt of Kerala for the empowerment of youth, women, children and elderly.

Module 5.

Module 6.

Module 7.

Module 8.

Module 9.

Module 10.
- Social problems and issues – Population education- concepts and definitions, population explosion, illiteracy, unemployment, poverty. Social issues-alcoholism, prostitution, violence, suicide, drug abuse, RTI/STI, HIV/AIDS.
Unit VI
Research and Development
in Family and Community Science

Module 1. Research Methodology
- Types of research - basic, applied and action. Variables - independent and dependent, control and intervening. Sampling techniques - Random, systematic, stratified, purposive, cluster samplings. Methods and tools - Observation, Interview, Survey, Experimental, Clinical.
- Observation, Interview schedule, questionnaire, rating scales, attitude scale. Objectives - definition, significance, Hypothesis - meaning, importance, types - null and alternative.

Module 2. Statistics in Home Science Research:
- Measures of central tendency - average, mean, median, mode, quartile, percentile, range, SD. Data Collection - pilot study, primary and secondary data. Basic Statistical tools in data interpretation - t-test, ANOVA, chi square, Z test, correlation.

Module 3. Scientific Writing
- Different forms of scientific writing - articles in journals, research notes and reports, review articles, monographs, dissertations, bibliography, book chapters and articles. Parts of Research report - introduction, review of literature, methodology, result and discussion, summary and conclusion, abstract, reference. Graphs, tables, histograms, pie diagrams.

Module 4. Developmental trends and issues-
- Indicators of development in Kerala - Demographic profile - vital statistics, literacy rate, HDI, GDP, per capita income, poverty - BPL & APL families, environmental sanitation.
- Community health and nutritional status - life expectancy, morbidity, maternal and child health, baby friendly hospitals, neonatal clinics, mental health clinics, adolescent clubs, RCH, adolescent health, youth, adult and geriatric health care.
- Women empowerment - Education, Employment - Organized and Unorganized sectors, economic independence, legal literacy, Organizational support - SHGs and Microcredit - Kudumbasree, Mahila Samakya Society, KSWDC.
- Entrepreneurship and its development - definition, types, characteristics, factors affecting entrepreneurial growth - economic, social, cultural and personal factors. Role of SIDCO, IDBI, KITCO, SEWA, KSIDC, SIETI, KVIC, SSI.
- Developmental Issues - Unemployment, Migration from other places, decrease in agricultural production. Insufficient care homes and day care centres for children and elderly.

Module 5. New trends in Human development
- Management of differently abled children, Life skill education, guidance and counseling in schools, career clinics, school counselors, special and innovative approaches with children, Transactional analysis, play therapy, music therapy, art therapy, bibliotherapy, horticultural therapy, yoga and meditation, stress management techniques, aptitude tests, performance tests, advances in detection and assessment of problems, stem cell detection and therapy.

Module 6. New trends in Textiles

Module 7. New trends in Communication
- Information kiosks, interactive video and tele conferencing, tele text, virtual learning, tech talks, pod cast, multimedia presentations,
smart classes, e-learning and e-resources.
Cyber Extension – definition, advantages and limitations.

Module 8. Nutritional Advances
- Nano foods, Zero calorie foods, GM foods,
  Fortified foods, Nutrigenomics, Nutrigenetics, Neutraceuticals. Defence,
  High altitude nutrition, Space and Sports Nutrition.

- Modular kitchen, ergonomic furniture’s for home, school, institutions and community.
  Modern trends in landscaping, window decorations and furnishings and accessories.
  Recent trends in housing – green housing, geriatric housing.

Module 10. Eco concerns and Management
- Pollution- soil, land, air, water, noise. Waste-
  Unscientific Agricultural practices- Green house effect, global warming, major health hazard.
  Water management, Environmental protection- practices and programmes,
  Organic farming, safe food, environmental protection programmes.

16. Islamic History

Unit I
Islam Under the Prophet and Pious Caliphs

Module 1: - Arabia, the Cradle of Semites.
- Geographical features of Arabia-Ayyam al Arab – The Jahiliyah days – The Bedouin
  Life-pre Islamic poetry-Mua’llaqat -Status of women - Makkah and Ka’aba-Arabs as Semites

Module 2. Era of Prophet Muhammed
- Ancestry- Early Life- Harb al Fijar-
  Reconstruction of Ka’aba- Commencement of the mission- Opposition- Hijrah

Module 3. Prophet at Madinah
- Muhajirs and Ansars- Medinah Charter-
  Battles of the Prophet- Truce of Hudaibiyah-
  Victory over Makkah- Farewell Sermon-
  Prophet as a statesman

Module 4. Principles of Islam
- Articles of faith and Obligatory duties-Socio-
  political and Economic concepts-Principle of unity, equality and brotherhood-
  Status of Women in Islam

Module 5. The caliphate
- Evolution of Islamic republic -the caliphate-
  election of Abu Bakr-caliphal address-
  Apostasy movement and Riddah wars-
  Compilation of the Holy Qur’an

Module 6. Caliph Umar
- Nomination to caliphate- Political expansion at Byzantine and Persian provinces-
  Darul Sulh and treaty of Jerusalem- Administrative innovations -
  Consolidation of the republic

Module 7. Caliph Uthman
- Collegium and election to caliphate- Centrifugal tendencies- The Sabites and assassination of uthman-
  standardization of Qur’an- Formation of navy-

Module 8. Caliph Ali
- Assumption of caliphate – civil disturbances- Jamal and Siffin- Arbitration of Adhurh-
  origin of Kharijites-Shiism – Assassination of Ali

Module 9. Political Philosophy of Islam
- Caliph as the vicegerent of God- sovereignty of Allah- Bay’ath and Shurah council as
democratic manifestation

Unit II
Muslim dynasties of the Middle Ages

Module 1. The Umayyads
- Establishment of the dynasty- Mu’awiyyah-
  period of political transition – administration
and achievements- Battle of Karbala- Abdul Malik and Arabization policy- Walid I and political expansion- Umer Ibn Abdul Aziz- Battle of Zab

Module 2. The Abbasids
• Emergence of the dynasty- Abul Abbas Assafah – Al Mansur and consolidation of the empire-
• Foundation of Baghdad- Harun al Rashid- Barmakids- Al Ma’mun- Baithul Hikhmah- Mu’tazilites- Al Mutawakkil- social stratification- Ulema- Mawalis and dhimmis - Invasion of Hulagu and end of the dynasty

Module 3. Petty dynasties
• The Aghlabids-Conquest of Sicily-Arab Norman Culture- Tahirids- Safarids – Samanids- Safavids -Gaznawids- Buwayhids- Seljuqs-Fatimids- Ayyubids-Crusades-Mamluks

Module 4. Muslim rule in Europe
• Tariq Ibn Ziyad and conquest of Spain- Battle of Tours-Umayyad Amirate in Spain- Abdurrahman I,II&III ,Hakkam II –Learning centres- Cordova-Seville- Toledo

Module 5. Petty dynasties in Spain
• Muwahhids- Murabites-Nasrids- Fall of Granada –reconquista

Module 6. The Ottomans
• Origin- Age of Ghazis- Muhammed II- Conquest of Constandinople- Salim I and assumption of caliphate- Suleiman the Magnificent-Mahmud II- Abdul Majid and Tanzimat Reforms- Abdul Hamid II and constitutional experiment–the Young Turks

Module 7. The Ottoman systems and institutions
• Devsirme- Kapikulu- Yeni Cherri- vakayi Hayriye-Top Kapu Saray- Rumeli Hizar- Sheikhu Islamb- Beyler Beys- Koprulus-Millet administration-

Unit III
Intellectual contributions of Medieval Islam

Module 1. Religious Science
• Tafsir literature – Hadith literature – Sihah-sitta- Schools of Jurisprudence

Module 2. Language and literature
• Arabic grammar- Qitab al A’yn- Al Jahis-Arabian Nights-Qaleelah wa Dimnah- Shahnamah- Ibn zaydun-Muwashshah-Al Burdah-

Module 3. Philosophy and Education
• Translation Bureau- Baithul Hikhmah- Darul Hikhmah- Madrasssh Nizamiya- University of Cordova- Al Azhar university

Module 4. Mathematics and astronomy
• Algebra and Arabic numerals - Al Fazari- Thabit Ibn Qurrah- Al Battani- Al Beruni - Umar al Qayyam- Al Khawarizmi- Al Majriti- Al Zarqali-

Module 5. Medicine and Natural Science
• Botany- Ibn al Baythr and al Ghafiqi- Zoology- al Jahiz

Module 6. Physical Science and Geography
• Alchemy- Jabir Ibn Hayyan – Physics-Ibn al Haytam – father of Optics- Al Jazari- Geography-
• World cupola – Al Maqrisi- Yaquat- Al Bakri- al Idrisi- Ibn Jubair- Al Mazini- Ibn Batutta-

Module 7. Historiography
• Forms of Muslim historiography-Khaber-Maghazi-Sirah-Hauliyyah- Tabaqat-
• Early historians- Ibn Ishaq- Ibn Hisham- Al Waqidi- Al Baladhuri -Al Tabari- Al Masudi-
Module 8. Art and Architecture
- Mosque of Al Madinah- Dome of the rock-the Umayyad Mosque –Qaysr al Amrah-Bab al dahab- al Qubbah al Qadrah- The Rusafah Palace-Al Zahrah Palace- Al Cazar- Al hamrah- Al Azhar Mosque- Calligraphy-painting- Music-

Unit IV
Reform and Revivalist Movements in Islam
Module 1. Reformers of West Asia and Magh’rib
- Ibn Taymiyah-Mohammed Abduh- Rashid Rida- Ayatullah Qumeini- Ali Shariati

Module 2. Reformers of Indian sub-continent
- Shah Waliyullah- Syed Ahmed Shahid- Sir Syed Ahmed Khan- Sir Mohammed Iqbal -

Module 3. Reform Movements
- Wahabi Movement-Pan Islamism-Sanusi Movement- Ikhawan al Muslimin- Darul Uloom Deoband-Tabligh Jamaat-Ahl e Hadith-Jamaat e Islami- - En Nahda

Module 4. Movements and Leaders in Kerala

Module 5. Islamic Feminism
- Debates on Male domination, Polygamy, divorce , Hijab,public and political participation of women- Qasim Amin-Fatima Mernissi- Amina Wadud

Unit V
Islam in India
Module 1. Advent of Islam in India
- Indo-Arab trade relations-Cheraman perumal Tradition- Malik Ibn Dinar-Early Mosques-Conquest of Sindh-

Module 2. The Sultanate Period
- Ghaznavids- Ghorids- Qutbudin Aibek-Balban –Alauddin Khilji- Muhammed bin Tughluq- Firoz Shah Tughluq- Ibrahim Lodi-Bahmani Kingdom- sufism and Bhakti movement

Module 3. The Mughals

Module 4. Muslims in anti-colonial struggle

Module 5. Islam in Kerala
- The Portuguese , Zamorins , Ali Rajas and Kunjali Marakkars- The Mysorean interlude-British domination and Mappila outbreak-Malabar rebellion and Khilafat Movement- kerala Muslim Aikya Songhom- Islahi movement-Muslim League in Kerala Politics-

Module 6. Kerala Muslims- Cultural heritage
- Origin and development of Arabi-Malayalam- Mappila folk songs- Qazi
Mohammed- Moinkutty vaidyar- qu’ran Translation –Mayankutty Ilayah- Mappila traditional art forms- Educational developments- Muslim initiatives in journalism

Unit VI
Modern and Contemporary Muslim World

Module 1. Egypt

Module 2. Palestine and Israel
- Zionism –Hussain-Mc Mohan Correspondence- Sykes-Picot agreement- Balfour declaration- First World War and mandate System- Establishment of Israel- Arab –Israeli wars- PLO and Yasser Arafat- Oslo Accord and PNA- Hamas and Intifadah

Module 3. Iran
- Pahlavi Dynasty-Dr. Mohammed Mossadeq and nationalization of Oil industry- Iranian revolution of 1979- Ayatollah Qomeini-Islamic republic of Iran

Module 4. Iraq
- Anglo-Iraqi treaty of 1922- Ba’ath party- military coup of 1958- Saddam Hussain- Iran-Iraq war- Gulf war- U S invasion on Iraq – fall of Saddam Hussain

Module 5. Turkey
- First World War and Turkey- Dismemberment of Ottoman empire- Treaty of Sevares –Lausanne – Establishment of the republic- Mustafa Kemal and reforms- Post Kemalist Turkey-

Module 6. Modern Arab States and organizations
- Formation of Trans-Jordan, Syria and Lebanon- establishment of the Kingdom of Saudi Arabia-Arab League-OIC-GCC-OPEC.

17. Journalism

Unit I
Dimensions of Mass Communication

Module 1.
- Basics of Communication: Elements, Types and Process of Communication

Module 2
- Communication models of Aristotle, Lasswell, Shannon and Weaver, Osgood and Schramm, Dance, SMCR, Riley and Riley, Becker. Gate keeping /newsflow models.

Module 3
- Normative theories of the Press

Module 4
- Sociology of Communication, Individual differences, Social categories and Social relations perspectives

Module 5
- Psychology of Communication, Balance theories, Cognitive Dissonance theory

Module 6
- Theories on media effects, Cultivation theory; Stalagmite theory

Module 7
- Media Use patterns: Uses and gratifications theory; Ball-Rokeach and DeFluer’s media system and dependency model

Module 8
- McCombs and Shaw’s agenda-setting theory, Noelle-Nuemann’s spiral of silence theory
Module 9
- Basic Theories of Learning

Module 10
- Definition of Development Communication, Concepts and perspectives of development, Basic indicators of development, Characteristics of developing societies.

Module 11
- Sustainable development. Ethical perspective of development.

Module 12
- Models of development: Adam Smith, Ricardo, Malthus, Rostow, Marx, Mahatma Gandhi, Dominant paradigm of development.

Module 13
- Development communication models of Lerner, Schramm, Rogers

Module 14
- Role of media in development communication

Module 15
- Development Communication in India: Indian experiments and experiences

Module 16
- Five year plans, decentralization of power, welfare projects, women empowerment

Module 17
- Role of traditional and folk media in development communication

Module 18
- Inter-cultural communication: definition-process-philosophical and functional dimensions

Module 19
- Cultural symbols in verbal and non-verbal communication

Module 20
- Contemporary communication issues at national and international levels

Unit II
Media History & Laws

Module 1
- Origin and development of mass media in India

Module 2
- The Press in British India

Module 3
- Role of the Press in the freedom movement

Module 4
- Gandhi as a journalist

Module 5
- Pioneers of Indian journalism

Module 6
- Press in the independent India- press commissions and committees

Module 7
- Pioneers of Malayalam journalism

Module 8
- Brief history of mass media in Kerala

Module 9
- Constitution of India; fundamental rights-freedom of speech and expression and their limits

Module 10
- Brief history of press laws in India

Module 11
- Contempt of Courts Act 1971- Civil and Criminal law of defamation – relevant provisions of Indian Penal Code with reference to sedition, crime against women and children; laws dealing with obscenity

Module 12

Module 13
- Working Journalists and other Newspaper Employees (Conditions of Service & Miscellaneous Provisions), Wage Boards
Module 14
- Intellectual Property Right legislations including Copyright Act, Trade Marks Act and Patent Act;

Module 15.
- Cyber Laws

Module 16.
- Laws related to film and television

Module 17.
- Media ethics and related issues.

Module 18. International organizations and initiatives
- UNESCO, McBride Commission, NANA Pool,
- NWICO, WanIFRA, IPI, ABC etc.

Module 19. Indian organizations
- IIMC, Press Council, INS, PII, RIND, RNI, PIB, Editors Guild, IFWJ
- KUWJ, Kerala Media Academy

Module 20
- Media and human rights: Issues and concerns

Unit III
Reporting and Editing

Module 1. Understanding News
- Definitions, elements, news values, types of news: hard news and soft news.

Module 2. Reporting personnel
- Hierarchy, qualities and qualifications; duties and responsibilities; speed vs accuracy; objectivity and ethics; news bureau operations.

Module 3. Writing News Story
- Structure of a news story-inverted pyramid, hour glass and other narrative style

Module 4. Lead and body
- Different kinds of leads; changing styles of news writing. Influence of technology on news writing

Module 5. News Gathering
- News sources, techniques of gathering news-interviews; speeches; news beats; press releases from govt. and non-govt. institutions;

Module 6
- News agencies and handling wire copies.

Module 7
- Electronic news gathering.

Module 8
- Specialized Reporting: Skills and methods, significance, target audience

Module 9. Different categories of news
- Investigative and interpretative news, obits, etc.

Module 10
- Reporting court/parliament proceedings, business, sports, development, disasters, science and technology, environment, women and children, rural life and the deprived.

Module 11. Trends in journalism
- Citizen journalism, precision journalism; intimate journalism; planted stories and cheque book journalism; laid-back journalism; service journalism, embedded journalism, paid news, sting operation, data journalism, advocacy journalism, Influence of technology on reporting.

Module 12. Basic concepts and principles of editing

Module 13. News Room Management:
- News room hierarchy, Functions and responsibilities of Chief Editor, Associate Editor, Assistant Editor, News Editor, Chief Sub Editor, Sub Editor etc

Module 14.
- Copy tasting, Rewriting techniques, Running stories, space saving, Style sheet; Readability formulae, headline writing

Module 15
- Electronic editing and related software
Module 16. Introduction to typography
- Kinds of typefaces; classification and measurements setting styles.

Module 17
- Layout and Design, Textual and visual elements in newspaper papers.

- Selection of pictures, Photo Editing; writing cutline and caption writing

Module 19
- Glossary of Reporting

Module 20
- Glossary of Editing

Unit IV
Advertising, Public Relations, Corporate Communication & Media Management

Module 1
- History and evolution of advertising; Role of advertising in the marketing process; Functions of advertising

Module 2
- Types of advertising, Advertising agencies; Present trends in Indian advertising

Module 3
- Media laws concerning advertising

Module 4
- Ad organizations: Professional organisations in ad world: ASCI and its code of conduct

Module 5
- Elements of Advertisement

Module 6
- Structure of an advertisement/commercial; Types of headlines and body copy, copy appeals; Copywriting techniques; Layout and design; Visualisation

Module 7. Ad Campaigns
- Campaign planning; Rationale, goals and planning process; Evaluation of advertising campaigns

Module 8. Advertising Research
- Scope and objectives, research as a decision making tool

Module 9. Public Relations Concepts and definitions
- Evolution and growth of public relations

Module 10
- Propaganda, publicity, public opinion, lobbying

Module 11
- Functions of public relations, Target audience and publics of PR

Module 12
- Characteristics and qualifications of PR personnel

Module 13:
- Public Relations Campaigns and Tools, Press release, handouts, house journals, open house, exhibitions and demos.

Module 14
- PR campaign stages and planning - Organisation setup of PR departments/agencies;

Module 15
- PR in public / private sectors, Central and State PR Govt depts.

Module 16
- Public Relations organizations : PRSI, IPRA, PR as a management function, PR and crisis management, Functions of PR agency, PR counseling and Consultancy-Corporate Social Responsibility, PR and social auditing

Module 17
- Corporate communication: Definition, historical perspective, contemporary relevance. Facets of corporate communication-organizational communication,
marketing communication, management communication.

Module 18
• Functions of corporate communication - Employee Relations (ER) Investor Relations (IR), Media Relations (MR), Government Relations (GR), Customer relations (CR)

Module 19
• Media Management and ownership patterns, media policy formulation, organizational structure of media departments- advertising, business, circulation, personnel, production, news room etc. Media economics- budgeting, production, promotion, competition strategies.

Module 20
• Glossary of Advertising, Public Relations, Corporate Communication and Media Management

Unit V
Electronic and Digital Media

Module 1. Radio
• Broadcasting-Orig and growth, All India Radio. FM Radio stations, bands, Radio jockeys

Module 2.
• Programs News talks, interviews, documentaries and advertisements,

Module 3.
• Radio programme production tools

Module 4. Television
• Origin and Growth of Television, Television in India, An overview of television industry, measurement and rating techniques

Module 5. Formats of TV News packaging, Programs
• Structure and format in the new era, live talks, and Represented talk, Gossip Sitcoms and Soap Operas, Piece to camera

Module 6. Writing for Radio and Television
Broadcast Language
• Clarity, Brevity & Simplicity, The local identity, Rewriting, Basic Style rules, Voice of the station, Attributions, Headlines, Writing for visuals.

Module 7. Non-news programmes in radio
• formats, genres and language. Preparation of commentary, Research, Narrative devices, Debates, radio drama, radio interview, discussions, music and phone-ins

Module 8. Non news programmes in television
• TV production techniques, tools and formats, genres and language, Television interview

Module 9.
• Writing for TV Magazine Shows and Reality Television.

Module 10.
• Origin and growth of films, Milestones in cinema, Different genres of films

Module 11. Film movements
• German expressionist film, French surrealist film, Italian neorealism, French new wave

Module 12.
• Asian films and Eastern Europe films

Module 13.
• Indian and Malayalam Films

Module 14. Basic New Media Technologies
• LAN, MAN, WAN, World Wide Web etc. Origin and development of the Web, E-mail, Web, ownership and administration of Internet, types of Internet connection, internet protocols, Introduction to HTTP, HTML, XML, java script, jQuery, PHP, browsing and browsers, bookmarks, searching through directory, search engine

Module 15.
• Web design tools/software, Content Management System, Apache, Joomla etc.
Module 16.
- Security issues on the Internet - social, political, legal and ethical issues.

Module 17
- Online Journalism - definition, origin, development, and contemporary relevance.

Module 18.
- Differences from traditional journalistic practices.

Module 19.
- Social media and journalism, Future of online journalism.

Module 20.
- Glossary of Radio, Television, Film and digital media.

Unit VI
Communication Research

Module 1.
- Concepts of Communication Research.

Module 2.
- Nature and scope of communication research.

Module 3.
- Development of mass media research.

Module 4.
- Evaluation of communication research in India.

Module 5.
- Types of research.

Module 6.
- Qualitative Research methods.

Module 7.
- Quantitative Research methods.

Module 8.
- Topic selection - Relevance of the topic, Statement of problem.

Module 9.
- Literature review.

Module 10.
- Setting hypothesis and research questions.

Module 11.
- Sampling procedure.

Module 12.
- Data collection tools: development procedures.

Module 13.
- Data analysis and interpretation.

Module 14.
- Introduction to research statistics.
- Basic statistical procedure, Measures of central tendencies.

Module 15.
- Frequency distribution.

Module 16.
- Tests of significance.

Module 17.
- Research Reporting, Writing with style, avoiding common writing errors, readability of the manuscript, writing a research report, concluding the research report, writing exercises.

Module 18.
- Indexing, abstracting, citation and citation styles - APA & MLA.

Module 19.
- Current trends in mass communication research.

Module 20.
- Glossary of communication research.

18. Kannada

Unit I
Modern Literature

Module 1.
- Kannada Sahithya - important movements - Navodaya, Pragathisheela, Navyya, Dalitha, Bandaya, Mahila - Important forms - Kavya, Sannakathe, Kadambari, Nataka, Vimarshe.
Module 2.
- Pramukha prakaragalu - Bhavageethe, Sonet, Pragatha, Kathanakavana, Khandakavya, Mahakavya.
- Pramukha Krithigalu - English Geethegalu, Gilivindu, Pakshikashi, Gari, Madriya chiithe, Theredabagilu, Bhumigeetha, Saviraranadigalu, Nettaralli nenda hoo, Koraga mattu itara kavanagalu.

Module 3.

Module 4.
- Pramukha krithigalu - Indirabai, Mukajjiya Kanasugalu, Kanuru Subbamma Heggadithi, Nisarga, Shanthala, Samskara, Bekkinakannu, Kshitija, Chirasmarane, Kaatu, Baduku, Yaana, Kusumabale, Chandragiriya theeradalli, Abrahmana.

Module 5.
- Pramukha krithigalu - Kannataka Abhijnana Shakunthala, Shurasena Charithe, Vigada Vikramaraya, Tollugatti, Shokachakra, Kechaka, Gokula nirgamana, Tughalak, Sankranti, Sirisampige, Mahachatthra, Kodegalu, Drushti.

Module 6.
- Pramukha Krithigalu - Droupadiya Shreemudi, Kaavyakuthuhala, Soundrayasamekshesha, Shaktisharadeyamela, Yugadharma hagu Sahithya darshana, Navya vimarshe, Rakthirupane, Nijadani.

Module 7.
- Kannadadalli anuvaada sahithya - Pramukha anuvaditha krithigalu - Anatha pakshi, Choukattinamane, Agnisaaakshi, Berige neeru, Neeli chandira, Rajanagara, Ondu peeligeya telugu kathegalu, Tamulu Sannakathegalu, Ayda maleyala sannakathegalu, Kannadi.
Unit II
Ancient and Medieval Literature

Module 1.

Module 2.
- Pramukha kritigalu - Adipurana, Sahasabheema Vijaya, Karnataka Kadambari, Pampa Rayamangala, Ananthanatha Purana, Jagannatha Vijaya, Kabbigara Kava.

Module 3.

Module 4.
- Vachana mattu Keertane - Swarupa mattu Lakshana - Pramukha Vachanakararu mattu Keerthanakararu - Jedara Dasimayya, Allamaprabhu, Basavanna, Chennabasavanna, Siddarama, Akkamahadevi, Mukthayakka, Vyasara, Shripadara, Purandaradasa, Kanakadasa, Sarvajna.

Module 5.
- Ragale, Shatpadi, Tripadi mattu Sangatya - Pramukha Kavigalu - Harihara, Raghavanka, Chamarsa, Kumaravyya, Lakshmeesa, Kumaravalmiki, Chatuvittalanatha, Nanjundakavi, Deparaja, Sanchiya Honnamma, Rathnakaravarni.

Unit III
Folklore and Cultural Studies

Module 1.
- Janapada Swarupa - Vyapti - Vargeekarana - Kernatakadalli Janapada Adhyayanada Pravritthigalu - Swatantryapurva mattu Swantantryottara.

Module 2.
- Janapada Siddanthagalu - Puranamula, Bharathamula, Manavashastreeya, Manovishshanathmaka, Charithrika, Bougolika, Rachanika, Sandarbha, pradarshana.

Module 3.

Module 4.
Module 5.

Unit IV
Prosody and Literary Criticism

Module 1.
- Gana swarupa - Varnagana, Mathragana, Amshagana prabhedagalu.
- Prasabhedagalu - Laya - Yathi - Varnavrithagalu - Khyathakarnatakagalu - Shikharini, Mandakrantha, Mallikamaale.
- Shatpadi - Ugama, Lakshana mattu Vikasa - Shatpadiya Prabhedagalu.

Module 2.
- Amsha chandassu - Karnataka Vishaya jathi Chandorupagalu - Thripadiya ugama, lakshana, ithihasa.
- Hosagannada Chandassu - Swarupa, belavanige, mukhyya layagalu - Mudi, Padmagan, Anagatha, Ganaparivirthi.
- Hosagannada chandorupagalu - Sarala Ragale, Mahachandassu, Sonnet, Pragatha, Muktha Chandassu.

Module 3.
- Bharateeya Kavya Meemamse - Parikalpanagalu - Alankara - Reethi - Guna - Rasa - Dhwani - Vakrothi - Ouchithya.

Module 4.
- Sahithya vimarsheya pramukha vidhanagalu - Romantic, Rupanishta, Prayogika, Rachanika, Manovishleshnhathmaka, charithrika, Marxvadi, Streevadi, Vasahathothara.

Unit V
History of Kannada Language and Linguistics (General and Dravidian)

Module 1.
- Kannada bhasheya prachinathe - Shasanagalalli ullekha, Karnataka padada nishpathi - Kannada bhasheya vividha hanthagalu - Poorvada Halagannada, Halagannada, Nadugannada, Hosagannada.
- Kannadada pradeshika mattu Samajika Prabhedagalu - Kannada sampradayika Varnamaale, Dhwanimagalu mattu Akrithimagalu.

Module 2.
- Sarvanamagalu - Bagegalu, Abhivyapaka, Vyavarthaka, Athmarthaka - Entu
Module 3.
- Language - Definition - Language and Linguistics - the nature and scope of Linguistics, Braches of Linguistics.
- Classification of languages - morphological, Geneological, linguistic changes, types of linguistic borrowings, syntactic changes.

Module 4.

Unit VI
Research Methodology, Textual Criticism, Journalism and Computer knowledge

Module 1.

Module 2.

Module 3.

Module 4.
- Lankeshara Pathrika baravanigegalu - Sampadakeeya, Saddi baravanige,
Module 5.
- Computer - Computarina Bhagagalu - Monitor, CPU, Printer, Scanner, Pen drive, CD, DVD, Speaker.
- Softwaregalu - Microsoft Word, Excel, Pagemaker, Photoshop, Antivirus - Kannada Thanthramshagalu - Nudi, Baraha.
- Internet, Website, Blog, Browser, Email, Social Network.

19. Latin

Unit I
Grammar

Module 1.
- Declensions of Nouns.

Module 2.
- Declensions of Pronouns.

Module 3.
- Declensions of Adjectives.

Module 4.
- Conjugation of Regular Verbs.

Module 5.
- Conjugation of Irregular Verbs.

Module 6.
- Conjugation of Deponent Verbs.

Module 7.
- The subject and concords of nouns, verbs, adjectives and pronouns.

Module 8.
- Government of nouns, adjectives and verbs.

Module 9.
- Degrees of Comparison.

Module 10.
- Adverbial expressions of time & place.

Module 11.

Unit II
History

Module 1.
- “English in its Latin Context” by Prof. James W. Earl.

Module 2.
- “Latin: The Universal Language of the Church” by Archbishop M. Soosa Pakiam.

Module 3.
- “Latin and Legal Language” by Dr. Sebastian Paul.

Module 4.
- “Influence of Latin on English Language and Administration” by Prof. P. L. Josey.

Unit III
Prose

Module 1.
- “Abhrami Supremum Sacrificium” from Liber Genesis of *Biblia Sacra Vulgate*.

Module 2.
- “Samaritanus Bonus” from Evangelium Secundum Lucam of *Biblia Sacra Vulgate*.

Module 3.
- “Caritas Patiensest” from Epistola Beati Pauli Apostoliad Corinthos Primaof *Biblia Sacra Vulgate*.

Module 4.

Module 5.
Unit IV
Poetry

Module 1.
• “Dominus Regit Me” from Liber Psalmorum of Biblia Sacra Vulgate.

Module 2.

Module 3.
• “Mahatma Gandhi” by Paulus Lanthaparambil from CanticaCycni

Module 4.

Module 5.

Unit V
Short Story & Drama

Module 1.
• “David et Goliath” from Liber Primus Samuelisof Biblia Sacra Vulgate.

Module 2.

Module 3.

Module 4.

Module 5.
• “Plautus’ Amphitruo, Section 3C” from


Unit VI - Translation
(Latin to English and English to Latin)

Module 1.
• Declensions 1 – 5: Exercises Number 4 – 11, 18 – 30 & 41 – 43 (Both A & B)

Module 2.
• Adjectives of the First & Second Class: Exercises Number 12 -17 & 34 -38 (Both A & B)

Module 3.
• Comparison of Adjectives: Exercises Number 44 – 49 (Both A & B)

Module 4.
• Numeral Adjectives: Exercises Number 50 – 52 (Both A & B)

Module 5.
• Pronouns: Exercises Number 53 – 58 (Both A & B)

Module 6.
• Adjectives Used as Nouns: Exercises Number 59 (Both A & B)

Module 7.
• Infinitives Used as Nouns: Exercises Number 60 (Both A & B)

Module 8.
• Active Voice, Subjunctive Mood: Exercises Number 61 – 67 (Both A & B)

Module 9.
• Passive Voice, Indicative Mood: Exercises Number 68 – 75 (Both A & B)

Module 10.
• Passive Voice, Subjunctive Mood: Exercises Number 76 – 79 (Both A & B).
20. Malayalam

ജാഗത്തി 1. പ്രായ

Module 1.
• പരിശീലനം - സിലേറ്റികൾക്ക് - മേണ്ടാ-വളഭരിക്കപ്പെട്ട - ഒരുവാർശം - 

Module 2.
• പ്രായ - തിരികെ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 3.
• അന്തരിതഭാഷ - തിരികെ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 4.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 5.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 6.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 7.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 8.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 9.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - വാക്ക് - 

Module 10.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - 

ജാഗത്തി 2. പ്രായ

Module 1.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - 

Module 2.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - 

Module 3.
• അന്തരിതഭാഷ - ആവശ്യപ്പെട്ടിരിക്കുന്ന - 

State Eligibility Test - Syllabus 2016
Module 4.
- Social Science – International Relations - History - International Law - Economics - Business Administration - Management - Marketing - Finance

Module 5.
- Social Science – Philosophy - Political Science - International Relations - Sociology - Social Work - Anthropology - Psychology - Sociology

Module 6.
- Social Science – Law - International Law - Criminal Justice - Human Rights - Gender Studies - Environmental Studies - Urban Planning - Development Studies

Module 7.

Module 8.

Module 9.
- Social Science – Economics - Business Administration - Management - Marketing - Finance - International Relations - History - International Law

Module 10.
- Social Science – Mathematics - Statistics - Computer Science - Information Technology - Data Science - Artificial Intelligence - Machine Learning - Cybersecurity

Module III

Module 1.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 2.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 3.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 4.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 5.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 6.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics

Module 7.
- Mathematics - Calculus - Linear Algebra - Probability - Statistics
Module 8.

Module 9.

Module 10.

Module 1.

Module 2.

Module 3.

Module 4.

Module 5.
Module 3.
•  പഠനമേളകള്‍ - ക്രിയകളെടുക്കുക - അഭിപ്രായമാക്കുക - മേഖലകള്‍ - ക്രമത്തിന്റെ താളുകള്‍ - സാമൂഹ്യസാമൂഹ്യജീവിതം - അനുകലനം ചെയ്യുക.

Module 4.
• പഠനമേളകള്‍ നിടുത്തപ്പെടുത്തുക - ക്രിയകള്‍ പ്രത്യേകതയാക്കുക - അഭിപ്രായങ്ങള്‍ തിരിച്ചറിഞ്ഞുക -സമൂഹാനുമാനം - സംസ്കാരാനുമാനം - ഭൂരിപ്പൂർണ്ണം - സാമൂഹ്യജീവിതം.

Module 5.
• ക്രിയ അനുവദ്യം - ക്രിയകള്‍ പ്രസ്തുതിക്കുക - അഭിപ്രായങ്ങള്‍ തിരിച്ചറിഞ്ഞുക - സാമൂഹ്യസാമൂഹ്യജീവിതം - അനുകലനം നടത്തുക.

Module 6.
• പഠനമേളകള്‍ - കൃത്യതയും മേഖലയും - സംസ്കാരം - പ്രവര്‍ത്തനം - പ്രസ്തുതിക്കുക - അടിസ്ഥാനം - അനുകലനം - ശാസ്ത്രശാസ്ത്രജ്ഞന്റെ.

Module 7.
• അനുയോജ്യമായിരിക്കുക - ക്രിയകള്‍ക്ക് സമൂഹത്തിന്‍റെയും സ്വന്തം സാമൂഹ്യജീവിതം നൽകിയിരിക്കുക - അഭിപ്രായങ്ങള്‍ നടത്തുക - സാമൂഹ്യസാമൂഹ്യജീവിതം - അനുകലനം - രേഖപ്പെടുത്തുന്നത് - ക്രിയ രേഖ അനുവദിക്കുന്നത്.

Module 8.
• അനുയോജ്യമായിരിക്കുക - ക്രിയകള്‍ക്കെതിരെ തള്ളിക്കളഞ്ഞുക - സാമൂഹ്യക്രമം - അവധിക്കെതിരെ - അനുവാദം പ്രഖ്യാപിക്കുക - ക്രിയകള്‍ക്ക് വരാന്തുക - ലബ്ധിരഹിതമായിരിക്കുക - ക്രിയ രേഖപ്പെടുത്തുന്നത് - അനുകലനം ചെയ്യുന്നത്.

Module 9.
• നമ്പരൊമ്പുകള്‍ക്കെതിരെ അവധിക്കെതിരെ പ്രഖ്യാപിക്കുന്നത് - എല്ലാ സാമൂഹ്യക്രമങ്ങള്‍ക്കെതിരെ പ്രഖ്യാപിക്കുന്നത് - മൊണ്ടൈറ്റുകൾ വരാന്തുക - വളരെ പ്രഖ്യാപിക്കുന്നത് - ലബ്ധിരഹിതമാണ്.
Module 7.

Module 8.
- Coordinates of points in plane and space. Distance in terms of co-ordinates. Determination of coordinates of points on a line in terms of two points. Slope of a line. Representation of curves in a plane as equations - straight lines, circles and conics. Geometric and algebraic properties of their equations. Direction cosines and direction ratios of a line in space. Coplanar and non-coplanar lines. Equations of lines, planes and spheres in both cartesian and vector forms.

Module 9.
- Basic Combinatorics - Pigeonhole principle, permutations and combinations. Random experiment, sample space, events, probability, discrete Probability, conditional probability and independent events.

Module 10.

Module 7.
- Convergence and limits of sequences and series of real numbers. Geometric and harmonic series. Sequences and series of real functions, point-wise and uniform convergence. The exponential series. Limits, continuity, directional and total derivatives of functions of several variables.

Module 8.

Module 9.
- Basic properties of complex numbers. Absolute value. Polar form of a complex number.

21. Mathematics

Unit I
Fundamental Concepts

Module 1. Sets and functions

Module 2. Analytic geometry
- Coordinates of points in plane and space. Distance in terms of co-ordinates. Determination of coordinates of points on a line in terms of two points. Slope of a line. Representation of curves in a plane as equations - straight lines, circles and conics. Geometric and algebraic properties of their equations. Direction cosines and direction ratios of a line in space. Coplanar and non-coplanar lines. Equations of lines, planes and spheres in both cartesian and vector forms.

Module 3. Elementary calculus
- Limits of functions, di erentiability, and derivative as slope. Derivatives of polynomial functions, exponential function and trigonometric functions. Derivatives of sums, products, composite and inverse functions. Increasing and decreasing functions, local extrema, and simple applications. Integration as anti-di erentiation, integral as sum. Length of curves, area under curves and volume of solids of revolution using integration.

Module 4. Probability
- Basic Combinatorics - Pigeonhole principle, permutations and combinations. Random experiment, sample space, events, probability, discrete Probability, conditional probability and independent events.

Unit II
Real and Complex Analysis

Module 1. Basic concepts in Real Analysis
- Convergence and limits of sequences and series of real numbers. Geometric and harmonic series. Sequences and series of real functions, point-wise and uniform convergence. The exponential series. Limits, continuity, directional and total derivatives of functions of several variables.

Module 2. Integration and basic Measure Theory

Module 3. Basic concepts in Complex Analysis
- Basic properties of complex numbers. Absolute value. Polar form of a complex number.

Module 4. Complex Integration

Unit III
Abstract Algebra

Module 1. Groups

Module 2. Rings

Module 3. Fields

Unit IV
Linear Algebra and Matrix Theory

Module 1. Matrix Theory

Module 2. Vector spaces
- Vector spaces over an arbitrary field, real numbers and complex numbers. Linear independence and dependence. Basis and dimension. subspaces and quotients. Direct sums of vector spaces. Geometry of points, lines and planes in R2 and R3 in terms of subspaces.

Module 3. Linear Transformation
Unit V
Number Theory and Differential Equations

Module 1. Number theory

Module 2. Ordinary Differential Equations

Module 3. Partial Differential Equations
- Solution of the equation of the form \( Pdx + Qdy + Rdz = 0 \). Charpits and Jacobis method for solving first order PDEs, Classification of higher order PDEs (parabolic, elliptic and hyperbolic types). General solution of higher order PDEs with constant coefficients. Method of separation of variables. Wave equation, Heat equation and Laplace equation.

Unit VI
Topology and Functional Analysis

Module 1. Metric Topology
- Metric spaces. Discrete metric. Euclidean metric on \( \mathbb{R}^n \) and \( \mathbb{C}^n \). Supremum metric on the set of real valued functions and complex valued functions on a closed interval. Limit points and convergence of sequences in a metric space. Cauchy sequences. Complete metric spaces. Completion of a metric space. Cantors intersection theorem and Baires category theorem. Compact subsets and connected subsets of \( \mathbb{R} \) and \( \mathbb{C} \). Heine-Borel theorem for \( \mathbb{R}^n \).

Module 2. General Topology

Module 3. Normed linear spaces

Module 4. Inner product spaces

22. Music

Unit I

Module 1. History of music
- Period I – Natya Sastra to Sangita Ratnakara
- Period II – Chaturdandi prakasika onwards
Module 2. Vedic Music
- Sama gana and its characteristics

Module 3. Lakshana grandhas
- Natya Sastra
- Brihaddesi
- Swaramela Kalanidhi
- Chaturdandi Prakasika
- Sangita sampradaya pradarsini
- Sangita Chandrika
- Chilappathikaram

Module 4.
- Different mela systems propounded by various Lakshanaakaras

Module 5. 72 Sampoorna melakarta scheme
- Asampoorna mela paddathi
- Katapayadi formula
- Bhoota sankhya
- Model shift of tonic
- Vivadi melas

Module 6. Composers and Vaggeyakaras of pre-Tyagaraja period
- Annamacharya
- Bhadrachalam Ramadas
- Purandara dasar
- Narayana thirthar
- Kshetrajna
- Jayadeva
- Arunchala kavi
- Arunagiri nathar
- Sadasiva brahmendra
- Uttukkad Venkatasubhayya

Module 7. Raga lakshanas of the melakartas
- Todi
- Mayamalava gaula
- Chakravakam
- Natabhairavi
- Keeravani
- Kharaharapriya
- Gaurimanohari
- Charukesi
- Harikamboji
- Sankarabharanam
- Subhapantuvarali
- Dhenuka
- Ramapriya
- Pantuvarali
- Shanmughapriya
- Lathangi
- Vachaspathi
- Kalyani
- Dharmavati
- Simhendramadhyamam
- Hemavati

Module 8.
- Detailed knowledge of the classification of the instruments in general.

Unit II

Module 1. Music and Temples
- Role of music in temples
- Ritualistic music
- Musical Iconography
- Musical stone pillars

Module 2. Musical inscriptions in Kudumamalai and thirumayam

Module 3. Talas
- Sapta talas
- Shadanagas
- 35 talas
- Shodasangas
- Scheme of 108 talas
- 175 talas
- Navasandhi talas
- Sarabhanandana tala

Module 4. Origin and evolution of musical forms
- Prabandhas – Geethaprabandhas and Vadyaprabandhas
- Study of the structure of the musical forms Jathisvaram,
- Svarajathi, Varnam, Kriti, Ragamalika, Padam, Javali, Thillana
- Dance musical forms

Module 5. Evolution of musical concerts

Module 6. Composers and Vaggeyakaras of Tyagaraja period
- Tyagaraja
- Dikshitar
- Syama Sastri
Module 7. Raga lakshanas
- Mohanam
- Hamsadhvani
- Kambooji
- Bilahari
- Neelambari
- Kedaragaula
- Devagandhari
- Nattakurinji
- Hindolam
- Malayamarutham
- Reetigaula
- Ananda bhairavi

Module 8. Detailed knowledge of the stringed instruments of South and North with playing technique
- Tumburu
- Ektar
- Veena
- Violin
- Gottuvadyam
- Sarangi
- Sitar
- Sarod

Module 4. Group kritis of Tyagaraja, Dikshitar, Syama Sastri and Swathithirunal

Module 5. Treatment of music in geyanataka, nrityanataka, bhagavatamelanataka, yakshagana and kathakalakshepam

Module 6. Composers and Vaggeyakaras of post Tyagaraja period
- Pattanam Subrahmanya Iyer
- Ramanad Sriviniasa Iyengar
- Mahavaidyanatha Iyer
- Neelakantha Sivan
- Chengalvaraya Sastri
- Mysore Vasudevacharya
- Periyararathinooor
- Ambujam Krishna
- Muthuthandavar
- Koteswara Iyer

Module 7. Raga lakshana
- Abhogi
- Natta
- Gaula
- Arabhi
- Varali
- Sri
- Poorvikalyani
- Bahudhari
- Sahana
- Saveri
- Bhairavi
- Manirangu
- Valichi
- Kannada
- Saraswathi

Module 8. Detailed knowledge of the wind instruments of North and South with playing technique
- Flute
- Nagaswaram
- Ottu
- Harmonium
Unit – IV
Module 1. Bharata’s experiment dhruva veena and chala veena, cycle of 4<sup>th</sup> and cycle of 5<sup>th</sup>
Module 2. Music and mathematics
Module 3. Geographical factors and their influence
Module 4. Music and physiology – Larynx and Ear
Module 5. Yazh – its origin evolution and decline
Module 6. Composers and Vaggeyakaras of modern period
- G.N. Balasubrahmaniyam
- Muthayya Bhagavatar
- Papanasam Sivan
- T. Lakshmana Pillai
- K.C. Kesava Pillai
- Ennapadam Venkitarama Bhagavatar
- Mysore Maharaja

Module 7. Ragalakshana
- Saranga
- Chenchurtti
- Lalitha
- Surutti
- Navarasa Kannada
- Bhoopalam
- Sudha Saveri
- Kanada
- Nagasvaravali
- Amrita Varshini
- Bhowli
- Hameerkalyani
- Ranjini
- Athana
- Behag
- Kapi

Module 8. Detailed knowledge of the percussion instruments of South and North
- Mridangam
- Tabala
- Pakhwaj
- Ghatom
- Morsing
- Tavil
- Kanchira

Unit – V
Module 1. Raga Classification in ancient Tamil music
Module 2. Musical aspects of tevaram, thiruvachakam, thirupagazh and divyaprabandham
Module 3. Raga classification of Hindustani music – Raga ragini parivara system
Module 4. Time theory of ragas
Module 5. Raga and rasa Madura bhakti and Navavidha bhakti
Module 6. Varities of folk concerts – folk games and festival songs
- Kuravanji natakam
- Bommalattam
- Kummi
- Kolattam
- Thiruvathirakkali
- Chinnamelam
- Periyamelam
- Marriage songs
Module 7. Sopana sangeetham and its characteristics, difference between sopana sangeetham and classical music
Module 8. Music in kathakali -
- instruments used in it
- Panchavadya, tayambaka
- Talas used in it

Unit – VI
Module 1. Modern trends in Music
- Style of performing
- Digital recording system
- Modern technologies
- Electronic media
- Modern requirements for an acoustical auditorium
Module 2. Music and Yoga
Module 3. Research
- Journals and e-journals
- Books
- Periodicals

Module 4. Value of Music
- spiritual, intellectual, emotional & Cultural

Module 5. Musical honours and titles

Module 6. Music Education
- Gurukula System
- Curriculum System

Module 7. Music appreciation and criticism

Module 8. Music Therapy

23. Philosophy

Unit I
Classical Indian Philosophy

Module 1. The Vedas
- Evolution from polytheism to monism, Vedic deities- concepts and names, journey to monism-intermediary concepts like Ṛ, ta and Tad Īkam.

Module 2. Prasthāna traya
- The Upanishads- Ekātma vāda, Brahman-Atman identity, The four Mahāvākyas and their sources - Āham Brahmasmi, Tattvameśi, Prajñānam Brahma, Ayamātmān Brahma.
- Brahmasutra - Structure of the text - pāda, adhyaya, adhikāraṇa.
- Bhagavad Gīta - Karma Yoga, Śhitaprajña as the concept of self-management, Lōkasamgraha as an ethical concept.

Module 3.
- Vedanta ārāṇya - Advaita - Recognition of Śabda Pramāṇa, Satta traya (only definition), Saprapancāvāda, Nisprapancāvāda, Māya, Adhūṣa, Jīvanmukti.
- Viśistadvaita - Cit and Acit - relationship and distinction, Apnākṣiddhi (definition).
- Dvaita - Nature and scope of dualism, Concept of Pāncabhedās, Vidēhamukti.
- Śukhādvaita of Vallabha and Dvaitādvaita of Nimbarka - textual sources.

Module 4.
- Systems - Lokayata - Materialism, denial of Atman and God, Concept of mind - epiphenomenalism.
- Jainism-Tīrthankaras, Anēkāntavāda, Syādvāda.
- Buddhism - Ārya Satya, Atāngamārga, Pratītyasamutpāda, Kṣanikavāda, Nairatmyavāda, Nirvāna and Moks, a comparison.

Module 5.
- Nyāya Vaiśeṣika - Primary textual sources, concept of pramāṇa, as, doctrine of causation, Vaiśeṣika doctrine of padārthas.
- Samkhya Yoga - Nature and scope of dualism, concept of evolution, comparison between prakṛti-parināmavāda and vivartavāda.
- Aṣṭāngayoga - Structure of Patañjali’s Yogasutras, Sāraḥ pāda, Śāhāna pāda, Vībhūti pāda, Kaivalya pāda.
- Purva Mimamsa - Textual sources, dharma, epistemological realism, pramāṇas accepted by Prabhakara and Kumarila Bhatta.

Module 6.
- Anandavardhana - Threefold classification of dhvani - vastu, alamkāra and rasa (definition)

Unit II
Contemporary Indian Philosophy

Module 1.
- Indian Renaissance Movement - background, concerns and goals, prominent leaders and organizations.

Module 2.
- Sri Aurobindo- Evolution and involution, Gnostic being, Integral Yoga.
- Ramana Maharshi - Concept of Jīvanmukta.
Module 3.
- Rabindranath Tagore - Poet's religion, the ideal of creative unity, the concept of Jeevandevata.
- Dr. S. Radhakrishnan - Nature of reality, intellect and intuition.

Module 4.
- MK Gandhi - Truth and non-violence - end and means relationship, the economic and ethical bases of Sarvodaya, Satyagraha as the victory of soul-force over physical force.
- J Krishnamurti - Freedom from the known, truth is a pathless land.

Module 5.
- BR Ambedkar - Caste as an unnatural institution - Sree Narayana Guru and Chattampi Swamikal - Critique of caste on the basis of Vedanta Darsana.

Unit III
Western Philosophy

Module 1.
- Greek Philosophy - Pre-Socratic Age - the problem of being and becoming substance and change with reference to Parmenides and Heraclitus.
- Socrates - Characteristics and aim of Socratic Method.
- Plato - Idealism, object-idea distinction, concept of reality, Cardinal Virtues, Concept of social organization - comparison with Indian Varna System.
- Aristotle - form and matter, doctrine of fourfold causation.

Module 2.
- Medieval Philosophy - St. Anselm - Faith and reason, St. Thomas Aquinas - Proofs for the existence of God, Occam's razor - definition and application.

Module 3.
- Modern Thinkers - Francis Bacon - The four idols.
- Descartes - Cartesian method - characteristics, substance dualism, interactionism and occasionalism.
- Spinoza - Monism, psychophysical parallelism, substance and modes.
- Leibniz - pluralism, Monadology, Freestablished harmony.
- John Locke - Arguments for the rejection of innate ideas.
- Berkeley - subjective idealism, esse est percipi.
- David Hume - skepticism, denial of substance and causality, epistemological doubt of Hume in comparison with methodological doubt of Descartes.

Module 4.
- Immanuel Kant - Original works, Transcendental Aesthetics - metaphysical exposition of space and time, twelve principal categories and judgments, phenomena-noumenon distinction, Kant's agnosticism compared with Antirachaniya concept.
- Hegel - Dialectical explanation of reality, Absolute Idea, comparison between the dialectics of Hegel and Plato.
- Marxism - dialectics of history, concept of class struggle and the dictatorship of proletariat.

Unit IV
Contemporary Western Philosophy

Module 1.
- Edmund Husserl - Intentionality of consciousness, Phenomenological reduction

Module 2.
- Existentialism of Kierkegaard - three stages of existence, subjectivity of truth, freedom and choice.
- Gabriel Marcel - Freedom - positive and negative sense, concept of creative fidelity, distinction between problem and mystery.
- Sartre - Important works, existence precedes essence, the three levels of Being, freedom and responsibility.
- Nietzsche - major works, will to power, master-slave morality, concept of Superman.

Module 3.
- Martin Heidegger - Major works, Dasein.

Module 4.
- Gottfried Frege - Concept-script distinction, sense and reference.
Module 5.
- Karl Popper - Major works, Falsificationism - definition, the demarcation between science and non-science.
- Feynman - Epistemological anarchy, incommensurability thesis.

Module 6.
- Ordinary language philosophers - Gilbert Ryle - major works, category mistake, J. L. Austin - performatives, speech act theory.

Module 7.
- Structuralism - Saussure - signifier/signified, synchronic/diachronic langue/parole distinction.
- Post-structuralism and Postmodernism - Derrida - decentering, fluidity of meaning, Deconstructive style of reading, critique of logocentrism, difference.

Module 8.
- New Left Critical Theory - Antonio Gramsci - important works, concept of hegemony, critique of 'economism'.
- Althusser - Repressive state apparatus (RSA) and Ideological state apparatus (ISA).

Unit V
Logic
Module 1.
- Logic as normative science of reasoning, induction and deduction-relationship and differences.
- Inference - immediate and mediate.
- Relations of opposition of propositions based on the Square.
- Eduction - conversion, obversion, contraposition - definition and exercises.

Module 2.
- Syllogism - Types - categorical, hypothetical, disjunctive and dilemma - rules and fallacies, exercises to identify violation of rules and resulting fallacies.

Module 3.
- Induction - induction - deduction correlation in scientific method.
- Hypothesis - formation, verification and testing, qualities of a good hypothesis, canons of the experimental methods of J. S. Mill.
- Analogy - Weak and strong, primary and secondary analogues.

Module 4.
- Symbolic Logic - Variables and Constants - definition and symbols, Truth and validity, Statements forms - tautology, contradictory and contingent forms.
- Basic truth - tables - Nine rules of inference, De Morgan's theorems.

Unit VI
Ethics
Module 1.
- Axiology - Definition, concept of value, value/virtue distinction, intrinsic and instrumental values.

Module 2.
- Ethical theories - Virtue ethics - Arete and Eudemonia - definition.
- Deontological and Teleological approaches - Kant's concept of categorical imperative, necessity of God as a postulate of morality.
- Pragmatism - Prominent representatives, workability as the criterion of truth/good, instrumentalism.

Module 3.
- Metaethical Theories - Intuitionism, Emotivism, Prescriptivism and Descriptivism (definition and prominent representatives).
- Naturalism - non-naturalism distinction, G. E. Moore's concept of good, naturalistic fallacy.
24. Physics

Unit I
Module 1. Mathematical physics

Module 2. Classical Mechanics

Unit II
Module 1. Quantum Mechanics

Module 5.
- Environmental ethics - Why environmental ethics is significant today? Critique of Anthropocentrism and technocentrism.
- Deep ecology of Arne Naess - differences between deep and shallow ecology, Ecosophy - T, biospherical egalitarianism.
- Ecological resistance movements in India - Chipko and Narmada Bachao Andolan - inspirations and goals.

Module 6.
- Cyberethics - The Ten Commandments of Computer Ethics proposed by the Computer Ethics Institute, the problem of personal privacy in cyber world.

Module 2. Statistical Mechanics

Unit III

Module 1. Electromagnetic Theory

Module 2. Atomic and Molecular Physics

Unit IV

Nuclear and Particle Physics
- Basic nuclear properties: size, shape and charge distribution, spin and parity. Binding energy, semi-empirical mass formula, liquid drop model. Nature of the nuclear force, form of nucleon-nucleon potential, charge- independence and charge- symmetry of

Unit V

Condensed Matter Physics

Unit VI

Electronics

25. Political Sciences

Unit I

Modern Political Analysis

Module 1. Political Science : Nature and Development
- Evolution of Political Science as a Discipline – Ancient, Modern and Contemporary Developments
- Classical and Normative Approaches
- Positivism [Behavioralism and Post-behavioralism]
- Liberal and Neo-liberal - Marxist and Post/Neo-marxian approaches

Module 2. Substance of Political Science
- State, Power, Authority, Legitimacy, Civil Society, Identity Politics [Caste, Gender and Religion]

Module 3. Positivist Theories
- System Analysis [David Easton]-Structural Functional Analysis [Gabriel Almond]-Communication Theory [Karl Deutsch]

Module 4. Theories of Democracy
- Elite Theory [Pareto, Mosca, Michels and Sartori]-Pluralism [Dahl]-
- Participatory and Deliberative Democracy – Public Sphere [Habermas]

Module 5. Political Culture and Political Socialization
Module 6. Political Development, Modernization and Political Decay

Unit II
Political Thought

Module 1. Ancient Greek Political Thought
• Plato and Aristotle

Module 2. Political Liberalism

Module 3. Contemporary Liberalism
• John Rawls and Robert Nozick

Module 4. Marxian Tradition
• Karl Marx, V.I. Lenin, Mao Tse – tung and Antonio Gramsci

Module 5. Contemporary Marxism
• Louis Althusser and Nicos Paulantzas

Module 6. Critical Theory
• Theodore Adorno and Jürgen Habermas

Module 7. Indian Political Thought
• Kautilya, M.K. Gandhi, M.N. Roy, Ram Manohar Lohia and B.R. Ambedkar

Unit III
Indian Government and Politics

Module 1. Historical Antecedents and Ideological Base of Indian Constitution

Module 2. State and Individual

Module 3. Structure and Power
• Union Executive and Legislature: President-Prime Minister-Council of Ministers-Parliament
• State Executive and Legislature: Governor-Chief Minister – Council of Ministers-Legislature.

Module 4. Federalism and Issues in Centre-State Relations
• Nature and Constitutional Provisions of Indian Federalism-Centre State Relations
• Contentious Areas -Demand for State Autonomy-Emerging Trends-Need for Restructuring Centre – State Relations

Module 5. Secularism : Theory and Practice
• Secularism: Nature- Constitutional Provisions-Challenges
• Communalism and Communal Politics

Module 6. Party System and Electoral Politics

Module 7. Judiciary

Module 8. Caste, Class, Gender and the Quest for Social Justice
• Caste and Identity Politics-Class and Politics: Changing Nature
• Marginalized Social Groups: Women-Children-Minorities-Scheduled Castes and Scheduled Tribes

Module 9. State and Political Economy of Development
• State and Development –Nehruvian Model of Development-Planning-Agrarian Issues-Economic Liberalization and Emerging Paradigm of Development-Changing Nature of Indian State
Module 10. Grass root Democracy
- Evolution and Growth-73rd and 74th Constitutional Amendments -Structure, Powers and Functions -Role of PRIs in Democratization and Rural Development

Unit IV
Comparative Politics

Module 1. Comparative Politics: Nature and Theories
- Meaning, Nature and Evolution
- System Theories, Cultural Theories, Modernisation Theory, Dependency Theories and Class Theories

Module 2. Constitutionalism and Forms of Political Systems
- U.K, U.S.A, France, China, Canada and India
- Comparative Federalism (U.S.A, Canada and India)

Module 3. Political Structures and Governance (U.K, U.S.A, France, China, and India)
- Legislature-Judiciary- Executive-Bureaucracy - Separation of Powers - Checks and Balances

Module 4. State and Individual
- Rights and Liberties - Comparative Analysis (U.S.A, China and India)
- Multiculturalism (U.S.A, India and France)

Module 5. Party System and Electoral Process
- Political Participation, Parties and Party Systems- Interest Groups

Module 6. Problems of Nation Building in Developing Countries
- Socio Economic Issues in Nation Building (India, Brazil and Nigeria)

Unit V
International Relations

Module 1. Theories and Approaches to the Study of International Relations

Module 2. Changing Nature of Nation State

Module 3. Power: National Interest, Ideology, and Foreign Policy
- Elements and Determinants of Power-Acquisition, use and Limitations of Power- Formulation and Promotion of National Interest- Meaning and Relevance of Ideology in International Relations- Determinants of Foreign Policy

Module 4. War and Conflict
- Types and Significance of War- Arms race- Arms control and Disarmament- NPT, CTBT, FMCT

Module 5. Approaches to Peace

Module 6. International and Regional Institutions
- UN- Origin, Growth, Provisions and Practices – Power Struggle within the UN- Reform of the UN- Regional Organizations: SAARC- ASEAN- BRICS

Module 7. International Political Economy
- North-South and South-South Cooperation, IMF, WTO and Asian Infrastructure Investment Bank (AIIB)

Module 8. Contemporary Issues in International Relations
• Terrorism- Religious – Fundamentalism- Environment and Climate Change- Human Rights- Problems of Democratic Transition (Arab Spring) - Maritime Security and Cyber Security

Module 9. Emerging World Order
• Post-cold War Developments and the Changing role of USA and China

Module 10. India in International Relations
• India as a Rising Power- Basic Features, Strategies and New orientations of Foreign Policy- Relationship with Neighbors and Big powers- USA, China and Russia.

Unit VI
Public Administration

Module 1. Introduction to Public Administration

Module 2. Theories of Administration
• Scientific Management - Classical - Bureaucratic - Human Relations - Decision Making

Module 3. Approaches to Public Administration
• Structural- Functional - Behavioural - Systems - Public Choice - Ecological

Module 4. Contemporary Discourse in Public Administration
• Entrepreneurial Government- Theories of Governance - Concept of People’s Participation in Administration-Development Policy and Administration

Module 5. Personnel Administration
• Recruitment- Training- Promotion- Discipline- Morale-
• Employer- Employee Relationship
• UPSC-Structures, Powers and Functions

Module 6. Principles of Organization
• Line and Staff- Unity of Command- Hierarchy - Span of Control-Centralization and Decentralization-Types of Organization- Formal and Informal Forms of Organization-Department-Public Corporation and Board

Module 7. Bureaucracy
• Theories, Types and Role- Max Weber and his Critics- Civil Servant-Minister relationship

Module 8. Financial administration
• Principles of Budget- Types of Budget- Budgetary Process- Audit- Control over Finance with Special Reference to India.

Module 9. Good governance
• Transparency and Accountability- Right to Information, ICT and Good Governance - Grievances and Redressal institutions: Ombudsman- Lokpal and lokayukta

26. Psychology

Unit I
Cognitive Processes

Module 1. Attention
• Consciousness and attention: Preconscious processing; Controlled and Automatic processes
• Functions of attention: Signal detection, Vigilance, Selective attention, Divided attention, Sustained attention and Alternating attention
• Models of attention: Selection models of attention (Early filtertheory, Attenuated filtertheory, Late filter theory, Multimode theory); Capacity model (Attention resources theory, Multiple resource model).
• Physiological basis of attention

Module 2. Perception
• Nature of perception: Perceptual organization and constancies; Depth perception; Viewer, Person and Landmark centered approaches to form perception
Module 3. Memory and Forgetting
- Models of memory: Atkinson-Shiffman model, Levels of processing model, Nature of memory model, Working Memory model, PDP or Connectionist model
- Why we forget: Consolidation theory, Interference theory, Decay theory, Cue dependent forgetting, Displacement theory, Repression, Amnesia.
- Testing memory: Components of memory tests; WMS and PGI memory test
- Physiological basis of memory

Module 4. Intelligence and Creativity
- Traditional theories: Two factor theory (Spearman and Cattell); Multifactor theory; Hierarchical model; Primary mental abilities or Group factor theory; Structure of intellect model
- Contemporary theories: Triarchic theory; Multiple intelligence theory; Emotional intelligence theory; PASS model
- Nature of creativity; Divergent and Convergent thinking; Little c and Big C; Stages of creative thinking; Types of Creative contributions

Module 5. Thinking
- Problem solving: Types of problem; Approaches to problem solving; Types of heuristics, Reproductive and productive problem solving; Obstacles to problem solving
- Decision making: Classical or rational man theory; Subjective expected utility theory; Bounded rationality; Elimination by aspects; Biases and heuristics
- Reasoning: Deductive reasoning (Conditional - Types or Propositional calculus and Errors), Syllogistic - Linear, Conditional and Errors); Inductive reasoning

Unit II
Motivation, Emotion and Learning

Module 1. Biological aspects of motivation
- Instinct theory and Ethology; Homeostasis and arousal theory; Biological needs and drive reduction

Module 2. Psychological aspects of motivation
- Locus of control and motivation; John Hollands theory of motivation; Psychoanalytic theory and unconscious motivation; Activation theory, Theories of Erikson, Murray, and Maslow, Motivation in behaviouristic theory

Module 3. Social aspects of motivation
- Intrinsic and extrinsic motivation; Level of aspiration; Social needs; Knowledge of result; Prestige suggestion; Humanistic model; Frustration aggression model

Module 4. Motivation and emotion
- Types of emotion, Theories of emotion (James-Lange theory, Cannon-Bard theory, Schachter-Singer theory, Cognitive mediational theory, Facial feedback theory); Stress and coping. The concept of cortical arousal and ARAS; Biological basis of motivation and emotion

Module 5. Motivation and learning
- Motivation in learning: Self efficacy; Zone of proximal development; Discovery learning; Gange’s theory
- Learning by association: Classical conditioning; One shot learning; Conditioned emotional reaction
- Learning as effect of behaviour: Operant conditioning; Connectionism; Systematic behaviour theory or mathematical model
- Cognitive theories of learning: Latent learning; Insight learning; Expectancy theory
- Verbal learning
- Neurological basis of learning and memory
Unit III
Psychometry and Research Methodology

Module 1. Psychological Measurement

- Qualitative Vs. quantitative approach in the study of behavior
- Scales of measurement: Nominal, Ordinal, Interval, and Ratio Scales
- Classification of Psychological tests: Individual and group tests, Speed and Power tests, Verbal and Non-verbal tests, Paper and pencil tests and Performance tests, Culture free and culture fair
- Psychometric assessment
  - Intelligence tests: The Stanford-Binet Tests, The Wechsler Scales
  - Aptitude tests: Tests of special abilities, Differential aptitude tests
  - Achievement test: General achievement batteries, Special achievement test
  - Tests of Creativity: Guilford, Torrance
  - Personality test: Interviews, observation, Situational tests, Self-reports, inventories, questionnaires, rating scales, forced choice methods, check-lists, Q-sorts, Semantic differential, sociometry, content analysis, projective techniques

Module 2. Test Construction

- Test conceptualization: Item preparation, Item analysis, Estimation of reliability, validity, and norms, Preparation of test manual
- Reliability: Concept, reliability estimate, types: test-re-test, parallel forms, split-half, other methods of estimating internal consistency, inter-scorer reliability, purpose of reliability co-efficient
- Validity: Concept, types: face, content, criterion, construct, convergent, divergent, relationship between validity to reliability
- Norms: Meaning of norm-referencing and criterion referencing, Steps in developing norms
- Types: age-equivalent norms, grade-equivalent norms, percentile norms, standard score norms

Module 3. Quantitative research methods

- Nature of quantitative data
- The concept of variance: Partitioning of variance, controlling error variance through research designs
- Different kinds of quantitative research methods: Experimental research methods: Characteristic features of experimental research methods, Between group designs: Two group designs, ANOVAR designs, Factorial designs, Within group designs
- Quasi-Experimental research methods, Time series, equivalent time-samples, on-equivalent control group designs, counterbalanced design, separate-sample pretest-posttest design, patched-up design, longitudinal design, cross-sectional design, cohort design
- Ex-post-facto research: Correlational design, criterion-group design - Non-experimental designs: Observational research, Archival research, Case study research
- Small N designs: Advantages and disadvantages of small N designs, Different kinds of small N designs

Module 4. Qualitative Research Methods

- Nature of qualitative data
- Different kinds of qualitative research: Action research, Case study research, Ethnography, Grounded theory, Phenomenology, Historical research
- Techniques to collect qualitative data: Interview, Narrative and metaphor, Observation, Focus group discussion
- Techniques to analyze qualitative data: Hermeneutics, Semiotics

Module 5. Sampling and Data Processing

- Different sampling techniques: Probability sampling methods, Non-probability sampling methods
- Data processing: Tabulation and coding, Statistical analysis of the data, Estimating differences among the groups: t-tests, Anova, Manova, Discriminant analysis, non-

**Unit IV**
**Personality and Social Psychology**

**Module 1. Describing Personality**
- Philosophical perspectives, personality research: True experiments, Quasi experiments, Correlational studies, Case and epidemiological studies, Personality assessment: objective methods, projective methods, behavioural assessment methods.

**Module 2. Perspectives of personality**
- Biological and evolutionary perspective: Social Darwinism and Eugenics. The genetic dimension of evolution, Contributions of Darwin, Lamarck, Mendel, Evolutionary Psychology: Natural selection of psychological mechanisms, Genes and behavior, Eysenck’s Model of nervous system temperament
- Behavioural Perspective: Dollard & Miller, B.F. Skinner
- Trait Perspective: G.W. Allport, R. B. Cattell
- Cognitive and social cognitive perspective: Lewin’s Field theory, Kelley’s Personal Construct Theory, Rotter’s locus of control approach, Bandura’s Social Cognitive learning theory
- Humanistic Existential Perspective: Carl Rogers Rollo May, Victor Frankl, Abraham Maslow
- Eastern Perspective: Yoga, The Bhagavad Gita, Sufism, Buddhism Jainism, Taoism

**Module 3. Social perception**
- Perceiving persons: Impression formation and impression management, Attribution: attribution theories, attribution biases, culture and attribution, motivational biases, Information integration
- Confirmation biases: Perseverance of beliefs, confirmatory hypothesis testing, the self-fulfilling prophecy
- Stereotypes, prejudice, and discrimination: Nature and origin-social categories and intergroup conflict, social identity theory, culture and social identity, culture and socialization, how stereotypes distort perceptions and resist change, automatic stereotype activation, prejudice: origin, sources, targets and consequences, Reducing stereotypes, prejudice, and discrimination, intergroup contact, intergroup friendships and extended contact

**Module 4. Social Influence**
- Attitudes: Measurement, formation, attitudes and behavior, persuasion by communication, persuasion by our own actions, role playing, cognitive dissonance theory, changing attitudes
- Conformity: Classical studies, compliance, obedience: Milgram’s research, social impact theory
- Groups: Fundamentals of groups, individuals in groups, social facilitation, social loafing, group performance, brain storming, group polarization, group think, escalation effects
- Conflict: Mixed motives and social dilemmas, conflict escalation and reduction, negotiation.

**Module 5. Social relations**
- Need to belong, the initial attraction, close relationships, interdependent relationships, romantic relationships
- Pro-social behaviour, evolutionary and motivational factors, situational influence,
bystander effect, time pressure, location and helping, culture, moods, pro-social media effects, role models and social norms

- Altruistic personality, interpersonal influences: perceived characteristic of the person in need, gender and helping
- Aggression-culture, gender and individual difference, causes of human aggression, the frustration-aggression hypothesis, negative affect, prevention and control of aggression

**Unit V**

**Psychopathology**

**Module 1. Diagnosis and classification of Mental disorders:**
- DSM & ICD classifications.
- case taking practices- MSE, MMSE, clinical interview, case study, common signs and symptoms of mental disorders.

**Module 2. Neurodevelopmental disorders:**
- Intellectual disabilities, pervasive and specific developmental disorders, communication disorders, autism spectrum disorders, specific learning disorders, behavioural and emotional disorders with onset in childhood and adolescence.

**Module 3. Major Mental Disorders**
- Schizophrenia spectrum and other psychotic disorders- schizophrenia, schizo-typal, delusional, and other non-psychotic disorders, affective disorders- bipolar - depressive disorders

**Module 4.**
- Personality disorders, sexual dysfunctions, gender dysphoria, mental and behavioural disorders due to psycho active substance use

**Module 5.**
- Anxiety disorders, dissociative disorders, trauma - stress related, somatoform disorders, obsessive – compulsive related disorders.

**Module 6.**
- Neurocognitive disorders-organic mental disorders, vascular dementia, amnestic disorder, delirium, personality and behavioural disorders due to known physiological conditions, unspecified organic mental disorders.

**Unit VI**

**Applied Psychology**

**Module 1. Psychology in Organizational Setting**
- Approaches to organizational behaviour - Training for Organizational Managers - Sensitivity training, Cultural diversity training, protection against sexual harassment training, 360 degree feedback, Mentoring, Organizational Counseling - Chronic absentees, accident prone employee, alcoholism and drug addition, indisciplined employees.

**Module 2. Psychology in School Setting**

**Module 3. Psychology in clinical setting**
- Psychodynamic Psychotherapies - Supportive Psychotherapies, Crisis intervention, Hypnosis, Group Therapies
- Behaviour Therapies - Relaxation and Systematic Desensitization - Progressive muscular relaxation, Guided - Somato - Psychic relaxation, Assertive training, Modeling, Contingency Management, Response elimination and Extinction procedure, punishment and aversion procedures, applied behavior analysis.
- CBT, Beck cognitive Therapy, RET, Biofeedback, Stress inoculation

**Module 4. Psychology of health and well-being**
- Bio-psychosocial approaches - Promotion of psychological, social and physical well being,
health related beliefs and attitudes, health enhancing behavior, health compromising behaviour, Type A and Type B personalities, Psycho-neuro-immunology, Pain & its management

Module 5. Emerging trends in Psychology
- Sports -Personality profile of athletes - Team cohesion – Combating drug abuse in Sports Persons
- Forensic – Biological evidence: DNA finger printing, Brain mapping; Detection of deception; Interrogation, Polygraph, Narcoanalysis
- Environmental Psychology – Psychological roots of Environmental Psychology – Climate and well being – Pollution and its effect on human being – Disaster management

27. Russian

Unit I
Russian Grammar
Module 1.
- The Noun – Gender, number, declensions
Module 2.
- The Pronouns
Module 3.
- The Adjectives
Module 4.
- Use of Cases with and without prepositions
Module 5.
- The Verb – aspects of verbs, verbs of motion and actions with and without prefixes
Module 6.
- The Participles, The verbal adverbs
Module 7.
- Active and passive voice
Module 8.
- Compound and complex sentences
Module 9.
- Direct and Indirect Speech

Unit II
Modern Russian Language: Phonetics and Lexicology
Module 1.
- Sound system of Russian, Classification of Russian Sounds, Change of Sounds
Module 2.
- Stress and types of intonations
Module 3.
- Russian Vowels, Classification of Vowels, Reduction of Vowels
Module 4.
- The Russian Consonants: Classification, Palatalized and Non-Palatalized consonants, Voiced & Voiceless Consonants, Assimilation rules, voicing and devoicing of consonants, regressive palatalization
Module 5.
- Russian vocabulary and phraseology
Module 6.
- Synonym, Polysemy, Homonymy,

Unit III
Morphology and Syntax
Module 1.
- Parts of speech in Russian
Module 2.
- Syntax as a subject of study, Syntax of the word combination
Module 3. Types of sentences
- Simple sentence: Affirmative, Declarative, Exclamatory sentences
- Compound Sentences and Complex Sentences
- Direct and Indirect Sentences

Unit IV
Russian Cultural History
Module 1.
- Geographical features of Russia
Module 2.
- The Slav people, Kievan Rus
Module 3.
• Mongol Tatar Invasion

Module 4.
• Rise of Moscow, Ivan-IV

Module 5.
• Peter’s Reforms

Module 6.
• Peasant revolt

Module 7.
• Catherine-II

Module 8.
• Patriotic War of 1812, The Decembrists

Module 9.
• Emancipation of Serfs, Norodniki and other groups and their role

Module 10.
• Lenin and October Revolution, Civil War

Module 11.
• Building of Socialism and five Year Plans, NEP

Module 12.
• Disintegration of USSR

Module 13.
• Contemporary Russian society and culture

Unit V
Russian Literature: Prose Fiction

Module 1.
• General study of Russian Literary Movements and Criticism: Classicism, Sentimentalism, Romanticism, Realism, Modernism, Socialist Realism, Magic Realism et al.

Module 2.
• Lomonosov and Classicism

Module 3.
• Radischev – A journey From Petersburg to Moscow

Module 4.
• Pushkin – The Tales of Ivan Belkin, The Caption’s Daughter

Module 5.
• Lermontov – The Hero of Our Time

Module 6.
• Gogol – Dead Souls

Module 7.
• Turgenev – Fathers and Sons

Module 8.
• Dostoyevsky – Crime and Punishment, The Karamazov Brothers

Module 9.
• Tolstoy – Anna Karenina, Resurrection, War and Peace

Module 10.
• Chekhov – Death of a Clerk, Man in a Case, Ward No.6

Module 11.
• Gorky – Mother, Makar Chudra

Module 12.
• Nikolai Ostrovsky – How the Steel was Tempered

Module 13.
• Sholokhov – And Quite Flows the Don

Module 14.
• Pasternak – Doctor Zhivago

Module 15.
• Solzhenitsyn – One Day in the Life of Ivan Denisovich

Module 16.
• Bulgakov – Master and Margarita

Module 17.
• Rybakov – Children of Arbat

Module 18.
• General study of contemporary Russian authors: Tat’yana Tolstaya, Valimir Sorokin, Evgeny Popov

Unit VI
Russian Literature:
Poetry and Drama

Module 1. Russian Poetry
• Zhukovsky and Romanticism
• Pushkin – Evgenii Onegin
• Lermontov – Death of the Poet, The Sail
• Nekrasov – Komu na Rusi Zhit’ Khorosho
• Blok – The Twelve
• Akhmatova – Requiem
• Esenin – Rus Ukhodyashaya, Shagane ty moya Shagane
• Mayakovsky – Poem about Soviet Passport, Vladimir Illich Lenin, Khorosho

Module 2. Russian Drama
• Pushkin – Boris Godunov
• Aleksandr Ostrovsky – The Storm
• Gogol – The Government Inspector
• Chekhov – The Cherry Orchard
• Gorky – Na Dne (Lower Depth)
• Bulgakov – The Days of Turbins

• Phonetic changes and their causes
• Semantic changes - types and causes

Unit II
Sāhitya

Module 1. Poetry
• Rāghuvamśa Canto II
• Naiśadhiyacarita, Canto III
• Dhvanyāloka, Ananas I & II
• Vakroktijīvita- Six Vakratās only (I&II)
• Kavyaprakāśa Ullāsas I to IV

Module 2. Drama
• Āścaryacūḍāmanī
• Abhijnānaśākuntala
• Śvapnavāsavadatta

Unit III
Jyotiṣa

Module 1.
• Bṛhajjātaka of Varahamihira, chapters I & II (horā)

Module 2. Muhūrttapiadavi of Mattur
Nampoothiri
• Vivāha, Annapraśa, Vidyārmbha, Grhrāmbha śaḍchloṣa

Module 3. Gaṇakataraṇīgı of Sudhakara
Dvivedi
• Āranyaka, Varahamihira, Kamalākara, Kalyāṇavarmā,
• Keśava, Gaṇeṣa, Brahmagupta, Bhāskara, Śripati, Lalla

Unit IV
Vyākaraṇa

Module 1. Laghu siddhāntakaumudi
• Aśandhi, Halsandhi, Visargasadhi - Samāsa - Avyayayibhava, Tatpurusa, Bahuvrihi, Dvandva - Padavyavastha - Atmanepada, Parasmaipada, - Siddhārūpa - Declension of the following in Vidvas, idam (in all three genders), asmad, magahavat, dīś

28. Sanskrit

Unit I
General

Module 1. History of Sanskrit Literature
• Vedic Literature
• Classical Literature
• Kerala Sanskrit Literature
• Technical Literature

Module 2. Vṛttā and Alaṅkāra
• Definitions, and Illustrations of the following twelve Vṛttas - 1) Aṛyā, Giti, Indravāja, Śāliṇī, Vaṁśasthā, 2) Bhūjaṅgaprayāta, Mālinī, Vasantiṅlaka, Śikharīṇī, 3) Mandākāntā, Śārdūlāviktīṭā, Śrayāṅgārā
division, Definitions, and Illustrations of the following twelve Alaṅkāras – 1) Uppama, Rūpaka, Ulekhā, Utprekṣā, Atiśayokti, 2) Dīpaka, Vayatreka, Samāsokti, Aprastutapraśaṁśa, 3) Śleṣa, Kavyālīṅga, Arthāntaraṇāsā

Module 3. Linguistics
• Classification of languages
• Indo-European Family of Languages – General Characteristics, Major members, divisions
• Indo -Iranian branch - Vedic Sanskrit & Avesta; Classical Sanskrit, Prāktṣ
• Primitive/ Proto-IE languages, Phonetic laws: Grimm’s, Grassmann’s, Verner’s;
Module 2. Social Legislations
- Indian Constitution: history, fundamental rights, duties and directive principles of state policy, constitutional remedies
- Human Rights, UDHR, NHRC and Right to Information Act

Unit II

Module 1. Sociology
- Concept and types - society, community, association, and social institutions
- Concept: social structure, social system social processes - conjunctive (cooperation, assimilation, accommodation, acculturation) - disjunctive (competition, conflict) - social disorganization
- Socialization-meaning, stages, process, agents and theories
- Social stratification
- Social control and social change - concept, agencies
- Social Movements - Bhoodaan, Chipko, Apiko, Narmada Bachao Andolan, Muthanga, Plachimada, Koodumkulum,

Module 2. Economics
- Economics basic concepts - demand-supply, production-consumption, productivity & utility, production - factors and means
- Economic systems (types)
- Development: concept and indicators - HDI, GDP, GNP, PI, PQLI
- Economic Planning: Five Year Plans - Decentralisation - Panchayati Raj institutions (PRI)

29. Social Work

Unit I

Module 1. History and Philosophy of Social Work
- Social work: Definition, meaning, objectives, principles, skills and techniques.
- Social work related concepts: Social service, social welfare, social security, social reform, social policy, social defense, social development, social justice, and social health.
- Evolution of social work profession
- Primary and secondary methods of social work
- Fields (settings) of social work: Clinical, school, correction, community development, child rights
- Approaches to social work practice: Charity, Welfare, Development, Participatory, Sustainability, Right-based, etc.
- NASW and Code Ethics.
Unit – III

Module 1. Developmental Psychology
- Concepts: sensation, perception, cognition, memory, intelligence
- Growth and development - influence of heredity and environment - developmental tasks - defense mechanisms
- Theories of development – Psychoanalytic, Psychosocial, Cognitive and Morality
- Development and hazards - prenatal and childhood
- Development and hazards - adolescence and young adulthood
- Development and hazards - middle adulthood and old age

Module 2. Counselling
- Counseling: definition, objectives, principles - types of counseling - qualities of a good counselor
- Counseling: process, skills and techniques, relationship (transference)
- Therapeutic approaches to counseling: psychoanalytical, humanistic, Transnational Analysis, Gestalt, existential and behavioural
- Allied fields of counselling - Life Skills Education, Family Life Education, Sex Education, Genetic Counselling, HIV, Trauma/Crisis Counselling, Geriatric Counselling.

Unit - IV

Module 1. Social Case Work
- Social case work - definition, history, concept, objectives and principles
- Social case work process - exploration, multi-dimensional assessment, social diagnosis, treatment (negotiating goals and formulating a contract, implementation and goal attainment), prognosis, evaluation, termination, follow-up
- Approaches in case work - psychoanalytical, psycho-social, problem-solving, behaviour modifications, crisis intervention, eclectic approach
- Techniques and skills in social case work - interviews, home visits, resource mobilization, referral, environmental modification, case work relationship and communication.
- Types of recordings in case work

Module 2. Social Group Work
- Concept of Group Work - definition, history, principles, skills and goals of social group work.
- Groups: types of social groups, stages of group development and group processes
- Group dynamics - Group Work process - competition, conflict, cooperation, cohesion, coercion and accommodation.
- Approaches and models in group work practice - therapeutic/social treatment, development group and task-oriented group.
- Types of recordings in social group work

Unit - V

Module 1. Community Organization
- Community Organization: concept, principles, objectives, phases, steps - differentiating community development and community organization - skills and roles of a community organizer
- Power structure and Leadership: types, participatory process and empowerment
- Models (Jack Rothman) in community organization
- Social action - concept, principles and strategies - approaches to social action - Freire, Gandhi and Alinsky.

Module 2. Administration of Human Service Organizations
- Types of Organisation
- Approaches to understanding organizations: Bureaucracy (Max Weber), Administrative Theory (Henry Fayol), Scientific Management (Frederick Taylor), Human Relations Approach (Elton Mayo) and System Approach (Chester Bernard), Theory X and Theory Y
- Registration of Societies and Trusts - Distinctive nature Non-profit (HSO)
administration and its challenges in organizational development - FCRA
• Management: concept, approaches and principles
• Administrative Processes: Planning, Organizing, Staffing (Human Resources Planning, Recruitment, Selection and Induction), Directing, Controlling, Reporting and Budgeting - Evaluation
• Job Description, Job Analysis and Job Evaluation, Performance Appraisal system.

Unit - VI
Module 1. Social Work Research and Statistics
• Social Work Research - types of research
• Research process
• Research designs - Cross-sectional, Experimental, Longitudinal, Case Study and Comparative
• Sampling designs
• Pretest and Pilot Study
• Data collection: methods and tools
• Data analysis and data presentation
• Hypothesis: concept, formulation, and testing
• Statistics: definition, functions, uses and limitations - statistical tests - Measures of central tendency and dispersion, Correlation and regression
• Report Writing: APA Formatting, bibliography

Module 2. Project Planning
• Basic concept- plan, programme, project, activity
• Project administration: financial management, personnel management

30. Sociology

Unit I
Sociology: Discipline, Concepts and Processes
Module 1: Sociology as a discipline
• Social and intellectual forces, Philosophical foundations - rationalism & empiricism; Reflexive Sociology, Public Sociology, Development of Sociology in India

Module 2. Concepts in Sociology
• Society, Community, Association, Status, Role, Culture, Norms and Values, Socialization, Groups, Social Control, Social Change, Social stratification - Caste, Class, Power

Module 3. Socio-cultural processes
• Accommodation, Assimilation, Cooperation, Competition, Conflict, Contravention, Evolution, Diffusion, Acculturation, Ethnocentrism

Module 4: Social institutions
• Family, Marriage, Kinship, Religion, Education, Polity, Economy

Unit II
Sociological Theories
Module 1. Classical
• August Comte, Herbert Spencer, Karl Marx, Max Weber, Emile Durkheim, Vilfredo Pareto

Module 2. Advanced
• Functionalism – Postulates, Talcott Parsons, Radcliff-Brown, Bronislaw Malinowski,
• Robert K. Merton
• Conflict Theory – Lewis Coser, Ralf Dahrendorf
Module 3. Recent Trends
- Critical theory - Jurgen Habermas, Louis Althusar, Antonio Gramsci
- Postmodernism and Post structuralism: Foucault – discourse analysis, knowledge and power; Jacques Derrida: deconstruction

Module 4: Integrative efforts
- Anthony Giddens – agency–structure, structuration; George Ritzer – micro-macro, integrative paradigm; Pierre Bourdieu – habitus-field, capital, civil society

Unit III
Social Research Methods and Statistics
Module 1. Social Research
- Epistemological basis – positivism, interpretivism, critical; Quantitative and Qualitative, Types – basic, applied, action; Objectivity, Validity, Reliability, Ethics and Value basis in social research

Module 2. Research Process
- Problem formulation, Literature review, Research Design – longitudinal and cross-sectional; Concepts, Hypothesis, Variables, Universe, Unit, Pilot study, Sampling – probability and non-probability

Module 3. Methods, Tools and Techniques
- Quantitative – social survey, interview schedule, questionnaire; Attitude scale – Likert, Thurston
- Qualitative: observation – participant & non-participant; ethnography, case study, oral history, narratives, triangulation

Module 4. Social statistics
- Measures of central tendency and dispersion, Levels of measurement – nominal, ordinal, interval, ratio; test of significance – chi-square, t-test, measures of correlation - Karl Pearson’s, Spearman’s Rank

Unit IV
Sociology of India
Module 1. India as a plural society
- Diversities in India – ethnic, caste, demographic, regional, religious, linguistic

Module 2. Approaches to the study of Indian Society
- Indology – G.S. Ghurye, Louis Dumont
- Structural-functional – M.N. Srinivas, S.C. Dube
- Marxian – A.R. Desai, D.P. Mukherji
- Subaltern – B.R. Ambedhkhar, Kancha Illaiah

Module 3. Socio-economic challenges and welfare measures
- Poverty, Inequality, Marginalized groups – Scheduled castes, Tribes, OBCs, Minorities;
- Women and Child – atrocities against women, health
- Child rights, Issues of Elderly and Differently-abled
- Constitutional and legislative measures for marginalized groups
- Social movements in India: Agrarian, Backward class, Women

Module 4. Contemporary issues
- Problems of nation-building – secularism, communalism, sub-nationalism, terrorism, ethnic conflict, caste and religious conflict, regionalism, corruption
Module 2. Theories in development
- Modernization – W.W. Rostow
- Dependency theory – Samir Amin
- World System – Immanuel Wallerstein
- Alternative development – M.K. Gandhi, E.F. Schumacher

Module 3. Rural and Urban development
- Rural social structure, Agrarian relations, Green revolution, Urbanism, Urbanization, Suburb, Metropolis, Cities, Towns, Slums, Rural and Urban development programmes in India, Population dynamics and Challenges – fertility, morality, migration, demographic transition

Module 4. Development Experience in Kerala
- Land reforms, Socio-political movements in Kerala, Land struggles, Kerala development model – education, health, social security
- Decentralization process – 73rd & 74th amendment, peoples planning and emergence of local governance in Kerala
- Migration and Kerala diaspora

Unit VI
Globalization and Emerging Challenges

Module 1. Understanding Globalization
- History and characteristics, Agencies of globalization, Global village, Consumerism McDonaldization, Effects of globalization on marginalized communities, Development induced displacement, New Social Movements in the context of globalization

Module 2. Media and Communication
- Mass media in a globalized world, Corporate media, Globalization of news, Cultural imperialism through media
- Information, Communication and Technologies (ICTs) – digital media, digital divide, social media, cyber media, net neutrality, social networks and virtual communities

Module 3. Changes in Industry and Industrial management
- Industry in a globalized world, MNCs and outsourcing and its impact, New management principles, Corporate Social responsibility (CSR), Industrial pollution, e-waste and waste management

Module 4. Impact on environment
- Environmental degradation, Climate change and its impact, Global warming, Ozone depletion, Global movements and discourses, Initiatives of state and International agencies – Stockholm, Rio and Kyoto Summits

31. Statistics

Unit I
Mathematical Methods for Statistics

Module 1.
- Sets, set of real numbers, functions, sequences and series of real numbers, their limits and convergences. Continuous functions, discontinuities of functions, bounded functions, conditions for differentiability of functions, Riemann integrals and properties.

Module 2.
- Cartesian product of sets, metric space, open and closed sets, limit points, closure of a set, complete metric space, Heine-Borel theorem.

Module 3.
- Linear space, subspaces, linear dependence and independence of vectors, basis and dimension, linear transformation in vector space, normed linear space.

Module 4.
- Matrices, different types of matrices, algebra of matrices, adjoint of a matrix, inverse of non-singular matrices, g-inverse, rank and determinant of matrices, solving linear
equations by matrix method, eigen values and eigen vectors, Cayley-Hamilton theorem. Quadratic forms and their definiteness.

Module 5.
- Classes of sets, limit superior, limit inferior and convergence of sequence of sets, ring, monotone class, field and sigma field of sets, general definition of measure, Lebesgue and Lebesgue-Stieltjes measures. Measurable sets and measurable functions, definition of integral, Lebesgue and Lebesgue-Stieltjes integrals, properties, convergence theorems, applications of Radon-Nikodym theorem.

Unit II
Probability Theory

Module 1.
- Definitions of probability (classical, frequency ratio and axiomatic approaches), classes of events, probability measure and properties, independence of events, pairwise and mutual independence of events, addition theorem of probability.

Module 2.
- Conditional probability, multiplication theorem, Bayes’ theorem and applications.

Module 3.
- Random variables, cumulative distribution function and properties (both univariate and bivariate cases), decomposition of a distribution function, probability density function and probability mass function, discrete and continuous random variables, independence of random variables, connection between distribution function of a random variable and Lebesgue-Stieltjes measure.

Module 4.
- Expectation and moments of random variables, properties, moment generating function, cumulant generating function, characteristic function, probability generating function and their properties, inversion theorem on characteristic functions.

Module 5.
- Chebychev and Ljapunov inequalities, Borel-Cantelli lemma, Borel zero-one law. Convergence of sequences of random variables: weak convergence, convergence in probability, convergence in r-th mean and almost sure convergence, and their mutual implications. Laws of large numbers and central limit theorems.

Unit III
Distributions in Statistics

Module 1.
- Bernoulli, binomial, Poisson, geometric, negative-binomial, discrete uniform, hypergeometric, multinomial and power series distributions - properties and characteristics of these distributions.

Module 2.
- Rectangular, exponential, gamma, beta (type I and type II), normal, log normal, logistic, Laplace, Pareto, Weibull and Cauchy distributions - properties and characteristics of these distributions.

Module 3.
- Functions of random variables and their distributions, distributions of sum, product and ratio of independent random variables. Order statistics, basic distribution theory, joint and conditional distribution of order statistics, distribution of order statistics arising from uniform and exponential distributions - properties.

Module 4.
- Sampling distributions - standard error, distribution of mean and variance of samples from normal populations. Exact sampling distributions - chi-square, t and F (central and non-central), inter relationships between these distributions and their applications (including significance tests).
Module 5.
- Bivariate distributions: discrete, continuous and mixed forms, marginal and conditional distributions. Bivariate normal distribution and its characteristics, simple correlation and regression, their properties and tests.

Unit IV
Estimation and Testing of Hypotheses

Module 1.

Module 2.
- Methods of estimation: maximum likelihood, method of moments and least-squares method and their properties, comparison of these estimates in normal population. Minimum chi-square and modified minimum chi-square methods.

Module 3.
- Basic concepts of hypothesis testing, type I and type II errors, critical region, power of a test, Neyman-Pearson lemma, MP and UMP tests, likelihood ratio test, MLR property, asymptotic distribution of likelihood ratio, tests for mean and variance of normal populations, tests for proportions.

Module 4.
- Non parametric tests: advantages and disadvantages of non parametric tests, binomial, sign, Wilcoxon signed-rank, one and two sample Wald-Wolfowitz run, median, Kolmogorov-Smirnov (both on sample and two sample), Mann-Whitney U, Kruskal-Wallis tests and Friedman’s two way analysis of variance test. Sequential probability ratio tests: basic concepts, testing single parameter case for normal, point binomial and exponential distributions.

Module 5.
- Interval estimation: basic concepts of interval estimation, shortest length confidence interval, interval estimates of parameters based on normal distribution, connection between interval estimation and testing of hypotheses. Bayesian estimation: prior and posterior distributions, conjugate priors, loss and risk functions, Bayes estimation of the parameters under squared-error and absolute error loss functions.

Unit V
Sample Surveys and Design of Experiments

Module 1.
- Planning and execution of sample surveys, sampling and non sampling errors, simple random, stratified random, systematic and cluster sampling methods, estimation of the population characteristics by these sampling methods. Sample size determination.

Module 2.

Module 3.
- Linear models, estimability of linear parametric functions, Gauss-Markoff theorem, tests of linear hypotheses, Analysis of variance, criteria for connectedness, orthogonality and balance.

Module 4.
- Basic principles of experimentation, standard designs-CRD, RBD, LSD and GLSD, analysis and efficiency comparisons. Analysis of covariance in CRD, RBD and LSD, missing plot techniques.
Module 5.
- Factorial experiments: $2^n$ and $3^n$ experiments, partial and total confounding in the above experiments. Incomplete block designs: BIBD, analysis with and without recovery of inter-block information.

Unit VI
Multivariate Analysis,
Stochastic Processes and
Index Numbers

Module 1.
- Multivariate normal distribution, marginal and conditional distributions, characteristic functions, distribution of quadratic forms in normal variables, Partial and multiple correlation, multiple regression technique.

Module 2.
- Samples from multivariate normal distribution, maximum likelihood estimators of the parameters and their distributions. Hotelling’s $T^2$ and Mahalanobis $D^2$. Testing the mean vector of a multivariate normal distribution and the equality of means of two multivariate normal distributions.

Module 3.

Module 4.
- Continuous time Markov processes: Poisson process, pure birth process, birth and death process. Principles of queuing theory- $M/M/1$ and $M/M/s$ models.

Module 5.
- Time series analysis: components of time series, measurement of secular trend and seasonal components. Index numbers- simple and weighted index numbers, tests for an ideal index number, cost of living index.

32. Syriac

Unit I
Syriac Grammar,
History and Structure of
Syriac Language

- Syriac Scripts: Estrangela, East Syriac and Serto
- Orthography
- Vowel expression by vowel letters and other signs.
- Consonants: Rukakka, Qussaya
- Loan words in Syriac
- Syntax in comparison with Indian languages.
- Jacob of Edessa’s letter on Syriac Orthography
- Gregory Bar Hebraeus: Syriac Accents
- Grammatical Terminology in Syriac
- Syriac Calligraphy
- Phonology
- Morphology
- Syntax
- Parts of Speech
- Semantics
- Grammar and Grammatical categories

Unit II
Syriac Poetry and
Liturgical Literature

- Early Syriac poetry
- Main categories of Syriac poetry
- Hymnody: Kinds of Hymns (West Syriac): (Minre, - Madroshe, - Qole, - Onitha, - Mazmure, Zmirto, - Tesbeho, - Sebloyo, - Bothe, - Bo’oto, - Taksheto, - Quqoyo, - qonuno Yawnoyo)
- Hymnody: Kinds of Hymns (East Syriac): (Barrek(u), Basaliqye, Bauta, ba’wata, B-rasit, Gazza, Giyyora, Hepakta, Hullala, Hallelayn(i),...
Laku Mara, Le bakta, Madrasa, Marmita, Mawtha, Memra, Nemar, Nuhra, ‘Onita, Pshita, Qala, Qalyata, Qalta, Qanona, Res mawtba, Resqala, Rukkaba, Sogita, Suyyake, Shubha, Suhlapa, Suraya, Tawdi l taba, Tesbohta, Tu’yay, ‘udrana, ‘ullama, ‘unaya, Zumara)

- Metres
- Strophes
- Rhyme
- Acrostic
- Beth – Gazo / ‘Eqara
- Musical terminology in Syriac
- Hymnographers
- Anaphora literature - West Syriac & East Syriac
- Commentaries and commentators of Anaphorae
- Shehimo’ and ‘Penqito’; Hudra (Weekday Office and Festal Hymnody).
- Manuscripts of Liturgical Hymns and Choral books

Unit III
Secular, Biblical and Monastic Literature

- Secular literature: Popular and Learned
- Natural Sciences and Philosophy in Syriac
- Syriac Manuscripts of the British Museum on Medicine, Ethics, Agriculture, Chemistry, Philosophy, Logic and Rhetoric, Grammar and Lexicography, Natural History.
- Legal thought in Syriac tradition.
- Biblical Interpretation
- Syriac Bible: its use in the liturgy
- Syriac commentators of the Psalms
- Versions of the Syriac Bible: O.T.: Peshitta; Syro Hexapla
- N.T.: Diatessaron, Old Syriac, Peshitta, Philoxenian, and Harclean
- Syriac names of the books of the Bible
- Lectionaries
- Printed Editions
- Translations based on the Syriac Bible
- Malayalam translations of the Syriac Bible
- Syriac Apocrypha
- History of Asceticism in the Syrian Orient
- Protomonasticism
- Syriac monastic terminology
- Different monastic centers and monasteries
- Monastic writers and works

Unit IV
India and Syriac Literature

- Syriac Manuscripts burnt at Diamper Synod
- Collections of Syriac manuscripts.
- Main centers and persons (Malpanate)
- Syriac inscriptions
- Malayalam Carshuni
- Syriac books published in India / Press
- Syriac Words in Malayalam
- Syriac in Schools and Universities
- Syriac heritage of the different denominations of the Syriac Churches of Kerala.

Unit V
History of Syriac Churches

- Origins of Syriac Christianity
- St. Thomas Tradition in India
- The Church in the Sasanian Empire
- The theological schools, especially Nisibis
- The separation of the different Churches in the 5-7 centuries.
- The expansion of the Syriac Church: Emergence of the Syriac Eastern Rite Catholic Churches in West Asia
- The Syriac Communities under the Ottoman Empire.
- The Catholic and Protestant Missions to the Syriac Churches
- The Syriac Churches and Ecumenism
- Current problems of the Syriac Churches.
- The renaissance of the 12th / 13th centuries
Unit VI
Current affairs

- Catalogue of Syriac manuscripts.
- Catalogues of Syriac printed books and related literature
- Codicology
- Grammars: elementary and reference grammars.
- Lexica
- Series of Texts, Journals & Periodicals
- Bibliographical aids
- The delights of Manuscripts
- Why study Syriac
- Scope of Syriac literature
- Use of computer in Syriac
- Contemporary trends and trend setters
- Modern centers of Syriac study

33. Tamil
34. Urdu

UNIT I

1. اردو زبان و لیبل - آئے و ادارہ

2. سرپرستی کا سائنسی اور مہاری

3. تعلیم و تربیت -

4. ماؤدی سسکیا - بینکدار، بانکی کارکن

5. فنون و مصنوعات - ادبیات اور انٹرنیٹ

UNIT II

1. ادبیات

2. تاریخ

3. تعلیم و تربیت
35. Zoology

Unit I
Taxonomy, Animal Diversity and Applied Zoology

Module 1. Taxonomy
- Classical taxonomy; Modern trends in taxonomy (numerical, cladistics, molecular taxonomy); phylogenetic tree.
- Scientific classification of organisms (five kingdom and three-domain systems);
- Biological nomenclature; ICZN. Homonymy and Synonymy ; Law of priority.
- Concepts of species and hierarchical taxa.
- Molecular Systematics (Mitochondrial DNA and Ancestral Polymorphisms, RFLP,
  RAPD, AFLP & VNTR, Alternate Molecular Approaches, Allozyme polymorphism,
  Microsatellite Loci.) DNA barcoding and tree of life.

Module 2. Animal Diversity
- Prokaryotes and Eukaryotes.
- Levels of organization-cellular, tissue and organ. Symmetry, Coelom and Metamerism.
- Broad classification of animal kingdom: Mesozoa, Parazoa and Eumetazoa (Radiata, Bilateria); Protostomia (Acoelomata, Pseudocoelomata and Eucoelomata), Deuterostomia.
• Salient features of the phyla: Mesozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nematoda, Nematomorpha, Rotifera, Annelida, Echiurida, Mollusca, Onychophora, Arthropoda, Echinodermata, Chaetognatha, Phoronida, Hemichordata,
• Chordata: Cephalochordates and Urochordates, Pisces, Amphibians, Reptiles, Birds and Mammals-origin, adaptive radiation and distribution.

Module 3. Applied Zoology
• Insect pests: Pests of crops (coconut, paddy, rubber, sugar cane), Pests of stored food grains, Pest control - chemical, biological and Integrated Pest Management.
• Sericulture, Species of silkworms, Composition of silk, Silkworm rearing techniques.
• Apiculture, Species of honey bees, Beekeeping methods, Useful products from honey bees.
• Fisheries and aquaculture: Marine and Fresh water fishes, Fish breeding techniques, Finfish and Shell Fish culture, Different types of fish farming, Ornamental fishes and Aquarium keeping, Fishing crafts and gears.

Unit II
Evolution, Ecology, Biodiversity and Ethology

Module 1. Evolution
• Origin and evolution of life
• Evolutionary time scale
• Theories and modern concepts of organic evolution: Classical and synthetic theories of evolution.
• Mechanisms of evolution, Micro and Macro evolution, Co-evolution.
• Genetic drift; Bottle-neck effect; Punctuated equilibrium, Neutral theory, Molecular Clock.
• Species and speciation, Adaptive radiation and Animal distribution.
• Human Evolution-hominid fossils and cultural evolution.

Module 2. Ecology
• Ecosystem: Characteristics of ecosystem, Concepts of Habitat and Niche.
• Structure and Stability of ecosystem.
• Food chain and food web; Biological magnification and its effects.
• Energy flow, Productivity and Ecological pyramids.
• Biogeochemical cycles: gaseous cycles and sedimentary cycles.
• Ecological succession: Types, changes involved in succession, concept of climax.
• Population ecology: characteristics of populations and population growth curves.
• Community ecology: community structure and attributes; edge effects and ecotone.
• Animal interactions: Positive, negative and neutral interactions.
• Pollution: Water, Air, Soil, Noise, and Radioactive pollution- causes and consequences.
• Solid waste management.
• Major Environmental Issues: Green house effect, Acid rain, Ozone depletion, Global warming and Climate change; causes and consequences.
• Conventional and Non-Conventional Energy Resources.
• Environmental Impact Assessment; ecosystem monitoring and applications of remote sensing in environment management.
• Major international environmental conventions/ treatises and organisations

Module 3. Biodiversity
• Concepts and levels of biodiversity.
• Measurement of biodiversity and biodiversity hotspots.
• Values and threats to biodiversity.
• Conservation strategies (in-situ and ex-situ conservation).
• Forest conservation, Wildlife management, Sustainable Development.

Module 4. Ethology
• Motivation and Learning: Imprinting, habituation, imitation, classical conditioning,
instrumental/operant conditioning, cognitive learning, latent learning, insight learning.

- Complex Behaviour: Orientation, Navigation and Homing, Migration (Fishes and Birds), Biological rhythms-biological clock, Circadian, Circannual, Lunar, Tidal and Seasonal periodicities. Pheromones and chemical communication.

**Unit III**

**Physiology, Immunology and Developmental Biology**

**Module 1. Physiology**
- Respiration: Respiratory pigments, Transport of \(O_2\) and \(CO_2\), Bohr Effect, chloride shift. Neural and chemical respiratory disturbances.
- Body fluids and Circulation: Types of heart, heart beat, conducting system and pace makers. Common cardiovascular diseases. Composition of blood and Blood groups, Physiology of blood clotting, Control of cardiac activity. Lymph and lymphatic system.
- Muscle physiology: Types of muscles, Ultrastructure of skeletal muscle, Muscle contraction and properties of cardiac and smooth muscles. Simple muscle twitch, summation, tetanus, tonus and fatigue.
- Neurophysiology- Structure of neuron, Generation and transmission of nerve impulse, Synapses, Synaptic transmission and Neurotransmitters, Reflex action.

- Endocrine system: Endocrine glands and hormones, classification of hormones, Mode of action of hormones, Hormone disorders and Feedback control.

**Module 2. Immunology**
- Organs and tissues of immune system.
- Types of immunity: Innate, acquired, Humoral and cell-mediated immunity.
- Antigens and antibodies: Structure of antibodies, Antigen-antibody interactions.
- Complement system, General features, MHC, General organization and inheritance of MHC.
- Hypersensitivity, Immunodeficiency and Autoimmunity.

**Module 3. Developmental Biology**
- Gametes and gametogenesis, Types of eggs, Fertilization and Fertilization events.
- Cleavage, Blastulation and Gastrulation: Types of cleavage, Cleavage patterns, Types of blastula, Fate map, Cell movements and Organogenesis.
- Basic concepts of development: Potency of embryonic cells, Competence, determination and differentiation, Genomic equivalence, Cytoplasmic control of nuclear activity, Primary embryonic induction, Nieukoop centre and mesodermal polarity.
- Different types of Placenta.
- Parthenogenesis: Natural and artificial parthenogenesis, Factors inducing parthenogenesis.
- Experimental embryology: Constriction experiments, Experiments on embryonic induction and competence, Cloning
experiments in animals, Medically assisted reproductive techniques.
• Prenatal diagnosis and Teratogenesis.
• Basic biology of stem cells: Types and sources of stem cells with characteristics; Induced pluripotent stem cells and stem cell therapy.

Unit IV
Biochemistry, Biophysics and Biostatistics

Module 1. Biochemistry
• Water as a biological solvent: Biological importance, pH and Acid - base balance. Buffers and its biological significance.
• Classification and Structure of Carbohydrates.
• Metabolism of Carbohydrates: Glycolysis, Krebs cycle, electron transport chain, Pentose phosphate pathway, Gluconeogenesis, Glycogenolysis, Glycogenesis, biological significance.
• Classification, Structure and Biological Importance of Lipids.
• Metabolism of Lipids: Beta-oxidation of fatty acids, Biosynthesis of fatty acids. Biologically important Steroids, Prostaglandins.
• Proteins: Structure, classification and properties of amino acids, Proteins: Structure and Classification-Primary, Secondary and tertiary structure, Ramachandran plot.
• Metabolism of Amino acids and Proteins: Metabolism of Amino acids, Urea cycle, regulation of urea cycle, Deamination, Transamination and Decarboxylation.
• Vitamins: Classification, Function and Deficiency disorders.
• Enzymes: Classification and Nomenclature, Enzyme Kinetics, Regulation of enzyme activity, Enzyme inhibition, Zymogenes, Isozymes, Coenzymes and Ribozymes.

Module 2. Biophysics
• Diffusion, Osmosis and Viscosity
• Bioenergetics: Laws of Thermodynamics (Entropy, Enthalpy, Concept of Free energy, ATP as a free energy carrier)
• Radiation Biology: Ionizing radiation, units and measurement, exposure and radiation dosimeter, autoradiography, Liquid Scintillation counter.
• Microscopy, Light, Phase Contrast, Fluorescent Microscopes, Transmission and Scanning electron microscopes.
• Chromatography: Principles and Application, Column, Ion exchange, TLC, HPLC, Gas and Affinity chromatography.
• Electrophoresis: Paper, SDS –PAGE and Agarose Gel electrophoresis.
• Colorimeter, Spectrophotometer, Flame photometer, Atomic absorption spectrophotometer, Infra-red spectrophotometry, NMR and EMR spectroscopy
• Centrifuge: Ordinary, high speed centrifuges, Density gradient centrifugationn, Ultracentrifugation
• Radioimmunoassay: ELISA, Electrophysiological methods: ECG, EEG, MRI

Module 3: Biostatistics
• Measures of central tendency: Arithmetic mean, median and mode
• Measures of dispersion : Mean and Standard deviation, Standard error
• Testing of hypotheses: Concepts of Normal, Binomial and Poisson distribution; Student’s –t test, One-way ANOVA, Concepts and applications of correlation and regression, Chi-square test.

Unit V
Genetics, Biotechnology and Microbiology

Module 1. Genetics
• Mendelian principles: critical evaluation.
• Interaction of genes: Allelic interactions: incomplete dominance, codominance, Non-allelic interactions: complementary gene action, epistasis, duplicate gene and polygenes.
• Multiple alleles: coat colour in rabbits, Rh blood group inheritance.
• Linkage and crossing over: Linkage groups,
complete and partial linkage, Crossing over and recombination –Mechanisms of crossing over, kinds of crossing over.

- Mutation- Chromosomal aberrations and gene mutations, molecular basis, causes and significance.

- Extra chromosomal inheritance: Characteristics; maternal inheritance of cytoplasm, plastid genome, mitochondrial genome, Kappa particles in Paramecium, Maternal effects.

- Sex linked inheritance: characteristics, examples: haemophilia, colour blindness; holandric genes.

- Sex determination: Chromosomal basis and genic balance theory, Types of chromosomal mechanism, Dosage compensation, Barr bodies, Lyon hypothesis.

- Human genetics: Genetic disorders in man, Chromosomal anomalies (autosomal and sex chromosomal), Single gene disorders (autosomal and sex linked, inborn errors in metabolism).

- Human genome project.

Module 2. Biotechnology

- History and concept of biotechnology, Vectors, Plasmids, Bacteriophage, Cosmids, Shuttle vectors, Yeast vectors, Minichromosomes, Artificial chromosomes, Probes and molecular markers,

- Properties and type of Isozymes, RFLP, RAPD, AFLP, VNTR, Minisatellites, Microsatellites

- Techniques in Genetic Engineering: Selection and isolation of desired genes, Gene splicing, Introduction of rDNA into host, Selection of clone containing DNA insert, DNA Finger printing, DNA sequencing, Chromosome jumping, Genomic library, cDNA library.

- Gene cloning: Cloning techniques in animals, cloning in bacteria and eukaryotes, Amplification of DNA by PCR, gene transfer technology, and expression of induced genes, Restriction enzymes its applications and ligases.

- Applications of Biotechnology: Blotting techniques (Southern, Northern, Western), Genetic engineering and its applications. Diagnosis of diseases, Detection of genetic disorders, Gene therapy, Metabolites production, Bio controls agents, Biofuel, biogas Transgenic animals- Production and use; Ethics in biotechnology, Patenting, biological materials and IPR.

Module 3. Microbiology

- Diversity and Ultra structure of Bacteria.

- Microbial Nutrition and Growth, Use of microbes in medical, biotechnological, industrial and agricultural fields.

- Antibiotics and antimicrobial drugs.


Unit VI
Cell Biology, Molecular Biology and Bioinformatics

Module 1. Cell biology

- Cell and cell theory, Structure and function of cell membrane, Organization based on fluid mosaic model.

- Membrane transport - diffusion, active transport, ion pumps, bulk transport.

- Differentiation of cell membrane: microvilli, tight junctions, belt and spot desmosomes, gap junctions.


- Cytoskeleton: Microtubules, microfilaments and intermediate filaments; molecular motors.

- Cell Division- Mitosis, meiosis, Cell cycle and regulation of cell cycle, Cancer – Types and causes, Oncogenes and Tumour suppresser genes.

- Cell signalling, signalling molecules, second messengers, ligands and receptors.
• Chromosome-Structure, types, Euchromatin, heterochromatin, Nucelosome, condensation and coiling.

Module 2. Molecular biology
• Nucleic acids: DNA - structure and Conformations of DNA
• DNA replication in prokaryotes and eukaryotes, replication machinery, mechanisms and repair.
• RNA - Types of RNA and functions.
• Genome organisation- Exons, introns, overlapping genes and transposons.
• Genetic code- characteristic features, deciphering genetic code, reading frame and frame shift.
• Protein synthesis: Central dogma, Transcription, Transcription factors, Transcription activators and repressors, RNA polymerases, capping, elongation and termination. Post-transcriptional processing in eukaryotes. Translation: Mechanism, initiation complex, elongation and termination, Post-translational modifications of proteins.

• Regulation of gene expression in bacteria. Operon model: lac operon, constitutive mutants, Catabolite repression.
• Regulation of gene expression in eukaryotes. Transcription factors, histones, acetylation and de acetylation. Regulation at transcriptional and translational level. Antisense RNA strategies- siRNA, miRNA.

Module 3. Bioinformatics
• Nature and scope of Bioinformatics: Biological databases-DNA, RNA and Proteins- PDB, Swiss-PROT, GenBank, EMBL, NCBI and Entrez.
• Sequence alignment and use of BLAST, FASTA and CLUSTALW; Homology modeling, molecular phylogenetics and tree construction. Searching of database for sequence similarity.
• Introduction to genomics and proteomics- DNA and protein Microarrays.
• Computational tools for gene finding, protein structure prediction, RNA structure prediction; computational drug discovery.