



GOVT. COLLEGE FOR MEN (AUTONOMOUS) :: KADAPA

Re accredited by NAAC at B Grade

Curricula developed and implemented have relevance to the Local, National, Regional and Global developmental needs which are reflected in Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programmes offered by the Institution. Including Skill Development Courses & Life Skill Courses.

B.Sc. Maths, Physics and Computer Science (MPCs)

PROGRAMME OUTCOMES (POs)

- 1. Critical Thinking: Student can apply critical thinking and enhance learning in the three major subjects of their choice with scientific reasoning and analytical skills.
- 2. Problem solving: Think logically and organize task into a structured form for problem solving by applying the knowledge of basic science.
- 3. Effective communication: To develop the ability of effective communication of scientific information in written and oral format.
- 4. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.
- 5. Ethics: Apply ethical, moral and social values in personal and professional life leading to holistic development of the individual.
- 6. Environment and sustainability: Develop interdisciplinary approach to provide better solution and innovative ideas for sustainable development and conservation of natural resources.
- 7. Self-directed and lifelong learning: Recognize the need for and have the ability to engage in independent, lifelong learning and adapt to technological changes to be globally competent.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- 1. Gain knowledge and understanding of definitions, concepts, theorems in Algebra, Analysis, Differential Equations and Linear Algebra.
- 2. Use Mathematical software leading to professional development.

- 3. Acquire logical and analytical skills to apply the concepts to model and solve real life problems in related areas.
- 4. Attain sound knowledge in the areas of Mechanics, Thermal Physics, Optics, Electromagnetism, Quantum Physics, Solid state Physics for pursuing higher education and research.
- 5. Demonstrate basic knowledge of Physics in developing logical tools and models to draw valid solutions.
- 6. Analyze and solve problems using reasoning skills based on concepts of Physics.
- 7. Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
- 8. Engage in professional development in the fields of Information Technology and Computer Science.
- 9. Know about computing principles and business practices employed as software solutions in industries.

B.Sc. Maths, Electronics, Computer Science (MECs)

PROGRAM OUTCOMES (POs)

- 1. Critical Thinking: Apply critical thinking and enhance learning in the three major subjects of their choice with scientific reasoning and analytical skills.
- 2. Problem solving: Think logically and organize task into a structured form for problem solving by applying the knowledge of basic science.
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PROGRAM SPECIFIC OUTCOMES (PSOs)

- 1. Gain knowledge and understanding of definitions, concepts, theorems in Algebra, Analysis, Differential Equations and Linear Algebra.

- 2. Use Mathematical software leading to professional development.
- 3. Acquire logical and analytical skills to apply the concepts to model and solve real life problems in related areas.
- 4. Gain knowledge in basics of circuit analysis, Analog circuits, Semiconductor devices, Digital electronics and communication theory
- 5. Develop ability to design and conduct electronics experiment as well as analyze and interpret the data
- 6. Develop skills in microcontroller and VHDL programming.
- 7. Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
- 8. Engage in professional development in the fields of Information Technology and Computer Science.
- 9. Know about computing principles and business practices employed as software solutions in industries.

B.Sc. Biotechnology, Zoology, Chemistry (B.Sc. Bt.Z.C)

PROGRAMME OUTCOMES (POs)

The graduates of this degree program will:

- Be able to demonstrate their knowledge of biotechnology concepts
 - Possess technical knowledge and hands-on skills necessary for biotechnology research activity.
 - Be able to communicate effectively on the subject and work in teams
 - Be able to give shape to the innovative ideas
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- Think critically in terms of their learning and knowledge.
 - Assess and implement the practical techniques necessary to solve a particular biological problem.
 - Analyze and quantify data collected during a research project.
 - Communicate with expert and non-expert audiences through popular essays, poster displays, seminar presentations, project reports and Research publications.
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PROGRAMME SPECIFIC OUTCOMES (PSOs)

The graduates of this program will:

- Have basic knowledge of cell and its components
 - Be introduced to microbes and its applications.
 - Understand how the concepts of physics and chemistry are significant to biology
 - Learn basic molecular biology and apply it for genetic engineering of plants animals and environment
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B.Sc. Biotechnology, Botany, Chemistry (B.Sc. Bt.B.C)

PROGRAMME OUTCOMES (POs)

The graduates of this degree program will:

- Be able to demonstrate their knowledge of biotechnology concepts
- Possess technical knowledge and hands-on skills necessary for biotechnology research activity.
- Be able to communicate effectively on the subject and work in teams
- Be able to give shape to the innovative ideas
- Think critically in terms of their learning and knowledge.
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The graduates of this program will:

- Have basic knowledge of cell and its components
 - Be introduced to microbes and its applications.
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 - Learn basic molecular biology and apply it for genetic engineering of plants animals and environment
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B.Sc. (BBC) (Biotechnology, Botany, Chemistry)

PSO 1: understand the basic concepts of Biotechnology, Botany and Chemistry

PSO 2 :To utilize all the techniques of applied life science Biotechnology in the fields of Pharmaceutical, Animal tissue culture, Plant tissue culture, Immunological ,Genetic engineering and Bioinformatical laboratories .Knowledge about the productions of Biofertilizers and Waste Management techniques useful for Environmental management. Understanding about Recombinant DNA technology useful for production of transgenic plants and Animals. Trained students to various biotechnological tools empowered to do Biological Research.

PSO 3: To understand the application of biological sciences in Horticulture, Genetic engineering and Biotechnology. To analyze the taxonomic range of various life forms as per their external characters and internal chemical constitutions. To understand the principles of origin of life and its evolutionary trends, Microbial diversity, chemical theory related to origin of life. To gain knowledge upon Environmental factors effects on plant growth regulations phytogeographical

distributions of plants and conservation methods of Biodiversity.

PSO 4 : To develop interest among students in various branches of chemistry .Students able to analyze spectroscopy, Chromatography in various industries like pharmaceutical, chemical, agriculture textiles, Petroleum cosmetics, polymers and chemical technology and advance techniques in Nano chemistry

B.sc B.Z.C. (Botany, Zoology, Chemistry)

PSO 1: Understand the basic concepts of Botany, zoology and chemistry.

PSO 2: Understand the application of biological sciences in Horticulture, genetic Engineering and Biotechnology. To Analysis the Taxonomic Range of Various Life Forms As Per Their External Characters And Internal Chemical Constitutions .To Understand the Principles of Origin of Life and Its Evolutionary Trends, Microbial Diversity, Chemical Theory Related to Origin of Life. To Gain Knowledge on Environmental Factors Effects on Plant Growth Regulation and phytogeographycal Distributions of plants and conservations methods of biodiversity.

PSO3: Perform procedures as per laboratory Standards in the area of cell biology, genetics, Physiology, ecology, Embryology and Aquaculture. Understand anatomy of Invertebrates & vertebrates. Understand the Various animal species based on phylum. Acquire basic Knowledge and skills in certain applied branches to enable them for Self employment. Students gain Knowledge and skills in the fundamentals of animal science; understand the complex interactions among various Living organisms.

PSO4:To develop interest among students in various branches of Chemistry students able to analyze Spectroscopy, chromatography, in various industries like Pharmaceutical , chemical ,Agriculture textiles Petroleum cosmetics, polymers and chemical technology and advanced Techniques in nano Chemistry.

BA History, Political Science, Urdu Literature H.P.U

PROGRAMME OUTCOMES

Students pursuing U/G Programme in H.P.U (UM) will be able to gain basic knowledge in the concerned subjects namely History, Political Science, and Urdu Literature. Student shall get acquainted with various developments in the subjects concerned over the period of time.

Students will be able to understand and explain various stages in the development of concerned subjects. Student will be able to understand, analyze and apply the knowledge gained.

Student will be able to understand, appreciate and adopt the principles of Human and Moral Values as portrayed in the various chapters concerning History, Political Science and Urdu Literature.

Student will be able to further enhance communication skills in their own mother tongue. Student will be able to hone skills of Creative Writing, hence paving way for the development of creative ideas.

Students pursuing this programme will be able to appear in various competitive exams leading to recruitment for administrative posts through APPSC and UPSC etc.

B.A - Economics, History, Political Science (E.H.P)

Programme Specific Outcomes

PSO 1: Understand the basic concepts like National Income, Poverty, Employment, International trade, Fiscal and Monetary policies, Economic conditions of various historic periods, Satavahana's Foreign trade, numismatics, agriculture economy from ancient period to modern times and their role in administration for formulating relevant policies for effective utilisation of resources and tackling various problems like unemployment and improved standard of living.

PSO 2 : To analyse the economic importance of various sectors like agriculture, industry and service sector in different dynasties that influence administration like Chola administration (local self Government), Mauryan administration (Urban governance) and British administration.

PSO 3: To understand the impact of agriculture and foreign trade in economic development that attract foreign invaders towards India, resulting in changed administration in due course upto and after independence.

PSO 4: To provide life skills required for gainful employment by using domain knowledge such as Economic Service, Historians/ History writing and bureaucrats at various levels. To promote values such as sustainable development, Optimum utilisation of resources, patriotism, respecting the ideals of freedom struggle and responsible citizenship, political participation and socialisation.

B.Sc. Maths, Cloud Computing, Computer Science (MCCCS)

PROGRAM OUTCOMES (POS)

The graduates of this degree program will

PO-1 To develop problem-solving abilities using a computer system

PO-2 To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.

PO-3 To imbibe quality software development practices.

PO-4 To create awareness about process and product standards in developing software's

PO-5 To train students in professional skills related to Software Development Industry.

PO-6 To prepare necessary knowledge base for research and development in filed where we can use computer science.

PO-7 Upon completion of this program, students should have a good working knowledge of multimedia systems, its use, impact and importance.

PO-8 To design valid, well-formed, scalable, and meaningful multimedia applications using emerging technologies

PO-9 Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO-10 Having adaptive thinking and adaptability in relation to environmental context and sustainable development

PO-11 Having a clear understanding of professional and ethical responsibility

PO-12 Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

COMPUTER SCIENCE

PROGRAM OUTCOMES (POS)

The graduates of this degree program will:

- ☐ PO 1: Understand the concepts of key areas in computer science.
- ☐ PO 2: Analyze and apply latest technologies to solve problems in the areas of computer applications.
- ☐ PO 3: Analyze and synthesis computing systems through quantitative and qualitative techniques
- ☐ PO 4: Apply technical and professional skills to excel in business.
- ☐ PO 5: Communicate effectively in both verbal and written form.
- ☐ PO 6: Develop practical skills to provide solutions to industry, society and business.
- ☐ PO 7: Enhances analytical, managerial and communication skill besides inculcating the virtues of self-study.
- ☐ PO 8: Develop skilled manpower in the various areas of software industry and Information Technology
- ☐ PO 9: Develop abilities for data analysis and interpretation Using ICT.
- ☐ PO 10: Develop the basic programming skills to enable students to build Utility programs.
- ☐ PO 11: Develop the foundation for higher studies in the field of Computer Application.
- ☐ PO 12: Impart comprehensive knowledge with equal emphasis on theory and practice.

COMPUTER SCIENCE

PROGRAM SPECIFIC OUTCOMES (PSOS)

The graduates of this program will:

- ☐ PSO 1: An ability to apply knowledge of mathematics, computer science
- ☐ PSO 2: The program prepares the young professional for a range of computer applications, techniques of computer networking, software engineering, Web Designing, Big Data and Python.

□ PSO 3: An ability to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability in multidisciplinary teams with positive attitude.

□ PSO 4: An ability to communicate effectively.

Bsc (MCCCS) Maths, Cloud Computing And Computer Science

PROGRAM OUTCOMES (POS)

The graduates of this degree program will:

- PO 1: Apply the knowledge of mathematics, science, and computing to the solution of complex scientific problems.
- PO 2: Design solutions for complex problems using computing systems.
- PO 3: Analyse and apply latest technologies to solve problems in the areas of cloud computing
- PO4: Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO5: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 6: Create, select, and apply appropriate techniques, resources, and modern computing and IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
- PO 7: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.
- PO 8: Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 9: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10: Communicate effectively on complex activities with the scientific community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11: Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B.Sc. Botany, Chemistry, Horticulture B.Sc. (BCH)

PROGRAMME OUTCOME (POs)

After completion of the programme the students will be able to:

1. Transfer knowledge of Agriculture/Horticulture in the field of agricultural research

especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.

2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.
5. Establishment of models nurseries in rural areas for availability of quality planting materials.
6. Conservation and exploitation of biological diversity through crop management.
7. Prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losses.
8. The range of plant diversity in terms of structure, function and environmental relationships.
9. The evaluation of plant diversity.
10. Plant classification and the flora
11. The role of plants in the functioning of the global ecosystem.
12. A selection of more specialized, optional topics.
13. Statistics as applied to biological data.
14. Interpreting plant morphology and anatomy.
15. Plant identification.
16. Vegetation analysis techniques.
17. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry.
18. Analyze data using appropriate statistical methods and computer packages.
19. Plant pathology to be added for sharing of field and lab data obtained.
20. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
21. Solve the problem and also think methodically, independently and draw a logical conclusion.
22. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.
23. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
24. Find out the green route for chemical reaction for sustainable development.
25. To inculcate the scientific temperament in the students and outside the scientific community.
26. Use modern techniques, decent equipments and Chemistry software.

CHEMISTRY PROGRAM OUTCOMES

- Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
- Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both the scientists and public at large.
- Students will be able to explain why chemistry is an integral activity for addressing social, economic, and environmental.
- Students will be able to apply scientific concepts to face their life situations.
- Students are able to use modern instrumentation and classical techniques to design experiments and to properly record the results of their experiment.
- Knowing the proper procedures and regulations for safe handling and use of chemicals and can follow the proper procedures and regulations for safe handling of chemicals.
- safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine fields.
- Students are able to find more job opportunities in industries or in Govt. or in Private sector.

PHYSICS PROGRAM OUTCOMES

Course outcomes:

On successful completion of this course, the students will be able to:

Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross-section.

Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top.

Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.

Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields

Course outcomes:

On successful completion of this course, the students will be able to:

Understand the Newton's laws of motion and the law of conservation of linear momentum and its application to rocket motion, the concepts of concepts of impact parameter, scattering cross section and Distinguish between elastic and inelastic collisions.

Formulate the rotational kinematic relations, learn the working principle of gyroscope and its applications and explain the precessional motion of a freely rotating symmetric top.

Analyse the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

State the postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

Understand the phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.

State the laws of transverse vibrations in a stretched string and their verification using a sonometer and learn the formation of harmonics and overtones in a stretched string.

Acquire knowledge on Ultrasonic waves, their production and detection and their applications in different fields

Course outcomes:

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

Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.

Distinguish between Fresnel's diffraction and Fraunhofer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.

Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.

Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..

Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.

Explain about the different aberrations in lenses and discuss the methods of minimizing them.

Understand the basic principles of fibre optic communication and explore the field of Holography and Nonlinear optics and their applications.

Course outcomes:

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

Explain about the different aberrations in lenses and discuss the methods of minimizing them.

Understand the phenomenon of interference of light and its formation in Lloyd's single mirror Thin films and Newton's rings.

Distinguish between Fresnel's diffraction and Fraunhofer diffraction and observe the diffraction

patterns in the case of single slit and the diffraction grating.

Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.

Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity.

Comprehend the basic principles of laser and fibre optic communication and their applications.

DEPARTMENT OF HISTORY

HISTORY OUTCOMES

Course 1:

ANCIENT INDIAN HISTORY & CULTURE (from Indus Valley Civilization to 13th Cen A.D)

Learning Outcomes: After successful completion of this course, the student will be able to: Identify and define various kinds of sources and understand how history books are shaped Compare and contrast various stages of progress from IVC to Vedic age and analyze the Jain, Buddhist and Vedic faiths Increase the awareness and appreciation of Transition from Territorial States to Emergence of Empires Analyze the emergence of the Mauryan and Gupta empires during the classical age in India Evaluate the key facets of ancient society, polity and culture in South India the feudalism, and the rise of technology and commerce. Critically examine the nature of monarchic rule and develop an comprehensive understanding of cultural evolution during ancient period Visualize where places are in relation to one another through map pointing

Course 2:

MEDIEVAL INDIAN HISTORY & CULTURE (1206 A.D to 1764 A.D)

Learning Outcomes: After successful completion of this course, the student will be able to: Understand the socio, economic and cultural conditions of medieval India Describe the advent of Islam in India and study the traces of political and cultural expansion of Turks & Afghans Explain the Administration and art and architecture of Vijayanagar Rulers, Mughals and also analyse the rise of the Marathas and the contribution of Shivaji Evaluate the establishment of the British rule in India and understand the dangerous consequences disunity at all levels Analyze the emergence of composite culture in Indian Visualize where places are in relation to one another through map pointing

Course 3:

MODERN INDIAN HISTORY & CULTURE (1764-1947 A. D)

Learning Outcomes: After successful completion of this course, the student will be able to: Unearth the true nature of the British rule and its disastrous impact on Indian economy and society Gauge the disillusionment of people against the Company's rule even during the early 19th century Assess the causes and effects of Reformation movements and also inspire the public to overthrow inequalities of the present day society Rise above petty parochial issues after understanding the sacrificial saga of freedom Struggle Evaluate the undercurrent of communal politics that led to India's partition and identify the enemies of India's integrity and sovereignty Visualize where places are in relation to one another through map pointing

Course 4:

HISTORY & CULTURE OF ANDHRA (FROM 1512 TO 1956 AD)

Learning Outcomes: After successful completion of this course, the student will be able to:
Interpret social and political and cultural transformation from medieval to modern Andhra
Relate key historical developments during medieval period occurring in coastal Andhra and Telangana regions and analyze socio - political and economic changes under QutbShahi rulers
Understand gradual change, or change in certain aspects of society in Andhra, rather than rapid or fundamental changes Explain how the English East India Company became the most dominant— power and outline the impact of colonial policies on different aspects in Andhra
Outline the issues related to caste, women, widow remarriage, child marriage, social reforms and the laws and policies of colonial administration towards these issues Take pride in the non-violence struggle for Indian Independence and relate the importance of peace in everyday life
Apply the knowledge of the regional history to understand the regional, linguistic and other cultural aspirations of the present day society Visualize where places are in relation to one another through map pointing

Course 5:

HISTORY OF MODERN WORLD (From 15th Cent. AD to 1945 AD)

Learning Outcomes: After successful completion of this course, the student will be able to:
Demonstrate advanced factual knowledge of world histories, politics, and cultures Assess and appraise the developments in art, literature, and society during the Renaissance and utilize content knowledge of the Reformation and Counter Reformation to make predictions about the evolution of Christianity in Europe and Abroad Evaluate the causes for the Glorious Revolution and American Revolution and— identify the background for the evolution of human rights movement Understand the main events of the French Revolution and its significance in the shift— in European culture from Enlightenment to Romanticism Think how Russia's traditional monarchy was replaced with the world's first Communist state. Know how the world was affected people all over the world and the destruction they caused Develop the intellectual curiosity and habits of thought that will lead to life-long learning and continued engagement with European history, literature, culture, languages, and current affairs and acquire advanced international and intercultural competency through coursework in international studies Visualize where places are in relation to one another through map pointing

DEPARTMENT OF MATHEMATICS

OUTCOMES

COURSE-I

DIFFERENTIAL EQUATIONS

Outcomes:

1. After successful completion of this course, the student will be able to; Solve linear differential equations
2. Convert no exact homogeneous equations to exact differential equations by using integrating factors.
3. Know the methods of finding solutions of differential equations of the first order but not of the first degree.
4. Solve higher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients.
5. Understand the concept and apply appropriate methods for solving differential equations.

COURSE-II

THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY

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

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

COURSE-III

MATHEMATICS ABSTRACT ALGEBRA

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

1. acquire the basic knowledge and structure of groups, subgroups and cyclic groups.
2. get the significance of the notation of a normal subgroups.
3. get the behavior of permutations and operations on them.
4. study the homomorphisms and isomorphisms with applications.
5. understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems.
6. understand the applications of ring theory in various fields.

COURSE-IV

MATHEMATICS REAL ANALYSIS

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

1. get clear idea about the real numbers and real valued functions.
2. obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.
3. test the continuity and differentiability and Riemann integration of a function.
4. know the geometrical interpretation of mean value theorems.

COURSE-V

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

1. understand the concepts of vector spaces, subspaces, bases, dimension and their properties
2. understand the concepts of linear transformations and their properties
3. apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods
4. learn the properties of inner product spaces and determine orthogonality in inner product spaces.

POLITICAL SCIENCE

PROGRAMME SPECIFIC OUTCOMES – POLITICAL SCIENCE

Course-1: INTRODUCTION TO POLITICAL SCIENCE Learning Outcomes: On successful completion of the course the students will be able to;

- Recall the previous knowledge about Political Science and understand the nature and scope, traditional and modern approaches of Political Science.
- Understand concepts intrinsic to the study of Political Science.
- Have solid theoretical understanding of Rights and its theories along with the basic aspects of certain political ideologies.
- Apply the knowledge to observe the field level phenomena

Course-2: BASIC ORGANS OF THE GOVERNMENT Learning Outcomes: On successful completion of the course the students will be able to:

- Understand the Origin and Evolution of the concept of Constitutionalism and classification of Constitutions.
- Acquaint themselves with different theories of origin of State.
- Understand and analyses organs and forms of Governments along with a deep insight into the various agents involved in the political process.
- Apply the knowledge to analyse and evaluate the existing systems

Course-3: INDIAN GOVERNMENT AND POLITICS Learning Outcomes: On successful completion of the course the students will be able to:

- Acquire knowledge about the historical background of Constitutional development in India, appreciate philosophical foundations and salient features of the Indian Constitution.
- Analyze the relationship between State and individual in terms of Fundamental Rights and Directive Principles of State Policy.
- Understand the composition of and functioning of Union Government as well as State Government and finally
- Acquaint themselves with the judicial system of the country and its emerging trends such as judicial reforms.

Course-4 : INDIAN POLITICAL PROCESS Learning Outcomes: On successful completion of the course the students will be able to :

- Know and understand the federal system of the country and some of the vital contemporary

emerging issues.

- Evaluate the electoral system of the country and to identify the areas of electoral reforms.
- Know the constitutional base and functioning of local governments with special emphasis on 73rd & 74th Constitutional Amendment Acts.
- Understand the dynamics of Indian politics, challenges faced and gain a sensitive comprehension to the contributing factors.
- Apply the knowledge and critically comprehend the functioning of some of the regulatory and governance institutions.
- Propose theoretical outline alternate models

Course 5: WESTERN POLITICAL THOUGHT Learning Outcomes: On successful completion of the course the students will be able to:

- Understand the fundamental contours classical, western political philosophy, basic features of medieval political thought and shift from medieval to modern era.
- Understand the Social Contract Theory and appreciate its implications on the perception of State in terms of its purposes and role.
- Acquaint with the Liberal and Marxist philosophy and analyze some trends in Western Political Thought.
- Critically analyse the evolution of western political thought

ECONOMICS PROGRAM OUTCOMES

Programme outcome (PO): MICROECONOMIC ANALYSIS

At the end of the course, the student is expected to demonstrate the following cognitive abilities and psychomotor skills.

1. Remembers and states in a systematic way (Knowledge)
 - a. the differences between microeconomic analysis and macroeconomic analysis
 - b. various laws and principles of microeconomic theory under consumption,
2. Explains (understanding)
 - a. various terms and concepts relating to microeconomic analysis with the help of examples of real life
 - b. consumer's equilibrium and consumer's surplus using indifference curve analysis.
 - c. various laws and principles of consumption, production, and income distribution
 - d. determination of price and output discriminating different market conditions in short term and long term
3. Critically examines using data and figures (analysis and evaluation)
 - a. various laws and principles of microeconomic analysis and market conditions
 - b. application of the concept of demand elasticity and its relation with Average and Marginal Revenue
 - c. the relationship between average and marginal cost/revenue both in long term and

4. Draws critical diagrams and graphs to explain and examine the application of various laws and principles of microeconomic analysis
- 5.

MACROECONOMIC ANALYSIS

At the end of the course, the student is expected to demonstrate the following cognitive abilities and psychomotor skills.

1. Remembers and states in a systematic way(knowledge)
Various concepts, definitions, laws and principles of macroeconomic theory with reference to income, employment, money, banking and finance
2. Explains(understanding)
 - a. the difference between various concepts and components of national income with illustrations and methods of measuring national income
 - b. various terms, concepts, laws and principles, theories relating to income, employment, consumption, investment, money, price-level and phases of trade cycles
 - c. functions of commercial banks and central bank, creation and control of credit
3. Critically examines using data and figures (analysis and evaluation)
 - a. in order to understand the interrelationship between various components of national income
 - b. the theories of macroeconomics with reference to their assumptions, implications and applicability
 - c. Empirical evidences of Consumption and Investment Functions and factors influencing them
4. Draws critical formulae, diagrams and graphs.
 - a. consumption and investment functions; concepts of multiplier and accelerator
 - b. price indices, inflation and trade cycles

DEVELOPMENT ECONOMICS

At the end of the course, the student is expected to demonstrate the following cognitive abilities and psychomotor skills.

1. Remembers and states in a systematic way(Knowledge)
Various concepts and definitions and indicators relating to economic growth and Development including recent developments
2. Explains(understanding)
 - a. Distinction between growth and development with examples
 - c. Characteristics of developing and developing economies and distinction between the two
 - d. factors contributing to development, Choice of Techniques and a few important models and strategies of growth
3. Critically examines using data and figures (analysis and evaluation)
 - a. the theoretical aspects of a few models and strategies of economic growth
 - b. role and importance of various financial and other institutions in the

context of India's economic development

4. Draws critical diagrams and graphs.
 - a. to explain the models and strategies
 - b. to highlight empirical evidences to support the strategies

ECONOMIC DEVELOPMENT- INDIA AND ANDHRA PRADESH

At the end of the course, the student is expected to demonstrate the following cognitive abilities and psychomotor skills.

1. Remembers and states in a systematic way(Knowledge)
 - a. leading issues of Indian economic development with reference to potential for growth, obstacles and policy responses
 - b. Objectives, outlays and achievements of economic plans and growth strategies
2. Explains(understanding)
 - a. Available Resources, demographic issues, general problems of poverty and unemployment and relevant policies
 - b. Sector specific problems, remedial policies and their effectiveness relating to Agriculture and Industrial Sectors of Indian and AP economy and infrastructure issues of AP economy
 - c. Indian Tax system, recent changes, issues of public expenditure and public debt, recent finance commissions and devolution of funds
 - d. Major issues of economic development of Andhra Pradesh after bifurcation and Central assistance
3. Critically examines using data and figures (analysis and evaluation)
 - a. Leading issues of current importance relating to India and AP economy, major policies and programmes
 - b. Covid- 19 and its impact on Indian economy
4. Uses official statistical data and reports including tables and graphs
 - a. To explain the achievements of Indian economy with reference to the objectives of planning and policy and make critical evaluation

STATISTICAL METHODS FOR ECONOMICS

At the end of the course, the student is expected to demonstrate the following cognitive abilities and psychomotor skills.

1. Remembers and states in a systematic way(Knowledge)
 - a. the definitions, terms and their meaning relating to statistical methods
 - b. various formulae used to measure central tendency, correlation regression and Indices
2. Explains(understanding)
 - a. Importance of statistics and its applications
 - b. The method of classification of primary data
 - c. Uses of Correlation and Regression analysis, time series and index numbers in economic analysis
3. Analyses and solves using given data and information (analysis and evaluation)
 - a. different kinds of statistical problems using various principles and formulae relating to central tendency, correlation, regression, time series and indices
 - b. to interpret data and suggest solutions to economic problems
4. Draws critical diagrams and graphs.

- a. Histogram, Frequency Polygon and Frequency Curve
- b. More than cumulative and less than cumulative frequency curves (Ogive)
- c. Different types of Bar diagrams
- d. Pie Diagram and its uses in economic analysis

TELUGU OUCOMES

GENERAL TELUGU – 1

- * It gives broad knowledge about classical literature along with interdisciplinary approach.
- * Create awareness on Telugu language and literature like kavyas, Natakas , vyakaranam etc.
- *Bringing awareness about the evaluation of changes in literature since the period of Nannaya.
- *Study about different genres of literature right from 11th century.

GENERAL TELUGU – 2

- * It develops the overall personality of students and make them responsible and enlightened citizens of the society.
- * Students can learn how to write poetry, prose and fiction after studying these subjects , so they can involve in creative works.
- enlighten students about modern trends of literary concepts like poetry, drama, novel and criticism
- * Introducing Drama of literature, to learn about dramatization in modern times.

GENERAL TELUGU – 3

- *It develops an attitude in students to take Research in Telugu with emphasis on various aspects of historical and comparative study in language and literature.
- * Develops reading ability to solve verbal and Non verbal communication of the students
- It creates awareness among the students how to write for print media, electronic media . So that they can get employability in this field
- students can know the importance of learning multiple languages to get translator jobs in various fields

TELUGU LITERATURE OUTCOMES

- *Students can learn how to write poetry, prose and fiction after studying these subjects , so they can involve in creative works.
- *It develops an attitude in students to take Research in Telugu with emphasis on various aspects of historical and comparative study in language and literature
- *Student may turn as a literary critic.
- *It gives broad knowledge about classical literature along with interdisciplinary approach
- *Students can learn how to write poetry, prose and fiction after studying these subjects , so they can involve in creative works.
- * It gives broad knowledge about modern literature along with interdisciplinary approach
- *Students can know the Forms of literature relating poetry, Haiku, Historical epic and shathakam .
- * So that they try to understand history by reading literature.

- *Bringing awareness about the evaluation of changes in literature since the period of Nannaya.
- *Enlightening students about significance of ancient literature.
- *Creating awareness about Epics, besides introducing the epics like Mahabharatha
- *As well there feasibility to read history in the form of Literature.
- *Study about different genres of literature right from 17th century.
- *The outcome of it a student of language may turn in to student of literature.

Students can know the Forms of literature relating poetry, Haiku, Historical epic and shathakam

It develops an attitude in students to take Research in Telugu with emphasis on various aspects of historical and comparative study in language and literature

- *Awareness on origin of language since Before Christ, by this the importance of language and history is exposed.
- *knowledge about the semantical changes of vocabulary from time to time and dialects.
- * Origin of Telugu language in Dravidian languages and their relationship with Telugu language
- * As well empirical study of different language like Tamil, Malayalam , Telugu etc
- *Awareness on formation of language of respect of Telugu language.
- *Enrichment of language skills, phonetics and philology.
- * Develops reading ability to solve verbal and Non verbal communication of the students.
- * To bring language skills among the students.
- *The students comes to know about creativity about writing works.
- * Provides knowledge scientifically about Kavyas during the study.
- * And gains ability to become a writer as well as a critic.
- * Develops research bent of mind

Students may learn discipline, spontaneity and they can develop writing skills of News items. They may passionate towards Journalistic Career Students can develop language skills during their study

Students can know contemporary issues surrounded by us

Students know the construction of Telugu language, basics of the language and types of Sentence making

They get knowledge about verbal and non- verbal communication is changing time to time.

They know how they can express their thoughts in a poetial manner

While learning of this subject student may turn as linguist.

Student get command over the multi languages.

They know the importance of learning multiple languages.

This subjects explains how languages were constructed and spread

student knows about different types of cultures through this comparative study

Departments of Hindi

COURSE OUTCOMES

GENERAL HINDI – 1

CO1-To achieve the reading , writing, speaking and understanding skils

CO2-Analysing the development of Khariboli Hindi.

CO3- Understanding the cultural spirit of Mahaveer Prasad Dwivedi through his essay 'SahityakiMahatta', Ramchandrasukla through Mitrata and Sardarpurn Singh through SachiVerata.

CO4-Awareness regarding Hindi literature.

CO5-Understanding the change in content and style of expression in short stories indifferent periods through the stories of Premchand, Jai Sankar Prasad and Chandra dharsharmaGuleri.

GENERAL HINDI – 2

CO1- Bring awareness on folk culture.

CO2- Students can learn how to writeprose and fiction after studying these subjects , so they can involve in creative works.

CO3-Enlighten students about modern trends of literary concepts like drama, sort stories, novel and criticism.

CO4- Introducing to Hindi Grammar.

CO5-Understanding the Official Language Hindi.

CO6-Understanding various forms of writing in media

GENERAL HINDI – 3

CO1-It develops an attitude in students to take Research in Hindi with emphasis on various aspects of historical and comparative study in language and literature.

CO2- Students can learn how to write poetry and fiction, so they can involve in creative works.

CO3-Idea about the significance and importents of RastriyaBhasha.

CO4-Students can know the importance of learning multiple languages to get translator jobs in various fields.

CO5- Understanding the origin of Hindi language and its literature.

CO6- Identifying the dialects of Hindi language family.

CO7- Understanding the importance of translation and Understanding the concept of proof reading.

CO8- Understanding the concept of history of Hindi literature and understanding the importance and basis of the names given to each period of Hindiliterature.

CO9- Understanding the role played by the poets of Bhakti kal and adhunikkal in literature and society.

CO 10- Describing the progressive nature of santKabir and his writings

CO11- Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, cultural and political condition of that period.

Departments of Sanskrit

COURSE OUTCOMES

GENERAL SANSKRIT – 1

CO1*. Develop a strong concept of ancient Indian history, philosophy and literature.

CO2*. Enhance communication skills-Listening, Speaking, Reading, Writing.

CO3*.Students will be able to write Devnagariscripts which provide them paleographical knowledge to

read out the script of modern languages like Hindi.

CO4*. Increase in depth knowledge of the Core Areas of the subject.

CO5* Develops reasoning ability to solve verbal and non-verbal problems.

GENERAL SANSKRIT – 2

CO1*.Students will demonstrate the skill needed to participate in conversation that builds knowledge with collaboration.

CO2*.Reasonable understanding of multi-disciplinary relevance of literature of Sanskrit like Veda,

Philosophy, Grammar, Kavya, Smitisastra etc.

CO3*.To make them eligible for higher education.

CO4*Develop research aptitude and independent thinking.

CO5* Idea about the significance and sweetness of “ Divine language” (Sanskrit).

CO6* Bring awareness on folk culture.

GENERAL SANSKRIT – 3

CO1*.Students will be able to know not only ancient literature and their classification but also modern Sanskrit literature.

CO2*They will be manage their cognition, emotive apparatus, confusion and conflict of mind.

CO3*.They should general introduction of Indian Petrology and definitions and examples of various alankara.

CO4*.The students would learn about the ancient Indian Educational system and Polity, their nature, concepts through the text of Dharmasastra and Arthasastra.

CO5*.The students would know about the historical importance of Indian Epigraphy, Paleography, Chronology and Inscription.

Departments of Urdu

COURSE OUTCOMES

Students pursuing U/G Programme in URDU will be able to gain basic knowledge about the Language, and shall have a clear idea of the origin, development and history of Urdu language and Literature.

Students will be able to understand and explain various Literary Genres.

Further enhance communication skills in their own mother tongue.

Hone skills of Creative Writing, hence paving way for the development of creative ideas.

Understand, appreciate and adopt the principles of Human and Moral Values as portrayed in the various literary genres, especially in the Classical Literature.

DEPARTMENT OF URDU:

PROGRAMME SPECIFIC OUTCOMES:

PROSE GENRES: NOVEL-AFSANA-DRAMA

- ❖ Understand and explain salient features and characteristics of Literary Genres in Urdu
- ❖ Fiction viz., Novel, Short Story, Drama.
- ❖ Understand and explain the origin and development of Prose Genres in Urdu.
- ❖ Get knowledge about the salient features of Classical and Modern Prose in Urdu.

❖ Discuss and explain important aspects of the prescribed text.

PROSE GENRES: MAZMOON-INSHAIYA-KHAAKA-SAFAR NAMA-TARJUMA

- ❖ Understand and explain salient features and characteristics of Literary Genres in Urdu
- ❖ Non-Fiction viz., Article, Essay, Portrait & Sketch writing, Travelogue, Translation.
- ❖ Understand and explain the origin and development of these Prose Genres in Urdu.
- ❖ Discuss and explain important aspects of the prescribed text.
- ❖ Discuss, explain technics of Translation. Translate from English to Urdu.

POETRY GENRES: QASEEDA-MARSIYA-MASNAVI-RUBAYEE

- ❖ Understand and explain salient features and characteristics of Poetry Genres in Urdu viz., Qaseeda, Marsiya, Masnavi, and Rubayee.
- ❖ Understand and explain the origin and development of these Genres in Urdu Poetry.
- ❖ Study and explain the prescribed Text.
- ❖ Discuss and critically appreciate important poets viz., Meer Anees, Pandit Daya Shankar Naseem, and Amjad Hyderabad.

POETRY GENRES: GHAZAL-NAZM

- ❖ Understand and explain salient features and characteristics of Poetry Genres in Urdu viz., Ghazal, and Nazm.
- ❖ Understand and explain the origin and development of these Genres in Urdu Poetry, with special reference to the development of Urdu Ghazal in Rayalaseema.
- ❖ Study and explain the prescribed Ghazals and Nazms.
- ❖ Discuss and critically appreciate important poets of Ghazal and Nazm.

HISTORY OF URDU LITERATURE: URDU POETRY

- ❖ Understand and explain important theories pertaining to the the origin and development of Urdu Language and Literature.
- ❖ Understand and explain the development of Urdu Poetry from Dakani Period to Modern Period.
- ❖ Understand salient features and characteristics of Classical Urdu Poetry, with special reference to the impact of Delhi School and Lucknow School.
- ❖ Discuss the impact of various Literary Trends on Urdu Poetry.

HISTORY OF URDU LITERATURE: URDU PROSE

- ❖ Understand and explain the development of Urdu Prose from Dakani Period to Modern Period.
- ❖ Understand salient features and characteristics of Classical Urdu Prose.
- ❖ Discuss the role of Fort William College, Calcutta in the development of Urdu Prose in North India.
- ❖ Discuss the impact of various Literary Movements in Urdu viz., Aligarh Movement,

Progressive Movement, and Modernism Movement.

LITERARY CRITICISM: URDU TANQEED

- ❖ Understand and explain various theories regarding the importance and objectives of Literary Criticism.
- ❖ Understand and explain the development of Literary Criticism in Urdu, from Dakani Period to Modern Period.
- ❖ Study and Understand important aspects and characteristics of various Schools of Literary Criticism and their impact on Literary Criticism in Urdu.
- ❖ Discuss important Literary Critics in Urdu.

LITERARY CRITICISM & PROSODY: MUQADDAMA SHER-O-SHAYERI & BALAGHATH.

- ❖ Understand and explain the importance of MUQADDAMA SHER-O-SHAYERI in the history of Literary Criticism in Urdu.
- ❖ Explain important Literary Theories of Maulana Hali and discuss his contribution in the development of Urdu Literature in the Renaissance Era.
- ❖ Understand and explain importance of Prosody & Rhetorics. Discuss Important aspects of ILM-E-BAYAN viz., Tashbeeh, Iste-ara, MajazMursal, and Kanaya.
- ❖ Discuss Important aspects of ILM-E-BADEE' viz., Sana-yiLafzi, and Sana-yiMa'navi.

Biotechnology – Course Outcomes

BIOPHYSICAL TECHNIQUES

- CO1 It deals with the basic structure of carbohydrates, amino acids, nucleic acids and lipids
- CO2 Student knows some important pathways in cellular respiration
- CO3 It deals with fundamental biophysical techniques that are used extensively in pharmaceutical industries
- CO4 Student gain knowledge on the basic biostatistic terms

IMMUNOLOGY

- CO1 Student knows Microscopy - the basic structure of Microscope and principle involved in different types of microscopes
- CO2 Student gain knowledge on growth of microbes, their control, staining etc
- CO3 Basic concept of central dogma of molecular biology
- CO4 How the microbes are used to express our interest of protein

Biomolecules and Analytical techniques

- CO1 It deals with quantification of component using light by various spectrophotometric methods
- CO2 Separation of components present in a mixture based on their distribution coefficient
- CO3 Separation of components based on electric charge, molecular weight and sedimentation coefficient
- CO4 Basic concepts of tracer techniques using radio activity

Microbiology, cell and molecular biology

- CO1 Types of immunity, organs and cells involved in immune reactions
- CO2 Antigen and antibody structures and types; interactions between antigen and antibody
- CO3 Basics of transplantation of organs and vaccines
- CO4 Basic concepts and types of Hypersensitivity and autoimmunity

INDUSTRIAL BIOTECHNOLOGY

- CO1 Students learn the experiments to prove DNA as genetic material and the mode of replication
- CO2 The process of transcription
- CO3 Genetic code and the process of translation
- CO4 Gene regulation; Lac and Trp operons

PLANT AND ANIMAL BIOTECHNOLOGY

- CO1 Enzymes and vectors involved in cloning
- CO2 construction of Genomic and cDNA libraries, selection of clones
- CO3 DNA sequencing methods, Polymerase Chain reaction
- CO4 Methods used in production of transgenic organisms and their applications

PLANT AND ANIMAL BIOTECHNOLOGY

- CO1 Basic principles of Plant Tissue Culture and media preparation
- CO2 Micropropagation, Transgenic plants
- CO3 Basic principles of animal cell and Tissue Culture, components of media
- CO4 Artificial insemination, IVF; Bioethics and intellectual property rights

ENVIRONMENTAL BIOTECHNOLOGY

- CO1 General principles and introduction to ecosystem
- CO2 Pollutants present and detection
- CO3 Waste disposal methods
- CO4 Waste water treatment and bioremediation

MOLECULAR BIOLOGY

- CO1 Identification, preservation of industrially useful microorganisms
- CO2 Structure of bioreactor and its types
- CO3 Production of organic compounds
- CO4 Production of enzymes and single cell protein, hormones

rDNA TECHNOLOGY

MEDICAL BIOTECHNOLOGY

- CO1 Concepts of human genome project and genetic diseases
- CO2 Basic understanding of gene therapy and infectious diseases
- CO3 Immunity to infections, vaccines and transplantation technology
- CO4 Embryonic stem cells and molecular diagnostics; Bioethics

DEPARTMENT OF BOTANY

PROGRAMME OUT COMES

- 1.To understand the microbiology cell structures , replication of bacteria and viruses, evolution of species from primitive to Advanced ones
2. To study the Taxonomical, anatomical, physiological & reproduction in higher plants
3. Discuss about cell structure ,function of the plant genetics ,recombination methods of crop improvement
- 4.Environmental factors effects on plant growth regulations ,phyto geographical distributions of plants and conservation methods of biodiversity
5. To understand the nursery cultivation ,horticulture& floriculture propagation methods to get commercial income.

DEPARTMENT OF BOTANY

PROGRAMME SPECIFIC OUTCOMES

Microbial Diversity, Algae And Fungi

- Co1 Explain the Origin of life theories &Discovery of microorganisms With Special types of bacteria
- Co2 Describe the structure, Replication diseases caused & control measures of Viruses
- Co3 Understand the Cell structure ,Nutrition ,reproduction & Economic importance of Bacteria
- Co4 Discuss about Thallus organization ,Reproduction &Economic importance of different types of Algae
- Co5 Describe the types of non chlorophyllus thallophyte of Fungi including their economic importance

Microbial Diversity, Algae And Fungi

- Co1 To gain knowledge on equipments used in microbiology culture media preparation for microorganisms growth
- Co2 To study the viruses and bacteria using ICT tools for electro microphotographs of TMV Bacteriophage HIV bacillus
- Co3 Explain the staining of bacteria and plant diseases' caused by bacteria and viruses
- Co4 Slides preparation and study of internal structure of cyaneobacteria Algae and fungi
- Co5 Discusses about plant diseases' caused by fungi morphology anatomy of lichens

Diversity Of Archegoniate And Plant Anatomy

- Co1 Discuss about Bryophytes in which Evolution of sporophyte Thallus to leaf structures
- Co2 Describe the 1st true land plants with vascular systems of pteridophytes
- Co3 Describe the naked seed producing plants like Pinus & Gnetum (Gymnosperms).
- Co4 Explain the Tissues & Tissue systems in histological organization
- Co5 Discuss the Anomalous secondary growth in different plants &some local timber yielding

plants

Diversity Of Archegoniate And Plant Anatomy

- Co1 Identify the Bryophytes, Pteridophytes & Gymnosperms with slide preparation & mounting
- Co2 Demonstration & preparation of double staining slides
- Co3 Observation of tissues using permanent slides
- Co4 To study the wood anatomy in timber yielding plants
- Co5 Discuss about anomalous secondary growth in plants
- Co6 Effect of light intensity on oxygen evolution in photosynthesis using Wilmot bubbler method
- Co7 To study the rate of photosynthesis under different CO₂ concentrations

Plant Taxonomy And Embryology

- Co1 Explain the general introduction of plant taxonomy, nomenclature rules with taxonomic resources
- Co2 Discuss about types of classification, Bentham Hookers, Engler Prantles & phylogeny origin & evolution of Angiosperms
- Co3 To study the detailed information on plant taxonomy of Polypetalous
- Co4 Understand the taxonomic families belongs to Gamopetalae
- Co5 Explain the reproduction in plants, development of male & female gametes, zygote formation, embryo development & endosperm role in embryo development

Plant Taxonomy And Embryology

- Co1 Systematic study of locally available plants belongs to different family
- Co2 Demonstration of herbarium preparation techniques
- Co3 Discuss about pollen grain structure, mounts & pollen viability test in vitro germination
- Co4 Observe the permanent slides/photographs of different types of ovules & embryo sac development stages
- Co5 Using the slides and photographs of embryo & endosperm structure

Plant Physiology And Metabolism

- Co1 Explain the importance & properties of water in relation to plant physiological activities
- Co2 Discuss about role of mineral nutrients, Nitrogen metabolism & Enzymes activity in plants
- Co3 Describe the photosynthetic pathways & Translocation of organic solutes in plants
- Co4 Understand the respiration cycles through oxidative phosphorylation & lipid metabolism
- Co5 Explain the growth in plants, role of phytohormones, vernalization & photoperiodism.

Plant Physiology And Metabolism

- Co1 Demonstration of osmosis by potato osmoscope method
- Co2 Determination of osmotic potential of plant cell sap by plasmatic method using tradescantia leaves
- Co3 Understand the rate of transpiration using cobalt chloride method and rate of transpiration by Gagnon's photometer
- Co4 To study the effect of temperature on membrane permeability by calorimetric method
- Co5 Explain the mineral deficiency symptoms using plant photographs

Co6 Observe the separation of chloroplast pigments using paper chromatography technique

Cell Biology, Genetics & Plant Breeding

Co5 Understand the nature, structure of cell and their organelles', chromosomal organization & special type of chromosomes.

Co2 Discuss about DNA as a genetic material, structure of DNA & RNA, cell divisions with significance.

Co3 Explain the Mendel's laws of inheritance an over view of linkage & crossing over

Co4 Explain the process of plant breeding methods to crop improvement

Co5 Discuss about Biotechnological aspects of plant breeding in crop improvement

Cell Biology, Genetics & Plant Breeding

Co1 Study of structure of cell organelles through photomicrographs

Co2 Describe the structure of plant cell through temporary mounts

Co3 Discuss about DNA packing by micrographs and various stages of mitosis using cytological preparation of onion root tips

Co4 Knowledge gain on numerical problem solving using Mendel's Laws of Inheritance

Co5 Demonstration of hybridization techniques –Emasculation and bagging

Co6 Explain the calorimetric estimation of DNA by diphenyl amine method

Co7 Observe the slides different stages of meiosis & polytene chromosome

Plant Ecology And Phytogeography

Co1 Discuss about Ecological factors & interaction between plants and animals

Co2 Understand the productivity of an ecosystem ,energy transformation in food chain & food webs, recycling of elements in atmosphere

Co3 Understand the population & community ecology through ecological succession

Co4 Explain the phytogeography, distributional regions of India & World

Co5 Describe the biodiversity hot spots & seed bank resources in India, levels, loss & conservation of Biodiversity

Plant Ecology And Phytogeography

Co1 Explain the instruments used to measure micro climatic variables :Soil thermometer ,rain gauge ,anemometer luxmeter psychrometer

Co2 Determination of soil PH & permeability of different soil samples

Co3 Study of ecological adaptation of hydrophytes & xerophytes

Co4 Estimation of primary productivity of an ecosystem ,distribution of phytoplankton's & macrophytes in a pond ecosystem

Co5 Estimation of bicarbonates in the given water samples

Co6 Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method

Plant tissue culture and Biotechnology

Co1 To make the student to understand usage of Plant products and exploitation of them in tissue culture

Co2 On successful completion of the subject, the student should have understood: Crop development, Callus culture, Embryo culture etc.

- Co3 Students can understand different biotechnological techniques
Co4 Get the Knowledge on synthetic seeds , somatic hybrids
Co5 Get the Knowledge on genetically modified crops etc

HORTICULTURE

Programme Outcomes (POs):

After completion of the programme the students will be able to:

1. Transfer knowledge of Agriculture/Horticulture in the field of agricultural research especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.
2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.
5. Establishment of models nurseries in rural areas for availability of quality planting materials.
6. Conservation and exploitation of biological diversity through crop management.
7. Prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losses.

Course Outcomes (COs):

HORT-101: Propagation and Nursery Management of Horticultural Crops

1. Familiarization with principles and practices of propagation and nursery management for Horticultural Crops.
2. Study of introduction to propagation, cellular basis for propagation, sexual propagation, apomixis, polyembryony, chimeras. Principle factors influencing seed germination of horticultural crops, dormancy, hormonal regulation of germination and seedling growth.
3. Knowledge of nursery management, nursery establishment and nursery rules and regulation.

HORT- 102: PRODUCTION TECHNOLOGY OF COOL SEASON VEGETABLE CROPS

1. Educate production technology of cool season vegetables.
2. Imparting knowledge about botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post- harvest management, plant protection measures and seed production of vegetables grown in winter.

HORT-103: PRODUCTION TECHNOLOGY OF TEMPERATE FRUITS,

Impart basic knowledge about the importance and management of temperate fruits grown in India.

1. Study of commercial varieties of regional, national and international importance, ecophysiological requirements, recent trends in propagation, rootstock influence, planting system, cropping systems, root zone and canopy management, nutrient management, water management, fruit set and development, abiotic factors limiting fruit production, physiological of flowering, and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, precooling, storage, transportation and ripening techniques.
2. Knowledge of industrial and export potential, Agri Export Zones (AEZ) and industrial support of fruit business.

HORT -104: POST HARVEST MANAGEMENT FOR HORTICULTURAL CROPS

1. Facilitate deeper understanding on principles and methods of postharvest management of horticultural crops.
2. Maturity indices, harvesting practices for specific market requirements, influence of pre and post-harvest practices, respiration, transpirational loss.
3. Physiology and biochemical change during ripening, senescence, ethylene evolution and ethylene management, factors leading to post-harvest loss and its control, pre-cooling.
4. Study of post harvest loss and their control.

HORT-105: GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS

1. Teach the physiology of growth and development of horticultural crops.
2. Cellular structures and their function; definition of growth and development, growth analysis and its importance in Horticultural crops.
3. Physiology of dormancy and germination of seeds, tubers and bulbs; Role of auxins, gibberellins, cytokinins and abscissic acid; Application of synthetic hormones, plant growth retardants and inhibitors and modern PBRs for various purposes in horticultural crops.

HORT-201: PRODUCTION TECHNOLOGY OF TROPICAL AND DRY LAND FRUITS

1. Impart basic knowledge about the importance and management of tropical and dry land fruits grown in India.
2. Brief knowledge of commercial varieties of regional, national and international importance eco-physiological requirements, recent trends in propagation, rootstock influence, planting systems, cropping system, root zone and canopy management, nutrient management, water management, fertigation, role of bio regulators, abiotic factors limiting fruit production, physiology of flowering, pollination fruit set and development, honeybees in cross pollination, physiological disorders – causes and remedies, quality improvement by management practices; maturity indices, harvest, grading, packing, storage and ripening techniques; industrial and export potential, Agri. Export Zones (AEZ) and industrial support.

HORT-202: PRODUCTION TECHNOLOGY OF WARM SEASON VEGETABLE CROPS

1. Teach production technology of warm season vegetables.
2. Introduction to warm season vegetables, their botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post harvest management, plant protection

measures, economics of crop production and seed production.

HORT-203: LANDSCAPING AND ORNAMENTAL GARDENING

1. Familiarization with principles and practices of landscaping and ornamental gardening.
2. Landscape designs, its principles and practices of landscaping and ornamental Gardening structure, features.
3. Styles of garden, types of gardens: English, Mughal, Japanese, Persian, Spanish, Italian, Vanams, Buddha garden, Popular gardens of India.

HORT-204: PROTECTED CULTIVATION OF HORTICULTURAL CROPS,

1. Understanding the principle, theoretical aspects and developing skills in protected cultivation of horticultural crops.
2. Prospects of protected horticulture in India; Types of protected structures- Greenhouse, poly house, shade houses, rain shelters etc. Low cost/Medium, cost/High cost structures, Location specific designs; Structural components; Suitable horticultural crops for protected cultivation.

HORT-205: BIOTECHNOLOGY OF HORTICULTURAL CROPS, 4 Cr. (3 + 1)

1. Understandings the principles, theoretical aspects and developing skills in biotechnology of horticultural crops
2. Harnessing bio-technology in horticultural crops, influence of plant materials, physical, chemical factors and growth regulators on growth and development of plant cell, tissue and organ culture.
3. Callus culture types, cell division, differentiation, morphogenesis, organogenesis, embryogenesis. Cell culture, tissue and organ culture, hardening.

HORT-301: PRODUCTION TECHNOLOGY OF SUBTROPICAL FRUITS 4 Cr. (3 + 1)

1. Impart basic knowledge about the importance and management of subtropical fruits grown in India.
2. Study of commercial varieties of regional, national and international importance, eco-physiological requirements, recent trends in propagation, rootstock influence, planting system, cropping systems, root zone and canopy management, nutrient management, water management, fruit set and development, abiotic factors limiting fruit production, physiological of flowering, and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, precooling, storage, transportation and ripening techniques; industrial and export potential, Agri Export Zones (AEZ) and industrial support.

HORT-302: SPECIAL STATISTICAL METHODS IN HORTICULTURAL RESEARCH AND COMPUTER APPLICATION

1. Understanding the principle, theoretical aspects and developing skills in special statistical methods in horticultural crops and computer application.
2. Quantitative treatments factors, site selection and characterization.
3. Replication of experiments units, plot structure, plot type, plot size, plot shape, Guards and borders, Interference between plots.

HORT-304: PRODUCTION TECHNOLOGIES OF ORNAMENTAL PLANTS

1. Impart basic knowledge about the importance and production technology of cut flowers grown

in India.

2. Educate the students about scope of cut flowers in global trade, global scenario of cut flower production, varietal wealth and diversity, area under cut flowers and production problem in India- Patent right, nursery management, media for nursery, special nursery practices.

3. Growing environment, open cultivation, protected cultivation, soil requirements, artificial growing media, soil decontamination techniques, planting methods, influence of environmental parameters, light, temperature, moisture, humidity and CO₂ on growth and flowering.

HORT-305: PRODUCTION TECHNOLOGY OF MEDICINAL AND AROMATIC CROPS

1. Impart comprehensive knowledge about the production technology of medicinal and aromatic crops.

2. Study of Herbal industry, Indian system of medicine, indigenous Traditional Knowledge, IPR issues, Classification of medicinal crops, Systems of cultivation, Organic Production, Role of institutions and NGO's in production, GAP in medicinal crops production.

3. Knowledge of production technology for Senna, Periwinkle, Coleus, Aswagandha, Glory lily, Sarpagandha, Dioscorea sp., Aloe vera, Phyllanthus amarus, Andrographis paniculata.

HORT- 306: BREEDING OF HORTICULTURAL CROPS

Update knowledge on the recent research trends in the field of breeding of fruit crops with special emphasis on tropical, subtropical and temperate crops grown in India.

1. Evolutionary mechanisms adaptation and domestication, Genetic resource, cytogenetics, cytomorphology, chemotaxonomy, genetics of important traits and their inheritance pattern, variation and natural selection, spontaneous mutations, incompatibility systems in fruits, recent advances in crop improvement efforts- introduction and selection chimeras, apomixes, clonal selection, intergeneric, interspecific and intervarietal hybridization, mutation and polyploidy breeding, resistance breeding to biotic and abiotic stresses, breeding for improving quality, molecular and transgenic approaches in improvement of selected fruit crops.

HORT-401: PRESERVATION AND VALUE ADDITION IN FRUITS AND VEGETABLES

1. Teach the physiology and principle of fruit and vegetable preservation.

2. Fundamentals of preservation (principles and practices). Micro-organism associated with spoilage of fruits and vegetables. Source of micro-organism, conditions, infection and control.

3. Various methods of preservation like low temperature preservation, refrigeration, cellar storage, freezing, vacuum freezing, high temperature preservation.

HORT-402: SEED PRODUCTION TECHNOLOGY OF VEGETABLE

1. Educate principles and methods of quality seed and planting material production in vegetable crops.

2. Definition of seed and its quality, new seed policies; DUS test, scope of vegetable seed industry in India.

3. Genetical and agronomical principles of seed production; methods of seed production; use of growth regulators and chemicals in vegetable seed production; floral biology, pollination, breeding behaviour, seed development and maturation; methods of hybrid seed production.

HORT-403 : ORGANIC HORTICULTURE

Develop understanding of organic horticulture production system including Good Agricultural Practices (GAP).

- 1.Organic horticulture - definition, synonyms and misnomers, principles, methods, merits and demerits.
- 2.Impart knowledge of system for organic farming, components of organic horticultural systems, different organic input, their role in organic horticulture, role of Bio-fertilizers, bio-dynamics and its recent developments.
- 3.Impact of organic farming on eco-system.

Horticulture Programme Specific outcomes (PSOs):

- 1.Demonstrate a working knowledge and appreciation of the diversity of plants, their culture and utilization.
- 2.Apply horticultural principles to the successful growth and production of horticultural plants.
- 3.Demonstrate the knowledge, skills and attributes to be successful contributing members of the horticulture profession.
- 4.Synthesize and integrate information to solve horticultural problems.
- 5.Communicate effectively within the discipline and also be able to transmit knowledge and skills to lay-persons in the general public.
- 6.Apply concepts of horticulture science to select, manage, and improve plants and their products
- 7.Demonstrate competence with laboratory and/or field-based technologies used in modern horticulture
- 8.Anticipate and recognize problems, identify causes of these problems, quantify potential impacts, analyze options, identify viable solutions, and evaluate actions and consequences of treatments and interventions
- 9.Understand how global issues including climate change, energy use, water availability, and/or food safety impact sustainability of horticultural systems locally, nationally, and globally
- 10.Apply principles of accounting, business law, labor, marketing, and personnel management to a horticultural business and contribute to developing various components of a business plan
- 11.Quantify economic importance of plants in managed ecosystems and the impact of horticultural crops in food system

DEPT. OF ZOOLOGY

PROGRAM OUTCOMES (POS)

The Learning Outcomes of the programme could be in consonance with the Bloom's Taxonomy, which includes –

1. Remember (Lower order)
2. Understand (Lower Order)
3. Apply (Lower Order)
4. Analyze (Higher Order)
5. Evaluate & Problem Solving (Higher Order)
6. Create (Higher Order)

PO1Critical thinking: Able to understand and utilize the principles of scientific enquiry, think

analytically, clearly and evaluate critically while solving problems and making decisions during biological study. **PO2Effective communication:** Able to formally communicate Scientific ideas and investigations of the biology discipline to other using both oral and written communication skills.

PO3Social interaction: Able to develop individual behavior and influence society and social structure.

PO4Effective citizenship: Able to work with a sense of responsibility towards social awareness and follow the ethical standards in the society.

PO5Ethics: Ability to demonstrate and discuss ethical conduct in scientific activities.

PO6Environment and Sustainability: Able to understand the impact of biological science in societal and environmental contexts and demonstrate the knowledge for sustainable development.

PO7Self-directed and life-long learning: Able to recognize the need of life-long learning and engage in research and self-education.

DEPARTMENT OF ZOOLOGY

COURSE OUTCOMES

- ❖ Students will be able to apply the scientific method to questions of biology.
- ❖ Students will be able to identify major groups of animals to be able to classify them.
- ❖ Students will be able to explain how organisms function at the level of gene, genome, cell, tissue, organ and organ system.
- ❖ Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis.
- ❖ Students will be able to explain the structure & functions of major human organs.
- ❖ Students will obtain knowledge of fishery science, scientific tools of data collection in fishery science.
- ❖ Students should be able to demonstrate ecological interactions among organisms.
- ❖ Students will obtain knowledge of structure & functions ecosystems.
- ❖ Students will obtain the knowledge of marine environment and fauna living in the sea water.
- ❖ Students gain knowledge of evolution of various animals including human beings.
- ❖ Students will be able to explain how the life has originated from the non living things in the earth, different geological eras & animals which prevailed in different geological eras.
- ❖ chordata with suitable examples and larval stages in relation to the phylogeny

COURSE SPECIFIC OUTCOMES

Biology of Non-Chordates:

- ❖ Students would be able to understand the distinguishing characters, evolution and history of Non-chordae phyla.

❖ **Course Outcomes:** By the completion of the course the graduate should able to

—
CO1 Describe general taxonomic rules on animal classification

CO2 Classify Protozoa to Coelenterata with taxonomic keys

CO3 Classify Phylum Platyhelminthes to Annelida phylum using examples from parasitic adaptation and vermin composting

CO4 Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscs

CO5 Describe Echinodermata to Hemichordata

Biology of Chordates:

By studying this paper students would be able to understand different categories level of organization, evolutionary relationship and unique characters of various chordates.

CO1: Describe general taxonomic rules on animal classification of chordates

CO2: Classify Protochordata to Mammalia with taxonomic keys

CO3: Understand Mammals with specific structural adaptations

CO4: Understand the significance of dentition and evolutionary significance

CO5 : Understand the origin and evolutionary relationship of different phyla from Protochordata to mammalia.

CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION:

CO1 To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.

CO2 Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.

CO3 To understand the history of origin of branch of genetics, gain knowledge on heredity, interaction of genes, various types of inheritance patterns existing in animals

CO4 Acquiring in-depth knowledge on various aspects of genetics involved in sex determination, human karyotyping and mutations of chromosomes resulting in various disorders

CO5 Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins.

CO6 Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals for the benefit of the society

ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY:

CO1 Understand the functions of important animal physiological systems including digestion, cardio-respiratory and renal systems.

CO2 Understand the muscular system and the neuro-endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction.

CO3 Describe the structure, classification and chemistry of biomolecules and enzymes responsible for sustenance of life in living organisms

CO4 Develop broad understanding the basic metabolic activities pertaining to the catabolism and anabolism of various biomolecules

CO5 Describe the key events in early embryonic development starting from the formation of gametes up to gastrulation and formation of primary germ layers.

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

- CO1** To get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.
- CO2** To describe immunological response as to how it is triggered (antigens) and regulated (antibodies)
- CO3** Understand the applications of Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.
- CO4** Get familiar with the tools and techniques of animal biotechnology.

SKILL ENHANCEMENT COURSES

Course 6 A: SUSTAINABLE AQUACULTURE MANAGEMENT

- CO1** To get knowledge on the present status of aquaculture at the Global level and National level
- CO2** Students classify different types of ponds used in aquaculture
- CO3** Demonstrate induced breeding of carps
- CO4** Understand the Acquire critical knowledge on commercial importance of shrimps
- CO5** Identify fin and shell fish diseases

Course 7 A: POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES

- CO1** Identify the types of preservation methods employed in aquaculture
- CO2** Learn the suitable Processing methods in aquaculture
- CO3** Understand the maintain the standard quality control protocols laid down in aqua industry
- CO4** Identify the best Seafood quality assurance system

Course6 B: LIVE STOCK MANAGEMENT-I (BIOLOGY OF DAIRY ANIMALS)

- CO1** Students at the successful completion of the course will be able to Select the suitable breeds of livestock for rearing
- CO2** Relate the anatomy of udder with letdown of milk
- CO3** Identify and manipulate the reproductive behavior of cattle
- CO4** Inspect the economics of dairy farming
- CO5** Apprise the various breeding techniques employed in live stock

Course 7B: LIVE STOCK MANAGEMENT -II (DAIRY PRODUCTION AND MANAGEMENT)

- CO1** Identify and suggest the suitable housing system for the dairy farming
- CO2** Understand management practices for the dairy farming
- CO3** Learn the process of milk pasteurization
- CO4** Prepare cream from milk

Course6 C: POULTRY MANAGEMENT- I (POULTRY FARMING)

- CO1** Evaluate the status of Indian Poultry Industry

- CO2** Explain the Scientific Poultry keeping
- CO3** Compare the diversified Poultry practices
- CO4** Inspect the different breeds of chicken

Course 7 C: POULTRY MANAGEMENT -II (POULTRY PRODUCTION AND MANGEMENT)

- CO1** Suggest measure for Health care in Poultry
- CO2** Evaluate the economics of poultry production
- CO3** Elaborate the poultry Breeder flock management
- CO4** Differentiate the poultry hatchery practices

Course6 D: SERI CULTURE -I* (BIOLOGY AND CULTIVATION OF MULBERRY)

- CO1** Students at the successful completion of this course will be able to Evaluate the general status of Sericulture in India
- CO2** Understand the development of sericulture Botany
- CO3** Evaluate the use of Silk worm breeds
- CO4** Differentiate among various silkworm breeds
- CO5** Apprise the economics of silk rearing

Course 7 -D: SERICULTURE -II (BIOLOGY AND REARING OF SILKWORM)

- CO1** Design low cost rearing house preparation for silk worm rearing
- CO2** Formulate procedure of sanitation of rearing house
- CO3** Make use of Chawki rearing practice
- CO4** Decide and suggest the correct time for harvest
- CO5** Develop and Maintain the records related to sericulture

STATISTICS OUTCOMES

Paper - I: Descriptive Statistics
Course Learning Outcomes

Students will acquire

- 1) knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- 2) knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.
- 3) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
- 4) insights into preliminary exploration of different types of data.
- 5) Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

Paper - II: Probability Theory and Distributions

Course Learning Outcomes

Students will acquire

- 1) ability to distinguish between random and non-random experiments,
- 2) knowledge to conceptualise the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem,
- 3) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
- 4) knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hypergeometric, normal, uniform, exponential, beta and gamma distributions,
- (e) acumen to apply standard discrete and continuous probability distributions to different situations.

DEPARTMENT OF COMMERCE

B.COM (Gen) COURSE OUTCOMES

B.Com (General) Program Outcomes (POs)

At the end of the B.Com (General) Programme, graduates will be able to

PO1 Have comprehensive knowledge of Finance, Accounting, Taxation and Business laws.

PO2 Equip with professional, interpersonal and entrepreneurial skills.

PO3 Gear up with updated knowledge in implementing business practices

PO4 Prepare for post graduate studies and to achieve success in their professional careers.

B.Com (General) Program Specific Outcomes (PSOs)

PSO1 To cater to the manpower needs of companies in Accounting, Taxation, Business Laws, Auditing, Financial analysis and Management.

PSO2 To enrich communication, ethical values, team work, professional and leadership skill sets of students.

PSO3 To inculcate entrepreneurship and managerial skills in students so as to enable them to establish and manage their business effectively

PSO4 To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students with an assurance for good careers.

B.COM (CA) COURSE OUTCOMES

B.Com (CA) Programme Outcome (PO)

At the end of the programme, graduating students/graduates will be able to

PO1 Gain knowledge in commerce and accounting software for corporate requirements.

PO2 Get employment in IT fields, Software, Banks, Companies, BPOs and KPOs.

PO3 Demonstrate professional ethics in the social and legal aspects of commerce.

PO4 Integrate the ethical behaviour in self-learning, apply towards lifelong learning and acquiring knowledge in modern corporate and the IT sector.

B.Com (CA) Program Specific Outcome (PSO)

PSO1 Understand the concepts of commerce and computer application operations.

PSO2 Apply the current techniques, skills, and tools necessary for computing practices.

PSO3 Ability to design, implement domain knowledge for computer programming.

PG CHEMISTRY PROGRAMME OUTCOMES

M.Sc Organic Chemistry COURSE OUTCOMES

S. No	Year	Subject Code	Subject Name	Course Outcome code	Course Outcome
1	2020-21	15031	INORGANIC CHEMISTRY	C01	Explains the theories of bonding between metal and ligands
				C02	Applies HSAB principles in biological functions toxicology of metals and in medicine
				C03	Recognizes inert and labile complexes, Applies Trans effect in the synthesis of various desired products.
				C04	Describes the structure of metal carbonyls and metal nitrosyls
2		15032	ORGANIC CHEMISTRY	C01	Applies the inductive effect ,mesomeric effect and hyper conjugation in organic chemistry
				C02	Assess the thermodynamic and kinetic controlled products and methods of determination of reaction

				mechanisms.
			C03	Explains the reaction mechanism and stereochemistry of SN ¹ and SN ² reactions, NGP, factors influencing SN reactions
			C04	Able to construct three dimensional models of organic molecules, identifies absolute and relative configurations
3	15033	PHYSICAL CHEMISTRY	C01	Applies the Schrodinger wave equation to a particle in a box and harmonic oscillator rigid rotor and hydrogen
			C02	Explains the theory of reaction rates, rate expressions for opposing, parallel and consecutive reactions, rate Expressions for chain reactions
			C03	applies the concept of entropy in daily life, outline the electrochemical principles reversible concentration cells
			C04	Outline the electrochemical principles reversible concentration cells
4	15034	GENERAL CHEMISTRY	C01	Predicts the characteristic properties of molecules, structure and behaviour of molecules and crystals
			C02	Analyses the accuracy and precision of the statistical data
			C03	Applies the principles of microwave spectroscopy, IR spectroscopy and Raman spectroscopy in structural elucidation of compounds
			C04	Explains the principles selection rules and applications of ESR and Mossbauer spectroscopy
5	25031	INORGANIC CHEMISTRY	C01	Knows the importance Of organometallic compounds in industries
			C02	Understands the nature of bonding and structural features of transition metal π - complexes

				C03	Interprets the Electronic spectra of aqua complexes of Ti (III),V(III), and Cr(III) etc.
				C04	Explains the orbital and spin contributions, spin orbit coupling energies of J levels Curie law and Curie-Weiss law
6	25032	ORGANIC CHEMISTRY	C01	Analyses the conformations of the acyclic molecules, cyclic systems and hetero systems	
			C02	Draws the mechanisms of elimination, Esterification and ester hydrolysis	
			C03	Draws the mechanisms of various types of molecular reactions	
			C04	Draws reaction mechanism for various molecular rearrangement reactions	
7	25033	PHYSICAL CHEMISTRY	C01	Predicts the shapes and energies of molecular orbitals systems of organic molecules	
			C02	Knows the industrial importance of different types of catalysis	
			C03	Applies phase rule to three component systems, Stokes and Roozeboom plots	
			C04	Explains electrochemical passivity, theory of passivity, corrosion of metals, hydrogen evolution type.	
8	25034	SPECTROSCOPY	C01	Woodward and Fieser rules to calculate wavelength and IR spectroscopic study of Organic compounds	
			C02	Types of Nuclei , Chemical shift and Spin –spin coupling of Organic compounds	
			C03	CW and Ft techniques, ORD and DEPT applications	
			C04	Single and double focusing mass spectrometer , Mass spectral fragmentation of Organic molecules	
9	2020-21	35031	INORGANIC CHEMISTRY	C01	Applies Beer and Lambert's law in quantitative analysis

			C02	Explains the structure and functions of Biomolecules
			C03	Applies XPES to qualitative analysis-chemical shift-application to surface studies and structural analysis
			C04	Applies the knowledge of nanotechnology in synthesizing nano materials, characterization nonmaterial's XRD,SEM,TEM and AFM
10	35032	ORGANIC CHEMISTRY	C01	Applies principles of green chemistry in qualitative analysis and follows 3 R formula in daily life
			C02	Applies the principles of photochemistry in Norrish type-1 and Norrish type-2 reactions, Paterno-Buchi reactions, rearrangement of cyclohexenones
			C03	Identifies Antra facial and Supra facial additions in 4nand4n+2 Cyclo addition systems
			C04	Applies the knowledge of strategies in Asymmetric synthesis to various organic reactions to predict the nature of products
11	35033	PHYSICAL CHEMISTRY	C01	Explains structural and theoretical treatment of liquid interfaces, Thermodynamics of binary system
			C02	Determines number, weight and viscosity average molecular weights of polymers
			C03	Acquires the knowledge of advantages and limitations of fuel cells
			C04	Knows the applications of radio isotopes in cancer treatment
12	35034	CHROMATPGRAPHY AND MEDICINAL CHEMISTRY	C01	Elucidates the structure of orgnic compounds by using UV and IR Spectroscopy

			C02	Applies the principles of NMR spectroscopy in MRI scanning
			C03	calculates the chemical shifts in alkanes alkenes and alkynes
			C04	Interprets the spectral data of organic compounds using UV,VISIBLE IR and Mass spectra
13	45031	REAGENTS IN ORGANIC SYNTHESIS	C01	Draws the mechanism of different types of oxidation and reduction reactions
			C02	Explains the reactivity and applications non-metallic reagents like B,P and S compounds in organic synthesis
			C03	Able to synthesize different types of organic compounds of industrial importance using organometallic compounds
			C04	Draws the mechanism of advanced synthetic reactions and knows the concepts of organic synthesis
14	45032	DESIGNING AND MODERN TOPIOCS IN ORGANIC SYNTHESIS	C01	Applies synthetic strategies in drug designing
			C02	Applies disconnection approach in synthesis of acetylinic compounds Diels alder reaction and unsaturated compounds
			C03	Explains the basic principles of pharmaco kinetics and pharmaco dynamics
			C04	Applies Lead modification strategies in the discovery of oxaminquine
15	45033	CHEMISTRY OF HETEROCYCLILC COMPOUNDS	C01	Understands the knowledge of nomenclature and aromaticity of heterocycles
			C02	Draws the steps involved in synthesis and chemical reactions of 4 membered and 5membered heterocycles
			C03	Draws the steps involved in synthesis and chemical reactions of benzo fused

			5 membered and 6 memberd hetero cycles	
			C04	Explains the classification and mechanism and factors affecting enzyme catalysis
16	45034	CHEMISTYR OF NATURAL PRODUCTS	C01	Draws the steps involved in the structural elucidation of camphor,farnesol zingiberene and lanosterol terpenoids
			C02	Draws the steps involved in the structural elucidation of morphine,strychnine and reserpine alkaloids
			C03	Draws the steps involved in the structural elucidation of steroids like androsterone,testosterone,estrogene and progesterone
			C04	Students will gain an understanding of how health, disease and modern medicine are all rooted in biological chemistry.

M.COM (REGULAR) PROGRAM OUTCOME

PURPOSE OF THE COURSE:

The commerce stream has witnessed a sea change over the past decades, with a range of specializations and career options emerging in recent years. Commerce education is specialization to develop the required knowledge, skills and attitudes for the successful handling of trade, commerce and industry.M.Com is the most exalted two year full time postgraduate programme in commerce. The 2-year course delves deeper into the functioning of the economy, capital, revenue, trade, taxes, etc. taught in B.Com. The course aims at providing specialization to the students in the field of Finance and Marketing. The course provides an extreme and rigorous base for teaching, research and allied business administration. The programme is well received in the industry and for years had been serving the needs of managerial cadre. The course serves the needs of academics and prepares students for research and teaching.

PROGRAMME OBJECTIVES:

The aim of this Programme is to develop Commerce professionals with specialized skills and

applied competencies in theoretical and practical knowledge of Finance and Marketing that will cater the contemporary needs of industry and academia by providing student-centric learning ambience backed with critical thinking and problem solving capabilities. The main objective of this Programme is to train the student to develop conceptual, applied and research skills as well as competencies required for effective problem solving and right decision making in routine and special activities relevant to financial management, security market transactions, corporate governance practices, and marketing management of a business. The Programme will enable students:

- ❖ To provide a systematic and rigorous learning and exposure to Banking and Finance related disciplines.
- ❖ To train the student to develop conceptual, applied and research skills as well as competencies required for effective problem solving and right decision making in routine and special activities relevant to financial management and Banking Transactions of a business.
- ❖ To acquaint a student with conventional as well as contemporary areas in the discipline of Commerce.
- ❖ To enable a student well versed in national as well as international trends.
- ❖ To facilitate the students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors nature of various financial instruments.
- ❖ To provide in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment, Research Methodology and Tax planning.

PROGRAM SPECIFIC OUTCOME:

- After completing Masters in Commerce students are able to develop an ability to apply knowledge acquired in problem solving.
- Ability to work in teams with enhanced interpersonal skills and communication.
- The students can work in different domains like Accounting, Taxation, HRM, Banking and Administration.
- Ability to start their own business.
- Ability to work in MNCs as well as pvt. and public companies.

- To develop team work, leadership and managerial and administrative skills.
- Students can go further for professional courses like CA/ CS/CMA/CFA.

SKILLS:

The students after completing the program should inculcate the following skills:

- ❖ The techniques of managing the business with special focus on marketing and finance.
- ❖ Application oriented research through research for business decisions.
- ❖ Effective use of Statistical methods for analysis of business data.
- ❖ Adopt a suitable corporate tax planning and management for the growth of business within the legal framework.
- ❖ Investment and portfolio management skill to examine different investment schemes with respect to risk and return and to construct optimum portfolio.
- ❖ Adopt a reflective approach to personal development and embrace the philosophy of continual professional development.
- ❖ Plan and undertake independent research in a chosen discipline.

COURSE OUTCOMES

M.COM (PART I) AND (PART II)

SEMESTER – I

ORGANISATIONAL BEHAVIOUR:

-  To provide in depth knowledge about process of formation of group behavior in an organization set up
-  To make the students understand various concepts of organization behavior.
-  To help the students to understand the human behavior in business organizations and its influence on organizational change, development and effectiveness.

MANAGERIAL ECONOMICS:

-  To enable the students to understand economic concepts, theories, fundamentals as aids to decision making under given environmental constraints.
-  To study the problems and significance of Industrialization.
-  To learn the impact of Industrialization on Indian Economy

BUSINESS ENVIRONMENT AND POLICY

- ✚ To understand the students with a background of various environmental factors of business.
- ✚ To understand and know the impact of globalization on trade, commerce and industry.
- ✚ To learn the growth and development of Indian Industries.

CORPORATE FINANCIAL ACCOUNTING

- ✚ To expose the students to advanced corporate financial accounting issues and practices.
- ✚ To describe the basic understanding and issuing principles & Procedures of Accounting Standards, Ind. AS & IFRS.
- ✚ Interpret and illustrate the Investment Accounts with relevant accounting standard. Explain Accounting for Voyage Accounts, & Royalty Accounts.
- ✚ Learn the deep insight of all the accounting aspects of liquidation of company.
- ✚ Describe accounting treatments for corporate events like Amalgamation, Reconstruction and Restructuring and interpreting the relevance of various accounting regulations and provisions related to such events in context of existing legal and regulatory environment.

COMPUTER APPLICATIONS IN BUSINESS

- ✚ To acquisition, processing and organization of data. Main aim of the subject is to make students know and learn about computers through its applications.
- ✚ Students will be able to use the accounting package on their own.
- ✚ Students will know the use and functioning of DBMS.
- ✚ Students will be able to work with MS-Word, MS-Excel and MS-Power Point.
- ✚ Students will be familiar with formatting text and document, working with graphics and creating presentation.
- ✚ Students will be able to use the various applications of internet in performing business operations. 6. Students will be able to understand the concept of internet, internet security, e-mail, World Wide Web and internet browsing.

SEMESTER-II

HUMAN RESOURCE MANAGEMENT

- ❖ To provide basic knowledge of various facets of selection, training and development of human resources in the organization.
- ❖ HRM makes an attempt to bring some sort of outlook on an organization and its employees together to work together to achieve their goals.
- ❖ It points how inherent abilities, acquired knowledge, aptitude, talents and skills of the persons employed in the organization.
- ❖ Students will understand the perspective of human resource management viz., normative perspectives, critical perspectives, behavioral perspective, and strategic perspective.

FINANCIAL MANAGEMENT

- ❖ To expose the students to the various issues, concepts and in-depth study of financial management to take the management decisions effectively.
- ❖ Explain the concept of leverage and benefits of cost associated with debt financing.
- ❖ Understand the common factors influencing capital structure and the capital structure theories. Identify relevant cash flows for capital budgeting projects and apply various methods to analyze projects.
- ❖ Explain and calculate capital budgeting and allocation.
- ❖ Equip the students with details about mergers and acquisitions
- ❖ Provide detailed explanation of derivative instruments.

RESEARCH METHODOLOGY FOR BUSINESS

- ❖ To make the students familiar with the Research and Statistical Techniques and their applications in business decision making.
- ❖ To study the model and process of research and its applications in business environment.
- ❖ Use of statistical tools and techniques for research viz., exploratory, conclusive and causal research.
- ❖ To study the need of data types, variables, scaling and tabulation.
- ❖ To use statistical techniques for analysis of research data.
- ❖ Research applications in market survey and skills needed in drafting the report.

E-COMMERCE

- ❖ To help the students to know about the contents of e-commerce and its practices in business.

- ❖ Threats in e-commerce and to know about encryption and its types
- ❖ Provides knowledge on Electronic Data Interchange and different payment options
- ❖ To deal more securely while dealing in an electronic mode
- ❖ Familiarize with the framework for mobile commerce and the impact of technology advances
- ❖ The wireless application protocol which makes the student to know about the data access. Intended outcome of the course is to demonstrate an understanding of e-commerce analyzing information systems for business and management. To enable the reader to understand the different ways to keep the confidentiality of organizational data through encryption this is rather a basic requirement for being in business.

SEMESTER-III

ACCOUNTING FOR MANAGERIAL DECISIONS

- ❖ To help the students to know the accounting theory and practices while making the managerial decisions.
- ❖ To train the students to make short run decisions by considering the contribution and profit analysis
- ❖ To enable them to understand the various techniques for inter firm comparison and divisional performance
- ❖ To make them familiar with responsibility accounting to assign the profit or cost or revenue to the respective centre's
- ❖ To understand the importance of P/V ratio in the short term decision making process
- ❖ To learn the preparation of functional budgets this course enables the students to be better decision makers by considering various parameters which influence decision making. They can support the management in taking up decisions amidst alternatives. The reader will be better equipped to prepare different kinds of budget required by the organization.

CORPORATE TAX AND GST

- ❖ To describe the theoretical and practical knowledge of taxation to the students.
- ❖ It enables the student to have fair knowledge on indirect taxes, features and government tax policies

- ❖ Explain the structure of Central excise and salt act-levy of excise duty and classification of excise goods
- ❖ To provide a complete insight into customs act
- ❖ To analyze the constitutional background of Central sales tax.

ACCOUNTING PACKAGE - TALLY

- ❖ Computer Application is useful for acquisition, processing and organization of data. Main aim of the subject is to make students know and learn about computers through its applications.

SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

- ❖ To enable the students to learn various methods analyzing securities and building portfolios under various economic environmental situations.
- ❖ Security Analysis extends the knowledge and skills of finance students from investment perspective.
- ❖ Theories and techniques that are practiced in assessing the fair value of securities based on different constraints.
- ❖ Professional approach towards understanding the concept of investment.
- ❖ Security Analysis focuses on the theories and techniques that has profound effect on professional behavior and practice in the real world. Students will get exposure to the different investment avenues with their relative benefits.
- ❖ It focuses on selection of investments by addressing the risk in a more efficient manner.
- ❖ Understanding the needs of the clients, design portfolios consisting of different assets.
- ❖ To suit those needs of the clients, ensure the returns from the funds and associated risk as per expectations.
- ❖ Management of portfolios on behalf of others according to their needs and requirements - to maximize the investments expected return at appropriate level of risk exposure. Students will acquire knowledge to understand the difference between the success and failure of any type of portfolio.

MARKETING RESEARCH

- ❖ To familiarize the students about the conceptual frame work of marketing research and its various issues.
- ❖ Make the students to understand the fundamentals of business marketing.
- ❖ To enable them to establish a better customer relationship and
- ❖ To handle the supply chain management in the most appropriate way.
- ❖ To make them well acquainted with the Marketing intelligence system.
- ❖ To control the marketing channels and marketing logistics The student can better handle the marketing positions through the techniques of better customer management and channel management. The challenging nature of business marketing positions exercises more pressure on the capability of formulating and implementing business marketing strategies. This course enables the reader to handle it in a way.

FINANCIAL MARKETS AND SERVICES

- ❖ To provide to students an understanding of financial markets and institutions involved in providing services to the organizations.
- ❖ To make students aware about various financial services having in our country and in the world and how it is working.
- ❖ To make them expert personnel in the field of financial services provider and due to this they will be helpful in making strong economy.

SERVICES MARKETING

- ❖ To provide a deeper insight into the marketing management of companies in offering services as a product.
- ❖ To emphasize the significance of services marketing in the global economy
- ❖ To make the students understand the deeper aspects of successful services marketing
- ❖ To provide insights to the challenges and opportunities in services marketing. Course Outcome: understanding the concept of successful services marketing and ability to face the challenge in service marketing.

SEMESTER-IV

SOFT SKILLS FOR CAREER DEVELOPMENT

- ❖ To equip students with the most needed soft skills, positive attitude, personality development skills, communication skills, time management and interview skills.

ENTREPRENEURSHIP DEVELOPMENT

- ❖ To coin the students about the conceptual framework of entrepreneurship development along with financial institutions aiding to Entrepreneurship Development in India.
- ❖ Understand the institutional support to entrepreneurs
- ❖ Describe the Women Entrepreneur
- ❖ Classify the challenges of women entrepreneur
- ❖ Describe the Project management
- ❖ Identify the evaluation of Project

FINANCIAL DERIVATIVES

- ❖ To acquaint the student with the risk management techniques of derivative trading in Forex markets.
- ❖ The successful completion of this course shall enable the students:
- ❖ To have a good understanding of derivative securities.
- ❖ To know the regulatory framework for Derivatives Market in India.
- ❖ To know how forward contracts, futures contracts, swaps and options work, how they are used and how they are priced
- ❖ To describe and explain the fundamental features of a range of key financial derivative instruments
- ❖ To decide which securities to use for hedging and/or speculative purposes

RETAIL MARKETING MANAGEMENT

- ❖ To enable the students to have a deeper insight and motivate them towards retail sector.

INTERNATIONAL FINANCIAL MANAGEMENT

- ❖ To acquaint the students to the conceptual framework of international monetary system and foreign exchange risk analysis.
- ❖ To understand the finance functions in multinational firms and the risk and return associated with them
- ❖ To examine the Balance of Payments (BOP) data and determine its implications for international competition.
- ❖ To describe the international monetary system and the foreign exchange markets.
- ❖ To identify the processes and instruments used in the financing of international trade.

- ❖ To identify and appraise investment opportunities in the international environment.
- ❖ To understand the types of transactions and mechanism of Currency Dealing in international market.
- ❖ To convert currencies using spot, future, and cross rates and identify arbitrage opportunities.
- ❖ To forecast exchange rates based on the parity conditions that should apply between spot rates, forward rates, inflation rates, and interest rates.
- ❖ To explain translation, transaction, and economic exposure to exchange rate changes.
- ❖ To know the concepts of International capital Budgeting and International Taxation.

INTERNATIONAL MARKETING

- ❖ To make the students with a perspective of International Marketing, its environment and complexities.
- ❖ Growing importance of global business in economic scenario has made the course to provide objectives of learning as:
- ❖ To inform evolution of international business
- ❖ To understand causes of globalization.
- ❖ Provide impact of global business on Indian economy
- ❖ It provides knowledge on theories of foreign trade
- ❖ Familiarize with international markets and its peculiarities
- ❖ Understand theories of foreign trade, foreign capital flow and its trends this course enables to undertake various assignments in foreign trade such as work with indent house to arrange for buying and selling of goods and services, foreign currency provider/supplier. Serve with international financial institutions and to have an access to international market information provider and also act as intermediary in foreign trade

PROJECT REPORT AND VIVA VOCE

- ❖ The successful completion of project Report followed by Viva voce shall enable students:
- ❖ To widened theoretical knowledge with the help of practical knowledge.
- ❖ To develop practical and analytical thinking skill.
- ❖ To develop problem solving skill

OPEN ELECTIVE PAPER THEORY

STOCK MARKETS

- ❖ To create awareness and practical exposure about Stock Market Operations.
- ❖ To acquire knowledge on primary and secondary market
- ❖ To acquire knowledge on methods of selling new issue
- ❖ To understand the compliance part of SEBI
- ❖ To understand the price stabilising mechanism through Green Shoe Option
- ❖ To know the different methods of speculative trading such as call option and put option, wash sales and so on
- ❖ To know the preparation or prospectus The student will have a fair knowledge on stock market operations and the compliance part of SEBI, the governing body for stock markets. The different methods of placing securities and to participate book building process will be a part of the learning process. There is ample scope for undertaking stock broking and work as a market adviser for organizations. They also get to know the international stock market operations.

BANKING AND INSURANCE SERVICES

- ❖ To create awareness about the Banking and Insurance services which are rendering service in India.
- ❖ To familiarize the students about the role of monetary and credit policy
- ❖ To make them well acquainted with IRAC norms and securitization act
- ❖ To understand BASEL II and III norms
- ❖ To learn about innovations in the new era
- ❖ To make them understand about prudential norms, the different banking institutions. This develops capabilities to comprehensively understand the changing dynamics in banking and financial services through innovations in global markets and to know the compliance factor regarding the banking system.



GOVT. COLLEGE FOR MEN (AUTONOMOUS) :: KADAPA

Re accredited by NAAC at B Grade

SKILL DEVELOPMENT COURSES

NAME OF THE COURSE	CODE
Public Relations	1016
Insurance Promotion	1017
Plant Nursery	1018
Electrical Appliances	1019
Performing Arts	2018
Survey And Reporting	2019
Business Communication	2020
Logistic And Supply Chain Management	2021
Fruit And Vegetable Preservation	2022
Dairy Technology	2023
Food Adulteration	2024
Solar Energy	2025
Financial Markets	3019
Retailing	3020
Environmental Audit	3021
Poultry Farming	3022

DAIRY TECHNOLOGY
ELECTRICAL APPLIANCES
FINANCIAL MARKETS
FOOD ADULTERATION
INSURANCE PROMOTION
LOGISTICS AND SUPPLY CHAIN MANAGEMENT
PERFORMING ARTS
PUBLIC RELATIONS
SURVEY AND REPORTING
PLANT NURSERY
BUSINESS COMMUNICATION
FRUIT AND VEGETABLE PRESERVATION
SOLAR ENERGY
RETAILING
ENVIRONMENTAL AUDIT
POULTRY FARMING

DAIRY TECHNOLOGY

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

Learning Outcomes:

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

1. Understand the pre-requisites for starting a Dairy farm
2. Recognize different breeds of Cows & buffaloes following safety precautions.
3. Prepare and give recommended feed and water for livestock
4. Maintain health of livestock along with productivity
5. Vaccination of cattle, nutrients requirements
6. Entrepreneurship i.e., Effectively market dairy products
7. Ensure safe and clean dairy farm and Standard safety measures to be taken in establishing an industry
8. Efficiently start and manage to establish or develop a Dairy Industry

SYLLABUS:

Section I (Introduction and Establishment of a Dairy Farm): 05 Hrs

- 1.1 Dairy development in India – Dairy Cooperatives (NDRI, NDDB, TCMPF)(1hr)
- 1.2 Constraints of Present Dairy Farming and Future Scope of Dairy Farmer.(1 hr)
- 1.3 Selection of site for dairy farm; Systems of housing – Loose housing system, Conventional Dairy Farm; Records to be maintained in a dairy farm. (2 hrs)

Section II (Livestock Identification and Management): 13 Hrs

- 2.1 Breeds of Dairy Cattle and Buffaloes – Identification of Indian cattle and buffalo breeds and Exotic breeds; Methods of selection of Dairy animals. (5 hrs)
- 2.2 Systems of inbreeding and crossbreeding. (2 hrs)
- 2.3 Weaning of calf, Castration, Dehorning, Deworming and Vaccination programme (3 hrs)
- 2.4 Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks. (3 hrs)

Section III (Feed Management, Dairy Management, Cleaning and Sanitation): 8 Hrs

3.1 Basic Principles of Feed, Important Feed Ingredients, Feed formulation and Feed Mixing(2 hrs)

3.2 Operation Flood –Definition of Milk and Nutritive value of milk and ICMR recommendation of nutrients –Per Capita Milk production and availability in India and Andhra Pradesh -Methods of Collection and Storage of Milk–Labelling and Storage of milk products (4 hrs)

3.3 Cleaning and sanitation of dairy farm – Safety precautions to prevent accidents in an industry. (2 hrs)

Co-curricular Activities Suggested: (4 hrs)

1. Group discussion&SWOT analysis
2. Visit to a Dairy Farm
3. Visit to Milk Cooperative Societies
4. Visit to Feed Milling Plants
5. Market Study and Identification of Government Schemes, Insurance and Bank Loans in relation to dairy farming

Reference books:

1. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company
2. Principles and practices of Dairy Farm –Jagdish Prasad
3. Text book of Animal Husbandry - G C Benarjee
4. Hand book of Animal Husbandry - ICAR Edition
5. Outlines of Dairy Technology – Sukumar (De) – Oxford University press
6. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House.
7. The technology of milk Proceesing – Ananthakrishnan, C.P., Khan, A.Q. and Padmanabhan, P.N. – Shri Lakshmi Publications.
8. Dairy India 2007, Sixth edititon
9. Economics of Milk Production – Bharati Pratima Acharya Publishers.
10. <http://www.asci-india.com/BooksPDF/Dairy%20Farmer%20or%20Entrepreneur.pdf>
11. <https://labour.gov.in/industrial-safety-health>

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8. Dairy India 2007, Sixth edition
9. Economics of Milk Production – Bharati Pratima Acharya Publishers.
10. <http://www.asci-india.com/BooksPDF/Dairy%20Farmer%20or%20Entrepreneur.pdf>
11. <https://labour.gov.in/industrial-safety-health>

ELECTRICAL APPLIANCES

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

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.
2. Understand the working principles of different household domestic appliances.
3. Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

SYLLABUS:

UNIT-I (6 hrs)

Voltage, Current, Resistance, Capacitance, Inductance, Electrical conductors and Insulators, Ohm's law, Series and parallel combinations of resistors, Galvanometer, Ammeter, Voltmeter, Multimeter, Transformers, Electrical energy, Power, Kilowatt hour (kWh), consumption of electrical power

UNIT-II (10 hrs)

Direct current and alternating current, RMS and peak values, Power factor, Single phase and three phase connections, Basics of House wiring, Star and delta connection, Electric shock, First aid for electric shock, Overloading, Earthing and its necessity, Short circuiting, Fuses, MCB, ELCB, Insulation, Inverter, UPS

UNIT-III (10 hrs)

Principles of working, parts and servicing of Electric fan, Electric Iron box, Water heater; Induction heater, Microwave oven; Refrigerator, Concept of illumination, Electric bulbs, CFL, LED lights, Energy efficiency in electrical appliances, IS codes & IE codes.

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]

1. Studying the electrical performance and power consumption of a given number of bulbs connected in series and parallel circuits.
2. Measuring parameters in combinational DC circuits by applying Ohm's Law for different resistor values and voltage sources
3. Awareness of electrical safety tools and rescue of person in contact with live wire.
4. Checking the specific gravity of lead acid batteries in home UPS and topping-up with distilled water.
5. Identifying Phase, Neutral and Earth on power sockets.
6. Identifying primary and secondary windings and measuring primary and secondary voltages in various types of transformers.
7. Observing the working of transformer under no-load and full load conditions.
8. Observing the response of inductor and capacitor with DC and AC sources.
9. Observing the connections of elements and identify current flow and voltage drops.
10. Studying electrical circuit protection using MCBs, ELCBs
11. Assignments, Model exam etc.

Reference Books:

1. A Text book on Electrical Technology, B.L.Theraja, S.Chand & Co.,
2. A Text book on Electrical Technology, A.K.Theraja.
3. Performance and design of AC machines, M.G.Say, ELBSEdn.,
4. Handbook of Repair & Maintenance of domestic electronics appliances; BPB Publications
5. Consumer Electronics, S.P.Bali, Pearson
6. Domestic Appliances Servicing, K.P.Anwer, Scholar Institute Publications

FINANCIAL MARKETS

Total 30 hrs (2hrs/wk) 02 credits & Maximum 50 Marks

Learning Outcomes:

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

1. Acquire knowledge of financial terms
2. Know the concepts relating to and markets and different avenues of investment
3. Understand the career skills related to Stock Exchanges
4. Comprehend the personal financial planning and money market skills

Syllabus

UNIT-I: 06hrs

Indian Financial System- its components - Financial markets and institutions

UNIT-II: 10hrs

Capital Market - its function - organizations - elements - (shares, debentures, bonds, mutual funds) debt market - Equity market (SEBI) and secondary market (NSE)

UNIT-III: 10hrs

Money market - Organized - Unorganized - Sub market (call money, commercial bills, Treasury bill, Certificate of Deposit, Commercial papers)

Co-curricular activities: (04 hrs)

1. Collection and study of pamphlets, application forms etc.
2. Invited lectures on the field topics by local experts
3. Introducing Online classes from NSE
4. Field visit to mutual fund offices/share brokers
5. Observation, study and analysis of selected companies share prices
6. Assignments, Group discussion, quiz etc.

Reference books:

1. T.R. Jain R.L.Sarma - Indian Financial System- VK Global publisher
2. Jithendra Gala - Guide to Indian Stock markets Buzzing Stock publishing house

3. Saha Siddhartha- Indian financial System- and Markets - McGraw hill
4. Websites on Indian Financial markets.

FOOD ADULTERATION

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

Learning Outcomes:

After successful completion of the course, students will be able to:

1. Get basic knowledge on various foods and about adulteration.
2. Understand the adulteration of common foods and their adverse impact on health
3. Comprehend certain skills of detecting adulteration of common foods.
4. Be able to extend their knowledge to other kinds of adulteration, detection and remedies.
5. Know the basic laws and procedures regarding food adulteration and consumer protection.

SYLLABUS:

UNIT-I – Common Foods and Adulteration: (07hrs)

Common Foods subjected to Adulteration - Adulteration – Definition – Types; Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives – Intentional and incidental. General Impact on Human Health.

UNIT-II –: Adulteration of Common Foods and Methods of Detection: (10hrs)

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices and condiments, Processed food, Fruits and vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III –:Present Laws and Procedures on Adulteration: (08hrs)

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India–Rules and Procedures of Local Authorities.

Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives.

Consumer education, Consumer's problems, rights and responsibilities, COPRA 2019 - Offences and Penalties – Procedures to Complain – Compensation to Victims.

Recommended Co-curricular Activities (including Hands on Exercises): (05hrs)

1. Collection of information on adulteration of some common foods from local market
2. Demonstration of Adulteration detection methods for a minimum of 5 common foods (one method each)
3. Invited lecture/training by local expert
4. Visit to a related nearby laboratory
5. Assignments, Group discussion, Quiz etc.

Reference e Books and Websites:

1. A first course in Food Analysis–A.Y.Sathe, New Age International (P) Ltd., 1999
2. Food Safety, case studies–Ramesh.V.Bhat, NIN, 1992
3. https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/Beverages and confectionary.pdf

4. <https://cbseportal.com/project/Download-CBSE-XII-Chemistry-Project-Food-Adulteration#gsc.tab=0> (Downloadable e material on food adulteration)
5. <https://www.fssai.gov.in/>
6. <https://indianlegalsolution.com/laws-on-food-adulteration/>
7. <https://fssai.gov.in/dart/>
8. <https://byjus.com/biology/food-adulteration/>
9. Wikipedia
10. Vikaspedia

INSURANCE PROMOTION

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

Learning Outcomes:

By successful completion of the course, students will be able to;

1. Understand the field level structure and functioning of insurance sector and it's role in protecting the risks
2. Comprehend pertaining skills and their application for promoting insurance coverage
3. Prepare better for the Insurance Agent examination conducted by IRDA
4. Plan 'promoting insurance coverage practice' as one of the career options.

SYLLABUS:

Section I: 06 Hrs

Introduction of Insurance - Types of insurances. Growth of Insurance sector in India - Regulatory mechanism (IRDA) - Its functions

Section II: 10 Hrs

Life Insurance plans. Health insurance plans. Products and features. Contents of documents – Sales Promotion methods - Finding prospective customers – Counselling – Helping customers in filing - Extending post-insurance service to customers.

Section III : 10 Hrs

General Insurance - It's products (Motor, Marine, Machinery, Fire, Travel and Transportation) and features. Contents of documents. Dealing with customers – Explaining Products to Customers - Promoting Customer loyalty. Maintenance of Records.

Co-curricular Activities Suggested: (4 hrs)

1. Collection of pamphlets of various insurance forms and procedures
2. Invited Lectures by Development Officers concerned

3. Mock practice of selling of insurance products
4. Preparation of working documents
5. Assignments, Group discussion, Quiz etc.

Reference books:

1. Principles of Insurance, Himalaya publishing House
2. Principles and Practice of Insurance, "
3. Fundamentals of insurance, "
4. Life and General Insurance Management, "
5. Financial services, Tata McGraw hill
6. Insurance Principles and Practices, Sultan Chand & Sons
7. Websites on insurance promotion

LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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

Learning Outcomes:

At the successful completion of the course, the student will able to;

1. Summarize relationship between marketing and Logistic Management
2. Understand the concepts of Supply Chain Management in connection with products.
3. Understanding various types of seller and suppliers
4. Evaluate best logistic method among all means of transport operations
5. Analysis of different distribution strategies - online and physical distribution
6. Compare the Logistics in National and International Scenario.
7. Design and develop new methods and models of Logistics in SCM

SYLLABUS:

Unit-1: Introduction to Logistics and Supply Chain Management (SCM):

Functions of Logistics - Structure of logistics - Logistics Costs - Modes of Logistics - Logistics in 21st Century -- Role of Supply Chain Management - Design and Development of Supply Chain Network - Different types of Supply Chain Networks

Unit-II: Logistics:

Customer Selection - Process -Customer Service and Customer Retention – Relationship Management - Integrating Logistics and Customer Relationship Management

Unit-III: Supply Chain Management:

Managing and Estimating Supply Chain Demand – Forecasting Techniques – Supplier Networks –Skills to Manage SCM - Recent Trends in SCM

Suggested Co-curricular Activities:

1. Invited lecture from Domain/Industry Experts
2. Field Visit (Manufacturing units, Suppliers)
3. Assignments, Seminars, Group Discussion, Quiz and Role Play
4. Poster presentations on SCM
5. Case Study Development

References:

1. Shailesh Kasande, Materials and logistics Management, NiraliPrakashan
2. Jhamb LC, Materials and logistics Management, Everest Publishing House.
3. Martin Christopher, Logistics & Supply Chain Management, Prentice Hall.
4. Alan Rushton, Phil Croucher & Peter Baker (CILT), Logistics and Distribution Management, Kogan Page Ltd.
5. G. Raghuram , Logics and Supply Chain Management, Macmillan.
6. Dr. Gopal Krishnan – Material Management Rearview, Pearson New Delhi.
7. B.S. Sahay, Macmillan, Supply Chain Management, Pearson Education.
8. Bowersox, Closs & Cooper, Supply Chain Logistics Management, McGraw-Hill.
9. Websites on Logistics and supply chain management.

PERFORMING ARTS

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

Learning Outcomes:

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

1. Acquire the basic knowledge in performing arts
2. Understand the modern stage and performance on the stage
3. Comprehend and improve the skills related to performing arts on the stage
4. Understand various Telugu folk arts and their significance
5. Know the modes of presentation and skills pertaining to folk arts.

SYLLABUS:**Unit-I: Introduction to performing Arts 06 Hrs**

Arts – and its definition; Fine Arts; Arts - Learning & Imitation – Rasaas, Bhaavas and Rasa Sutra. Dasaroopakaas; Nritha, Nrithya, Natya; Action – Kinds of Actions; Ancient Costume style

Unit-II: Performing Arts – Stage Arts 10 Hrs

Origin of Drama (Theatre); Features of Stage; Varieties of Modern Telugu Drama; Famous Telugu Dramas.

Stage performance; Dramatic Actor and its definition; Actor–characteristics, Functions and Responsibilities.

Traits of an Actor – Diction, Articulation, Dialogue modulation, Time sense, Observation, Mime, Improvisation, Commentary,

Dress code, Make-up, lighting & Stage Direction.

Unit-III: Performing Arts – Forms 10 Hrs

Folk Arts, their nature and significance – Brief introduction to Pagaveshalu, Bommalaatalu, Veedhinaatakaalu, Yakshagaanaalu, Harikathalu, Burrakathalu, Oggukathalu, Chindu, Yakshaganam, Kolaatam and Pulivesham.

Co-curricular Activities Suggested: (4 hrs) 3

1. Collection of information on modern stage plays, natakasamajams and audio visual material.
2. Providing training classes/inviting lectures with the help of local artists
3. Visit to a real time performing folk arts, if possible.
4. Mock experience classes of Stage plays and Folk arts.
5. Assignments, Group discussion, Quiz etc.

References:

1. Andhra Naataka Ranga Charithra –Mikkilineni Radha Krishna Murthy
2. Telugu Sahithya Sameeksha (Vol-II) – Dr. G. Nagaiah
3. Telugu Naataka Vilaasam – Dr. P.S.Rappa Rao
4. Telugu Jaanapada Vignanam – Prof. Tangirala Venkata Subba Rao
5. Jaanapada Vignandhyayanam – Prof. G.S. Mohan
6. Naatya Sasthramu (Visleshanathmak Adhyayanam) – Dr. P.S.Rappa Rao
7. Sahithya Silpa Sameeksha – Prof. Pingali Lakshmikantham
8. Nurella Telugu Nataka Rangam – Prof. Modali Nagabhushana Sarma
9. Websites on Performing Arts.

PUBLIC RELATIONS

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

Course Outcomes:

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

1. Understand the historical background and role Public Relations in various areas
2. Have insight into the use of the technological advancements in Public Relations
3. Comprehend tools of Public Relations in order to develop the required skills.
4. Understand the ethical aspects and future of Public Relations in India
5. Develop writing skills for news papers and creation of Blogs.

Syllabus:	Unit	Public Relations-Meaning, Definition, Nature and Scope, Historical
I		Background, Technological and Media Revolution and Role in Business,
06 Hrs		Government, Politics, NGOs and Industry.
Unit II		Concepts of Public Relations-Press, Publicity, Lobbying, Propaganda,
10 Hrs		Advertising, Sales Promotion and Corporate Marketing Services, Tools
		of Public Relations-Press Conferences, Meets, Press Releases,
		Announcements, Webcasts
Unit III		Public Relations and Mass Media, Present and future of Public Relations
10 Hrs		in India, Ethics of Public Relations and Social Responsibility, Public
		Relations and Writing-Printed Literature, Newsletters, Opinion papers
		and Blogs

Co-curricular Activities Suggested: (04 Hrs)

1. Invited lecture by local field expert/eminant personality on Public Relations
2. Visit to Press

3. Opinion Survey, Media Survey and Feedback
4. Case Studies
5. Organising mock press conferences, exhibitions
6. Assignments, Group discussion, Quiz etc.

Reference Books:

1. Brown, Rob, Public Relations and the Social Web, Kogan Page India, New Delhi, 2010.
2. Cutlipscottetal, Effective Public Relations, London, 1995.
3. Black Sam, Practical Public Relations, Universal Publishers, 1994.
4. S.M.Sardana, Public Relations: Theory and Practice.
5. J.V.Vilanilam, Public Relations in India: New Tasks and Responsibilities, SAGE Publications India Pvt Ltd, New Delhi2011.
6. Websites on Public relations.

SURVEY & REPORTING

Total Hours : 30 (2h/w), Credits : 02, Max Marks: 50.

Learning Outcomes:

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

1. Understand the basics of survey and reporting needs and methods
2. Comprehend designing of a questionnaire
3. Conduct a simple and valid survey and Collect data
4. Organize and interpret data and Prepare and submit report.

Syllabus: Unit I

08Hrs

Survey: Meaning and Definition –Identifying need for survey - Identifying Sample –Characteristics of Sample - Types of Survey – Survey Methods – Advantages and Disadvantages of Survey – Essential Steps in Survey – Online Survey.

Unit II

09Hrs

Preparing Questionnaire: Types and Parts of Questionnaire – Qualities of good Questionnaire – Precautions inPreparing Questionnaire

Administering/Piloting Questionnaire –Collection of data -Dealing with People – Maintaining objectivity/neutrality.

Unit III

10Hrs

Methods of Organizing data – Forms of data presentation - Tables and Figures – Basic Statistical Methods of Analysis of data – Percentages - Mean, Mode and Median –Simple Ways of showing Results– Tables/Graphs/Diagrams

Report Writing: Forms of Reporting - Parts of a Report - Title page to Acknowledgements -Characteristics of a Good Report – Style of language to be used - Explaining Data in the Report – Writing fact-based Conclusions – making Recommendations – Annexing required material.

Recommended Co-curricular Activities (03 hrs):

1. Invited Lecture/Training by a Local Expert

2. Collection and study of questionnaires
3. Preparation of sample questionnaire and conduct a live sample survey
4. Preparation of a sample Report
5. Assisting a real time field survey and report writing
6. Assignments, Group discussion, Quiz etc.

References:

1. Denscombe M., The Good Research Guide: For Small-Scale Social Research Projects, Open Uni. Press, 1998
2. Sudman S & Bradburn N.M., Asking Questions, 1973
3. Wayne W Daniel, Questionnaire Design, 1979
4. Websites on Survey and Reporting.

PLANT NURSERY

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

Learning Outcomes :

On successful completion of this course students will be able to;

1. *Understand the importance of a plant nursery and basic infrastructure to establish it.*
2. *Explain the basic material, tools and techniques required for nursery.*
3. *Demonstrate expertise related to various practices in a nursery.*
4. *Comprehend knowledge and skills to get an employment or to become an entrepreneur in plant nursery sector.*

Syllabus:

Unit-1 :Introduction to plant nursery 06 Hrs.

1. Plant nursery: Definition, importance.
2. Different types of nurseries –on the basis of duration, plants produced, structure used.
3. Basic facilities for a nursery; layout and components of a good nursery.
4. Plant propagation structures in brief.
5. Bureau of Indian Standards (BIS-2008) related to nursery.

Unit- 2 :Necessities for nursery 09 Hrs.

1. Nursery beds – types and precautions to be taken during preparation.
2. Growing media, nursery tools and implements, and containers for plant nursery, in brief.
3. Seeds and other vegetative material used to raise nursery in brief.
4. Outlines of vegetative propagation techniques to produce planting material.
5. Sowing methods of seeds and planting material.

Unit-3 :Management of nursery 09 Hrs.

1. Seasonal activities and routine operations in a nursery.
2. Nursery management – watering, weeding and nutrients; pests and diseases.
3. Common possible errors in nursery activities.
4. Economics of nursery development, pricing and record maintenance.
5. Online nursery information and sales systems.

Suggested Co-curricular activities (6 Hrs.)

1. Assignments/Group discussion/Quiz/Model Exam.
2. Demonstration of nursery bed making.
3. Demonstration of preparation of media for nursery.
4. Hands on training on vegetative propagation techniques.
5. Hands on training on sowing methods of seeds and other material.
6. Invited lecture cum demonstration by local expert.
7. Watching videos on routine practices in plant nurseries.
8. Visit to an agriculture/horticulture /forest nursery.
9. Case study on establishment and success of a plant nursery.

Suggested text books/reference books :

1. Ratha Krishnan, M., et.al. (2014) *Plant nursery management : Principles and practices*, Central Arid Zone Research Institute (ICAR), Jodhpur, Rajasthan
2. Kumar, N., (1997) *Introduction to Horticulture*, Rajalakshmi Publications, Nagercoil.
3. Kumar Mishra, K., N.K. Mishra and Satish Chand (1994) *Plant Propagation*, John Wiley & Sons, New Jersey.

BUSINESS COMMUNICATION

Total 30 hrs (02hrs/wk), 02 Credits, Max 50 marks

Learning Outcomes:

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

1. Understand the types of business communication and correspondence
2. Comprehend the processes like receiving, filing and replying
3. Acquire knowledge in preparing good business communications
4. Acquaint with organizational communication requirements and presentations.

SYLLABUS:

UNIT I : 06hrs

Introduction and Importance of communication an overview - meaning and process of communication - organizational communication and its barriers.

UNIT II: 10hrs

Types of Business Communications –Categories, methods and formats - Business vocabulary - Business idioms and collocations – Organisational Hierarchy - Various levels of communication in an organization – Top-down, Bottom-up and Horizontal-Business reports, presentations– Online communications.

UNIT III: 10hrs

Receiving business communications -Filing and processing -Sending replies. Routine cycle of communications – Writing Communications - Characteristics of a good business communication -Preparation of business meeting agenda – agenda notes - minutes – circulation of minutes –Presentations of communication using various methods.

Recommended Co-curricular Activities (04hrs):

1. Collection of various model business letters
2. Invited lecture/field level training by a local expert
3. Reading of various business reports and minutes and its analysis
4. Presentations of reports, charts etc.
5. Assignments, Group discussion, field visit etc.

Reference books:

1. Chaturvedi. P.D.Chaturvedi.M - Business Communication concepts, Cases and applications - Pearsons Education
2. Kaul Asha - Effective Business Communication - PHI Learning pvt Ltd
3. www.swayam.gov.in
4. Websites on business communication

FRUITS AND VEGETABLES PRESERVATION

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

Learning Outcomes:

On successful completion of this course the students will be able to;

1. *Identify various types of fruits and vegetables and explain their nutritive value.*
2. *Understand the fragile nature of fruits and vegetables and causes for their damage.*
3. *Explain various methods of preservation for fresh fruits and vegetables.*
4. *Get to know the value-added products made from fruits and vegetables.*

Syllabus:

Unit – 1 : Introduction to fruits and vegetables 06 Hrs.

1. Fruits: Definition, elementary knowledge on types of fruits (fleshy and dry) with local /common examples.
2. Vegetables: Definition, elementary knowledge on types of vegetables (root, leafy, stem, flower and fruit) with local/ common examples.
3. Importance of fruits and vegetables in human nutrition.
4. Concept of perishable plant products – maturation and spoilage, shelf life; preservation – definition and need for preservation of fruits and vegetables.

Unit – 2 :Preservation of Fruit 09 Hrs.

1. Fruits – ripening and biological aging; storage and preservation concerns.
2. Preservation of fresh fruits at room temperature and in cold storage.
3. Fruit preservation at room temperature as juices, squashes and syrups.
4. Preservation of fruits by application of heat; making of fruit products (jams, jellies and fruit slices in processing factories).
5. Preservation by dehydration (Eg. banana chips), application of sugar (Eg. mango candy), application of salt (pickling).
6. Fruit preservation by freezing – storage at the lowest temperatures.

Unit – 3 :Preservation of vegetables 09 Hrs.

1. Vegetables – losses after harvesting and causes; problems in handling and storage.
2. Modern methods of packaging and storage to reduce losses.
3. Trimming of vegetables and packing in cartons; dehydration technique -factory processing.
4. Making of vegetable products (flakes/chips of potato and onion; garlic powder).
5. Frozen vegetables – Carrots, Cauliflower, Okra and Spinach.
6. Preservation of sliced vegetables in factories by canning and bottling.
- 7.

Suggested Co-curricular activities (6 Hrs.)

1. Assignments/Group discussion/Quiz/Model Exam.
2. Invited lecture and demonstration by local expert
3. Exhibition of various types of locally available fruits and vegetables.
4. Hands on training on handling and packaging methods of fresh fruits and vegetables.
5. Hands on training on making fruit juices.
6. Display of various preserved fruit products available in local markets.
7. Hands on training on making of potato, yam, onion chips.
8. Display of various preserved vegetable products available in local markets.
9. Watching videos on preservation of fruits and vegetables.
10. Visit to Horticulture University or research station to learn about value added products of fruits and vegetables.

Suggested text books/reference books :

1. Giridharilal, G. S. Siddappa and G.L.Tandon(2007) *Preservation of Fruits and Vegetables*, Indian Council of Agri. Res., New Delhi
2. Srivastava, R.P., and Sanjeev Kumar (2019) *Fruit and Vegetable Preservation : Principles and Practices*, CBS Publishers & Distributors Pvt., Ltd., New Delhi
3. Thompson, A.K. (1995) *Post Harvest Technology of Fruits and Vegetables*. Blackwell Sci.,U.K.
4. Verma, L.R. and V.K. Joshi (2000) *Post Harvest Technology of Fruits and Vegetables*. Indus Publ., New Delhi

SOLAR ENERGY

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

Learning Outcomes:

After successful completion of the course, students will be able to:

1. *Acquire knowledge on solar radiation principles with respect to solar energy estimation.*
2. *Get familiarized with various collecting techniques of solar energy and its storage*
3. *Learn the solar photovoltaic technology principles and different types of solar cells for energy conversion and different photovoltaic applications.*

4. Understand the working principles of several solar appliances like Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses

SYLLABUS:

UNIT-I – Solar Radiation: (6 hrs)

Sun as a source of energy, Solar radiation, Solar radiation at the Earth's surface, Measurement of Solar radiation-Pyroheliometer, Pyranometer, Sunshine recorder, Prediction of available solar radiation, Solar energy-Importance, Storage of solar energy, Solar pond

UNIT-II – Solar Thermal Systems: (10 hrs)

Principle of conversion of solar radiation into heat, Collectors used for solar thermal conversion: Flat plate collectors and Concentrating collectors, Solar Thermal Power Plant, Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses.

UNIT-III – Solar Photovoltaic Systems: (10 hrs)

Conversion of Solar energy into Electricity - Photovoltaic Effect, Solar photovoltaic cell and its working principle, Different types of Solar cells, Series and parallel connections, Photovoltaic applications: Battery chargers, domestic lighting, street lighting and water pumping

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]

1. Plot sun chart and locate the sun at your location for a given time of the day.
2. Analyse shadow effect on incident solar radiation and find out contributors.
3. Connect solar panels in series & parallel and measure voltage and current.
4. Measure intensity of solar radiation using Pyranometer and radiometers.
5. Construct a solar lantern using Solar PV panel (15W)
6. Assemble solar cooker
7. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power
8. Assignments/Model Exam.

Reference Books:

1. Solar Energy Utilization, G. D. Rai, Khanna Publishers
1. Solar Energy- Fundamentals, design, modeling & applications, G.N. Tiwari, Narosa Pub., 2005.
2. Solar Energy-Principles of thermal energy collection & storage, S.P. Sukhatme, Tata Mc-Graw Hill Publishers, 1999.
3. Solar Photovoltaics- Fundamentals, technologies and applications, Chetan Singh Solanki, PHI Learning Pvt. Ltd.,
4. Science and Technology of Photovoltaics, P. Jayarama Reddy, BS Publications, 2004.

RETAILING

Total 30hrs (02hrs/wk) 02 credits & Maximum 50 Marks

Learning Outcomes:

After successful completion of this course, the students are able to;

1. Know the retailing business, its growth in India and social impact
2. Understand the organization and supply in retailing
3. Comprehend the opportunities and challenges in retailing
4. Learn the functions that support outlet operations, sales and services
5. Create a shopping experience model that builds customer loyalty and business promotion

SYLLABUS:**Unit I: 06hrs**

Introduction -Retailing - Definition– Role of Retailing- Types of Retailing – Factors influencing the Growth of Retailing in India.

Unit II: 10 hrs

Store location – factors influencing selection of location - Types of retail outlets - stores design & operations- Merchandise planning - Administrative mechanism

Unit III: 10hrs

Human resources in retailing - Job profile- Services to customers – Customer care - Communications with customers - Visual merchandising – enhancing customer loyalty and Sales promotion.

Recommended Co-curricular Activities (04 hrs):

1. Collection of information on local retailing
2. Invited lecture/skills training by a local expert
3. Visit near-by stores /Godowns/warehouses and prepare study projects
4. Field training during leisure hours
5. Assignments, Group discussion, Sharing of experience etc.

Reference books:

1. Swapna pradhan.R.M - Retail Management - Tata Mc Graw Hill

2. Berman, Barry & Evans - Retailing Management- A strategic Approach - Pearson Publications
3. Lamba.A.J. - The Art of Retailing - Tata McGraw Hill Publications
4. Websites on Retailing.

ENVIRONMENTAL AUDIT

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

Learning Outcomes:

By successful completion of the course, students will be able to;

1. *Understand the basic concepts Environmental health*
2. *Learn and identify the industrial pollution*
3. *Explain the highlights in the regulatory aspects of Environmental law and policy*
4. *Understand the various phases of Environmental Audit*

UNIT – I

Industrial Pollution and its effects 06h

Climate – Weather and Air Pollution – Classification of water and water bodies – Water Quality Parameters – Water Pollution – Sources – Classification, nature and Toxicology of water pollutants. - Soil parameters – Soil pollution and impacts – Soil conservation

UNIT - II

Environmental Law & Policy: 09h

Highlights of the Acts, Institutional arrangements for: (1) The Water (Prevention & Control of Pollution) Act, 1974 amended in 1988; (2) The Air (Prevention and Control of Pollution) Act, 1981 amended in 1987; (3) The Water (Prevention and Control of Pollution) Cess Act, 1977 amended in 1991; (4) The Environment (Protection) Act, 1986; (5) The Public Liability Insurance Act, 1991; – Indian Policy Statement for abatement of Pollution, 1992.

UNIT - III

Environmental Audit - Scope & Requisites: 10h

Environmental Audit: Definition; Objectives; Scope, Coverage - GOI Notification on Environmental Audit - Benefits to Industry. Reporting Environmental Audit Findings - Importance of Environmental Audit Report to industry, public and the governments.

Co-curricular Activities Suggested: 05h

1. Visit to understand Institutional arrangements and functioning of Pollution Control Boards.
2. Visiting different Ecosystems
3. **Soil analysis:** Determination of soil type and texture, pH, Soil Moisture, Nitrogen, Potassium and Phosphorous.
4. **Water analysis:** Determination of pH, Dissolved solids and suspended solids, Dissolved Oxygen, COD, BOD.
5. Assignments, Group discussion, Quiz etc.

Reference books and websites:

1. Environmental Education in India by K.R. Gupta
2. Environmental Legislation in India by K.R. Gupta
3. <https://parivesh.nic.in/>
4. <https://www.cpcb.nic.in/>
5. <https://www.free-ebooks.net/environmental-studies-academic>

POULTRY FARMING

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

Learning Outcomes:

By successful completion of the course, students will be able to;

1. Understand the field level structure and functioning of insurance sector and its role in protecting the risks
2. Comprehend pertaining skills and their application for promoting insurance coverage
3. Prepare better for the Insurance Agent examination conducted by IRDA
4. Plan 'promoting insurance coverage practice' as one of the career options.

SYLLABUS:**Section I (Introduction to Poultry Farming): 10Hrs**

- 1.1 General introduction to poultry farming -Definition of Poultry; Past and present scenario of poultry industry in India.
- 1.2 Principles of poultry housing. Poultry houses. Systems of poultry farming.
- 1.3 Management of chicks, growers and layers. Management of Broilers.
- 1.4 Preparation of project report for banking and insurance

Section II (Feed and Livestock Health Management): 10 Hrs

- 2.1 Poultry feed management – Principles of feeding, Nutrient requirements for different stages of layers and broilers. Feed formulation and Methods of feeding.
- 2.2 Poultry diseases – viral, bacterial, fungal and parasitic(two each); symptoms, control and management; Vaccination programme.

Section III (Harvesting of Eggs and Sanitation): 10 Hrs

- 3.1 Selection, care and handling of hatching eggs. Egg testing. Methods of hatching.
- 3.2 Brooding and rearing. Sexing of chicks.
- 3.3 Farm and Water Hygiene, Recycling of poultry waste.

Co-curricular Activities Suggested: (4 hrs)

1. Group discussion & SWOT analysis
2. Visit to a poultry farm
3. Invited Lectures by Concerned officers of government or private farms
4. Cheap and Healthy Feed preparation by students based on government standards
5. Market study and Survey (Monitoring of daily price hike in poultry market and analysis)
6. Online SwayamMoocs course on poultry farming (see reference 9 below)

Reference books:

1. Sreenivasaiah., P. V., 2015. Textbook of Poultry Science. 1st Edition. Write & Print Publications, New Delhi
2. Jull A. Morley, 2007. Successful Poultry Management. 2nd Edition. Biotech Books, New Delhi"
3. Hurd M. Louis, 2003. Modern Poultry Farming. 1st Edition. International Book Distributing Company, Lucknow."
4. Life and General Insurance Management, "
5. Financial services, Tata McGraw hill
6. <http://www.asci-india.com/BooksPDF/Small%20Poultry%20Farmer.pdf>
7. https://nsdcindia.org/sites/default/files/MC_AGR-Q4306_Small-poultry-farmer-.pdf
8. <http://ecoursesonline.iasri.res.in/course/view.php?id=335>
9. https://swayam.gov.in/nd2_nou19_ag09/preview



GOVT. COLLEGE FOR MEN (AUTONOMOUS) :: KADAPA

Re accredited by NAAC at B Grade

LIFE SKILL COURSES

NAME OF THE COURSE	CODE
Human Values and Professional Ethics	1015
Indian Culture And Science	2017
Information And Communication Technology	2016
Elementary Statistics	2015
Environmental Education	3015
Personality Development And Leadership	3016
Health And Hygiene	3017
Analytical Skills	3018

LIFE SKILL COURSES

HUMAN VALUES AND PROFESSIONAL ETHICS

INDIAN CULTURE AND SCIENCE

INFORMATION AND COMMUNICATION TECHNOLOGY

ELEMENTARY STATISTICS

ENVIRONMENTAL EDUCATION

PERSONALITY DEVELOPMENT AND LEADERSHIP

HEALTH AND HYGIENE

ANALYTICAL SKILLS

HUMAN VALUES AND PROFESSIONAL ETHICS (HVPE)

Learning Outcome:

On completion of this course, the UG students will be able to

- ✓ Understand the significance of value inputs in a classroom and start applying them in their life and profession
- ✓ Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
- ✓ Understand the value of harmonious relationship based on trust and respect in their life and profession
- ✓ Understand the role of a human being in ensuring harmony in society and nature.
- ✓ Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

UNIT: 1 Introduction – Definition, Importance, Process & Classifications of Value Education

- ❖ Understanding the need, basic guidelines, content and process for Value Education
- ❖ Understanding the thought provoking issues; need for Values in our daily life
- ❖ Choices making – Choosing, Cherishing & Acting
- ❖ Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

UNIT: 2 Harmony in the Family – Understanding Values in Human Relationships

- ✓ Understanding harmony in the Family- the basic unit of human interaction
- ✓ Understanding the set of proposals to verify the Harmony in the Family;
- ✓ Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- ✓ Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.
- ✓ Understanding the Problems faced due to differentiation in Relationships
- ✓ Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals
- ✓ Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha*)- from family to world family.

UNIT: 3 Professional Ethics in Education

- ✓ Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.
- ✓ Understanding the concepts; Positive co-operation, Respecting the competence of other professions.
- ✓ Understanding about Taking initiative and Promoting the culture of openness.
- ✓ Depicting Loyalty towards Goals and objectives.

Text Books:

R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.

Bhatia, R. & Bhatia, A (2015) Role of Ethical Values in Indian Higher Education.

References:

- Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, U
- E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
- Susan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
- A Nagraj, 1998, Jeevan Vidya EkParichay, Divya Path Sansthan, Amarkantak.
- P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- A N Tripathy, 2003, Human Values, New Age International Publishers.

Mode of Evaluation:

Assignment/ Seminar/Continuous Assessment Test/Semester End Exam.

Co curricular Activities:

1. Visit to an Old Age Home and spending with the inmates for a day.
2. Conduct of Group Discussions on the topics related to the syllabus.
3. Participation in community service activities.
4. Working with a NGO like Rotary Club or Lions International, etc.

INDIAN CULTURE & SCIENCE

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

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Understand the evolution of India's culture
2. Analyze the process of modernization of Indian society and culture from past to future
3. Comprehend objective education and evaluate scientific development of India in various spheres
4. Inculcate nationalist and moral fervor and scientific temper

Syllabus:**Unit – I: Unity in Diversity in India: (09 hrs)**

Coexistence of various religions since ancient times - Hinduism, Buddhism, Jainism and Atheism, and later Sikhism, Islam and Christianity

The Bhakti (Vishnavite and Saivaite) and Sufi Movements

The concepts of seela, karuna, kshama, maitri, vinaya, santhi and ahimsa Achievements in Literature, Music, Dance, Sculpture and Painting - Craftsmanship in cloth, wood, clay, metal and ornaments

Cultural diversity, Monogamy, Family system, Important seasonal festivals

Unit – II: Social Reforms and Modern Society: (09 hrs)

Reforms by Basaveswara - Raja Rama Mohan Roy – Dayananda Saraswathi –Swamy Vivekananda –Mahatma Gandhi - B. R. Ambedkar - Reforms in Andhra by Vemana,Veerabrahmam, Gurajada, Veeresalingam and GurramJashua (only reforms in brief, biographies not needed)

Modern Society: Family unity, Community service, Social Harmony, Civic Sense, Gender Sensitivity, Equality, National Fervor

Unit – III: Science and Technology: ((09 hrs)

Objectivity and Scientific Temper – Education on Scientific lines (Bloom's Taxonomy) - Online Education

Developments in Industry, Agriculture, Medicine, Space, Alternate Energy, Communications, Media through ages

Co-curricular Activities Suggested: (03 hrs)

1. Assignments, Group discussions, Quiz etc
2. Invited Lecture by a local expert
3. Visit to a scientific institutions, local heritage sites, museums, industries etc

Reference Books:

1. History of India and Culture (Upto 1526 A.D), Telugu Academy
2. History of India and Culture (1526 A.D to 1964), Telugu Academy
3. Basham, A.L (ed), A Cultural History of India
4. Hana S. Noor Al-Deen&J.A.Hendricks, Social Media : Usage and Impact
5. Bipan Chandra, Aditya Mukherjee, Mridula Mukherjee, India After Independence
6. S.K.Thakur, ISRO: History and Achievements
7. V. Ramakrishna, Social Reform Movement Andhra, Vikas Publications

INFORMATION & COMMUNICATION TECHNOLOGY**Objectives:**

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes:After completion of the course, student will be able to;

1. Understand the literature of social networks and their properties.
2. Explain which network is suitable for whom.
3. Develop skills to use various social networking sites like twitter, flickr, etc.
4. Learn few GOI digital initiatives in higher education.
5. Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
6. Get acquainted with internet threats and security mechanisms.

SYLLABUS:**UNIT-I:** (08 hrs)

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser – Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II: (08 hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III:(10 hrs)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-acharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

1. Assignments(in writing and doing forms on the aspects of syllabus content and

outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

1. Quiz and Group Discussion

3. Slip Test

4. Try to solve MCQ's available online.

5. Suggested student hands on activities :

a. Create your accounts for the above social networking sites and explore them, establish a video conference using Skype.

b. Create an Email account for yourself- Send an email with two attachments to another friend. Group the email addresses use address folder.

c. Register for one online course through any of the online learning platforms like NPTEL, SWAYAM, Alison, Codecademy, Coursera. Create a registration form for your college campus placement through Google forms.

Reference Books :

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – by Raymond Greenlaw and Ellen Hepp, Publishers : TMH

2. Internet technology and Web design, ISRD group, TMH.

3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

ELEMENTARY STATISTICS

Objective: To provide basic understating of general statistical tools and their elementary applications and to create awareness on Indian Statistical System.

Learning outcomes

Unit-I: To understand the concept of Statistics and its merits and demerits. Distinguishing primary and secondary data. Classification, Tabulation and Pictorial representation of data.

Unit - II: To understand the basic nature of data and how a single value describes the entire data set.Measuring the degree of departure of a distribution from symmetry and reveals the direction of scatterdness of the items.

Unit - III: To understand the spread of the data and to draw conclusions from the comparison

of averages.

To understand the concept of correlation and regression and to learn the degree of association between two variables and establishing relationship between the variables.

Unit I: Meaning, scope and limitations of Statistics

Collection of data: Primary and Secondary, Classification and Tabulation, Construction of frequency distribution.

Graphical Representation: Histogram, Bar, Pie and Frequency polygon. (8hrs)

Unit II: *Measures of Central Tendency:* Features of good average, Arithmetic Mean, Median, Mode. Empirical relationship between Mean Median and Mode and skewness based on central values. (8hrs)

Unit III: *Measures of Dispersion:* Range, Quartile Deviation(QD), Mean Deviation(MD), Variance, Standard Deviation(SD), relationship between QD, MD and SD. Familiarization of the concepts relating to Correlation and Linear Regression line. (8hrs)

Books for Study:

1. Statistics (Theory, Methods, Application) D C Sancheti, V K Kapoor, Sultan Chand and Sons, New Delhi
2. Statistical Methods, S.P. Gupta, Sultan Chand and Sons, New Delhi
3. Statistics (Theory and Practice) B.N Gupta, Sahitya Bhavan, Agra

Web sites for free download books for Statistics

<https://www.pdfdrive.com/introduction-to-statistics-books.html>

<http://www.freebookcentre.net/SpecialCat/Free-Statistics-Books-Download.html>

<https://bookboon.com/en/statistics-ebooks>

http://onlinestatbook.com/Online_Statistics_Education.pdf

ENVIRONMENTAL EDUCATION

(Total hours of Teaching – 30 Hrs. @ 02 Hrs. per Week)

Course objective: A Generic Course intended to create awareness that the life of human beings is an integral part of environment and to inculcate the skills required to protect environment from all sides.

Learning outcomes: On completion of this course the students will be able to

1. Understand the nature, components of an ecosystem and that humans are an integral part of nature.
2. Realize the importance of environment, the goods and services of a healthy biodiversity, dependence of humans on environment.
3. Evaluate the ways and ill effects of destruction of environment, population explosion on ecosystems and global problems consequent to anthropogenic activities.
4. Discuss the laws/ acts made by government to prevent pollution, to protect biodiversity and environment as a whole.
5. Acquaint with international agreements and national movements, and realize citizen's role in protecting environment and nature.

Unit 1: Environment and Natural Resources 06 Hrs.

1. Multidisciplinary nature of environmental education; scope and importance, need for public awareness
2. Structure and composition of Atmosphere, Hydrosphere, Lithosphere and Biosphere
3. Man as an integral product and part of the Nature.
4. A brief account of land, forest and water resources in India and their importance.

5. Biodiversity : Definition; importance of Biodiversity , Levels of Biodiversity, genetic, species and ecosystem diversity.

Unit-2: Environmental degradation and impacts 10Hrs

1. Human population growth and its impacts on environment; land use change, land degradation, soil erosion and desertification.

2. Use and over-exploitation of surface and ground water, construction of dams, floods, conflicts over water (within India).

3. Deforestation: Causes and effects due to expansion of agriculture, firewood, mining, forest fires and building of new habitats.

4. Non-renewable and renewable energy resources and their utilization.

5. A brief account of air, water, soil and noise pollutions; Biological, industrial and solid wastes in urban areas. Human health and economic risks.

6. Green house effect - global warming; ocean acidification, ozone layer depletion, acid rains and impacts on living organisms, agriculture and health.

7. Threats to biodiversity: Natural calamities, habitat destruction and fragmentation, over exploitation, hunting and poaching, introduction of exotic species, pollution, predator and pest control.

Unit 3: Conservation of Environment 10 Hrs

1. Concept of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation.

2. Control measures for various types of pollution; use of renewable and alternate sources of energy.

3. Solid waste management: Control measures of urban and industrial waste.

4. Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

5. Environment Laws: Environment Protection Act; Act; Wildlife Protection Act; Forest Conservation Act.

6. International agreements: Montreal and Kyoto protocols; Environmental movements: Bishnois of Rajasthan, Chipko, Silent valley.

1. Visit to an area to document environmental assets: river/ forest/ flora/fauna/botanical garden, etc
2. Visit to a local polluted site-Urban/Rural/Industrial/Agricultural site.
3. Study of common plants, insects, birds and basic principles of identification.
4. Study of simple ecosystems□forest, tank, pond, lake,mangroves etc.
5. Case study of a Forest ecosystem or a pond ecosystem.
6. Environmental issues and ethics

Suggested activities to learner: (4 hours)

Suggested text book :

- ErachBarucha (2004) *Text book of Environmental Studies for Undergraduate courses*

(Prepared for University Grants Commmission) Universities Press.

- PurnimaSmarath (2018) *Environmental studies* Kalyani Publishers, Ludhiana

Reference books :

- Odum, E.P., Odum, H.T. & Andrews, J. (1971) *Fundamentals of Ecology*. Philadelphia: Saunders.
- Pepper, I.L., Gerba, C.P. &Brusseau, M.L. (2011). *Environmental and Pollution Science*. Academic Press.
- Raven, P.H., Hassenzahl, D.M. & Berg, L.R. (2012) *Environment. 8th edition*. John Wiley & Sons.
- Singh, J.S., Singh, S.P. and Gupta, S.R. (2014) *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
- Sengupta, R. (2003) *Ecology and economics: An approach to sustainable development*. OUP.
- Wilson, E. O. (2006) *The Creation: An appeal to save life on earth*. New York: Norton.
- Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll (2006) *Principles of Conservation Biology*. Sunderland: Sinauer Associates,

PERSONALITY ENHANCEMENT & LEADERSHIP

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

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Develop comprehensive understanding of personality
2. Know how to assess and enhance one's own personality
3. Comprehend leadership qualities and their importance
4. Understand how to develop leadership qualities

Syllabus:**Unit – I:**(7 hrs)

Meaning of Personality – Explanations of Human Personality – Psychodynamic Explanations – Social Cognitive Explanation – Big Five traits of Personality

Unit – II: (8 hrs)

Assessment of Personality - Projective& Self Report Techniques - Building Self- Confidence – Enhancing Personality Skills

Unit – III:(10 hrs)

Leadership Characteristics – Types of Leaders – Importance of Leadership – Leadership Skills – Building and Leading Efficient Teams – Leadership Qualities of Abraham Lincoln, mahatma Gandhi, Prakasam Pantulu, Dr. B. R. Ambedkar & J.R.D.Tata

Co-curricular Activities Suggested: (05 hrs)

1. Assignments, Group discussions, Quiz etc
2. Invited Lecture by a local expert
3. Case Studies (ex., on students behavior, local leaders etc.)

Reference Books:

- Girish Batra, Experiments in Leadership, Chennai: Notion Press, 2018
- Mitesh Khatri, Awaken the Leader in You, Mumbai: Jaico Publishing House, 2013
- Carnegie Dale, Become an Effective Leader, New Delhi: Amaryllis, 2012
- Hall, C.S., Lindzey. G. & Campbell, J.B Theories of Personality. John Wiley & Sons, 1998

HEALTH & HYGIENE

(Total teaching hours – 30 Hrs. @ 02 Hrs. per Week)

The course is designed to provide a complete guidance on health and hygiene systems, guidelines for implementing and role of government and public in maintaining a healthy life. At the end of the course the student shall be able to understand –

- the importance of health and hygiene in life
- the importance of nutrition for a healthy life
- different health care programmes of India
- basic concept of health impact assessment as a means of assessing the policies, plans and projects using quantitative and qualitative techniques
- importance of community and personal health & hygiene measures
- Importance of food, social tenets, mental condition, physical activity on health

Learning Objectives:

- To provide knowledge on different health indicators and types of hygiene methods
- To impart knowledge on different health care programmes taken up by India

- To make student understand the latest concepts of health such as HIA, EIA, SIA and SEA
- To enable student with disaster mitigation strategies
- To create awareness on community health and hygiene
- To enrich knowledge on communicable and non-communicable diseases and their control
- To aware the student on the importance of food, social strategies, mental status and physical activities on health
- To introduce different community-based mobile apps on health to student and thereby to the community

Learning / Course Outcomes: On completion of this course, the students will be able to understand -

- What is a healthy diet
- How can we use available information to optimize our diet?
- Can nutrition be used for a healthy life?
- Is there a one-size-fits-all “good” diet or should we individualize our dietary goals?
- Disaster management and responsiveness of public in pandemic and epidemic diseases
- Assess the impact of policies on health and hygiene Health measures to consider while travelling
- Awareness in public through digital media viz., mobile apps

ANALYTICAL SKILLS

Total 30 Hrs

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

Course Outcomes:

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

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

UNIT – 1: (10 Hours)

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – 2: (10 Hours)

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance – speed.

Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT – 3: (07 Hours)

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

Recommended Co-Curricular Activities (03 hrs)

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

Text Book:

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

Reference Books

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar,

New Delhi-110055

2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
3. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw Hill Publications.