

M.V.S. GOVT. ARTS & SCIENCE COLLEGE

(AUTONOMOUS)

MAHABUBANGAR TELANGANA STATE
(NAAC with B Grade, ISO 9001:2015)

FACULTY OF COMMERCE

Offering Programmes

- ❖ **B.COM (GENERAL)**
- ❖ **B.COM (COMPUTER APPLICATIONS)**
- ❖ **B.B.A /BBM**

BACHOLOR OF COMMERCE (GENERAL& COMPUTER APPLICATIONS)

PROGRAMME OUTCOME (POs)

PO – 1: After completing three years for Bachelors in Commerce (General & Computer applications) program, students would gain a through grounding in the fundamentals of Commerce, Business Economics, Finance, Accounting, Business environment, Business and commercial Laws, Company laws, Business Data Analysis and interpretation.

PO – 2: The commerce and Accounting focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in Trade, commerce and business.

PO -3: The all-inclusive outlook of the course offer a number of value added and job oriented/skill oriented and entrepreneurial abilities oriented courses ensures that students are trained into up-to-date. In advanced accounting courses beyond the introductory level, affective development will also progress to the valuing and organization levels.

PO -4: outlook of all the issues related to Global business environment and practices with add on courses. Certificate courses with various skills required advanced skills related to business studies.

B.COM (GENERAL) PROGRAMME SPECIFIC OUTCOME (PSO)

PSO – 1: Learners will acquire the skills like effective communication, decision making, problem solving in day to day business affairs

PSO – 2: Students will demonstrate progressive affective domain development of values, the role of accounting in society and business.

PSO – 3: Students will learn relevant financial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.

PSO – 4: Students will learn relevant managerial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.

PSO – 5: Learners will gain thorough systematic and subject skills within various disciplines of commerce, business, accounting, economics, finance, auditing and marketing.

PSO – 6: Learners will be able to recognise features and roles of businessmen, entrepreneur, managers, consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision making.

PSO–7: Learners will be able to prove proficiency with the ability to engage in competitive exams like CA, CS, ICWA and other courses.

PSO – 8: Students will be able to demonstrate progressive learning of various tax issues and tax forms related to individuals. Students will be able to demonstrate knowledge in setting up a computerized set of accounting books

PSO – 9: Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposure.

PSO – 10: Learners can also acquire practical skills to work as tax consultant, audit assistant and other financial supporting services.

PSO -11: Learners will be able to do higher education and advance research in the field of commerce and finance.

B.COM (COMPUTER APPLICATIONS) PROGRAM:

PROGRAMME SPECIFIC OUTCOMES

PSO – 1: Students will be able to acquire specific knowledge and skills relevant to their disciplines and careers. This program satisfies the educational entrance requirements for membership of relevant professional bodies.

PSO – 2: To acquire basic knowledge in information technology and its applications in the area of business, updated knowledge of computer application in trade, commerce, data security and safety. IOT, web technology, digital marketing and E- Commerce.

PSO – 3: To demonstrate and understanding of the Basics of Computer Applications in business and e- commerce, trade , Computerized Accounting, finance, economic and business law.

PSO- 4: To develop numerical abilities of students, to inculcate writing skills and business correspondence, e- mail and internet applications to create awareness of law and legalisations related to commerce and business

PSO – 5: To introduce recent trends in business, organisations and industries, to acquire practical skills related with e- banking and other e- business.

PSO – 6: To inculcate various computer skills to Computers , Operating system , Word Processing, Spread Sheet, Power point presentation ,

PSO – 7: To equip the students with finer nuances of MIS. An over view of management information system, Foundation of information system, Business applications of information technology.

BACHOLOR OF BUSINESS ADMINISTRATION

PROGRAMME OUTCOME (PO)

PO – 1: At the end of the three year Bachelors in Business Administration program, students would gain a thorough grounding in the fundamentals of business management.

PO- 2: To develop comprehensive professional skills those are required for a business administration graduate and to develop language abilities of students to inculcate writing skills and Business correspondence

PO – 3: To apply the knowledge of accounting fundamentals, and financial management to the solution of complex accounting & management problems

PO – 4: To develop Self-employment of young entrepreneurs and to create corporate professionals

PO – 5: To create awareness of Law and Legislations related to healthcare and business and Practical orientation in the area of hospitals and healthcare

PO – 6: To develop wide spectrum of managerial skills along with competency building, qualities in specific areas of business studies

PO – 7: To have successful career in all Economics, accounting, finance and to pursue higher education and research

PO – 8: Problem solving through the application of appropriate theories, principles and data

PO – 9: The industry and entrepreneurship oriented curriculum offers a number of specializations and practical exposures which would equip the student to face the contemporary challenges in the field.

PO – 10: The holistic outlook of the program with a number of value based and personality development courses ensures that students are groomed into up-to-date, assertive and effective business executives with strong leadership skills and social consciousness.

BBA PROGRAM SPECIFIC OUTCOME (PSO)

PSO – 1:after completing 3 years of the programme students specifically able to recognize the need to adapt business practices to the opportunities and challenges of an evolving global environment.

PSO - 2: Demonstrate ability to recognize and identify ethical conflicts, apply ethical reasoning and assess response options relative to the needs and interests of relevant stakeholders to address issues in a business context.

PSO - 3: Identify, evaluate, analyze, interpret and apply information to address problems and make reasoned decisions in a business context.

PSO - 4: Communicate in a business context in a clear, concise, coherent and professional manner.

PSO - 5: Demonstrate the understanding and ability to apply professional standards, theory, and research to address business problems within specific concentrations.

PSO – 6: Students will acquire and demonstrate analytical and problem solving skills within various disciplines of management, business, accounting, economics, finance, and marketing.

PSO – 7: Students will be able to identify characteristics and roles of leader, managers, group roles, which will help students to possess effective communication skills and to respond appropriately when confronted with moral and ethical dilemmas and exhibit rational behaviour.

PSO–8: Students will be able to demonstrate proficiency with the ability to engage in critical thinking by analyzing situations and constructing and selecting viable solutions to solve problems and apply appropriate problem solving and decision making skills in business decisions.

PSO – 9: Students will acquire the communication, research and technological skills needed to analyze a business situation (problem and opportunity) and prepare and present a management report and take strategic decisions.

PSO – 10: Students will engage in at least one internship or service learning experience to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain career related experiences.

PSO – 11: Students will develop critical thinking abilities and a foundation of ethical principles that allows them to work respectfully, ethically and professionally with people of diverse cultural, gender backgrounds.



MVS GOVT. DEGREE COLLEGE (AUTONOMOUS), MAHABUBNAGAR.

DEPARTMENT OF PHISICS

Learning Outcomes for undergraduate Education in Physics

1. Some of the characteristic attributes of a graduate in Physics are

- **Disciplinary knowledge and skills:** Capable of demonstrating
 - (i) good knowledge and understanding of major concepts, theoretical principles and experimental findings in Physics and its different subfields like Astrophysics and Cosmology, Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science and other related fields of study, including broader interdisciplinary subfields like Chemistry, Mathematics, Life sciences, Environmental sciences, Atmospheric Physics, Computer science, Information Technology etc.
 - (ii) ability to use modern instrumentation and laboratory techniques to design and perform experiments is highly desirable in almost all the fields of Physics listed above.
- **Skilled communicator:** Ability to transmit complex technical information relating all areas in Physics in a clear and concise manner in writing and oral ability to present complex and technical concepts in a simple language for better understanding.
- **Critical thinker and problem solver:** Ability to employ critical thinking and efficient problem-solving skills in all the basic areas of Physics.
- **Sense of inquiry:** Capability for asking relevant/appropriate questions relating to the

issues and problems in the field of Physics, and planning, executing and reporting the results of a theoretical or experimental investigation.

- **Team player/worker:** Capable of working effectively in diverse teams in both classroom, laboratory, Physics workshop and in industry and field-based situations.
- **Skilled project manager:** Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical scientific conduct; and safety and laboratory hygiene regulations and practices.
- **Digitally Efficient:** Capable of using computers for simulation studies in Physics and computation and appropriate software for numerical and statistical analysis of data, and employing modern e-library search tools like Infilbnet, various websites of the renowned Physics labs in countries like the USA, Europe, Japan etc. to locate, retrieve, and evaluate Physics information.
- **Ethical awareness / reasoning:** The graduate should be capable of demonstrating ability to think and analyze rationally with modern and scientific outlook and identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights, and adopting objectives, unbiased and truthful actions in all aspects of work.
- **National and international perspective:** The graduates should be able to develop a national as well as international perspective for their career in the chosen field of the academic activities. They should prepare themselves during their most formative years for their appropriate role in contributing towards the national development and projecting our national priorities at the international level pertaining to their field of interest and future expertise.
- **Lifelong learners:** Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling in all areas of Physics.

The graduates should be able to:

- Demonstrate
 - (i) a fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas like Astrophysics, Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science and applications, and its linkages with related disciplinary areas/subjects like Chemistry, Mathematics, Life

sciences, Environmental sciences, Atmospheric Physics, Computer science, Information Technology;

(ii) procedural knowledge that creates different types of professionals related to different areas of study in Physics outlined above, including research and development, teaching and government and public service;

(iii) skills in areas related to specialization area relating the subfields and current developments in the academic field of Physics.

- Use knowledge, understanding and skills required for identifying problems and issues relating to Physics, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources from various Physics laboratories of the world, and their application, analysis and evaluation using methodologies as appropriate to Physics for formulating new theories and concepts.
- Communicate the results of studies undertaken accurately in a range of different contexts using the main concepts, constructs and techniques of Physics. Develop communication abilities to present these results in technical as well as popular science meetings organized in various universities and other private organizations.
- Ability to meet one's own learning needs, drawing on a range of current research and development work and professional materials, and interaction with other physicists around the world.
- Apply one's knowledge of Physics and theoretical and laboratory skills to new/unfamiliar contexts to identify and analyse problems and issues and solve complex problems in Physics and related areas with well-defined solutions.
- Demonstrate Physics-related technological skills that are relevant to Physics-related job trades and employment opportunities.

2. Program learning outcomes relating to B.Sc. Courses in Physics:

The student graduating with the Degree B.Sc. with physics should be able to

- Acquire
 - (i) a fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Astrophysics, Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science, and its

linkages with related disciplinary areas / subjects like Chemistry, Mathematics, Life sciences, Environmental sciences, Atmospheric Physics, Computer science, Information Technology;

(ii) procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service;

(iii) skills in areas related to one's specialization area within the disciplinary/subject area of Physics and current and emerging developments in the field of Physics.

- Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
- Recognize the importance of mathematical modeling simulation and computing, and the role of approximation and mathematical approaches to describing the physical world.
- Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics
- Demonstrate relevant generic skills and global competencies such as
 - (i) problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary-area boundaries;
 - (ii) investigative skills, including skills of independent investigation of Physics-related issues and problems;
 - (iii) communication skills involving the ability to listen carefully, to read texts and research papers analytically and to present complex information in a concise manner to different groups/audiences of technical or popular nature;
 - (iv) analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Physics and ability to translate them with popular language when needed;
 - (v) ICT skills;
 - (vi) personal skills such as the ability to work both independently and in a group.

- Demonstrate professional behavior such as
- (i) being objective, unbiased and truthful in all aspects of work and avoiding unethical, irrational behavior such as fabricating, falsifying or misrepresenting data or committing plagiarism;
- (ii) the ability to identify the potential ethical issues in work-related situations;
- (iii) appreciation of intellectual property, environmental and sustainability issues; and
- (iv) promoting safe learning and working environment.

MECHANICS (I PAPER)

(i) Course learning outcome:

After going through the course, the student should be able to

- Understand laws of motion and their application to various dynamical situations, notion of inertial frames and concept of Galilean invariance. He / she will learn the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.
- Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.
- Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.
- Understand the phenomena of collisions and idea about center of mass and laboratory frames and their correlation.
- Understand the principles of elasticity through the study of Young Modulus and modulus of rigidity.
- Understand simple principles of fluid flow and the equations governing fluid dynamics.
- Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation.
- Explain the phenomena of simple harmonic motion and the properties of systems executing such motions.
- Describe how fictitious forces arise in a non-inertial frame, e.g., why a person

sitting in a merry-go-round experiences an outward pull.

- Describe special relativistic effects and their effects on the mass and energy of a moving object.
- appreciate the nuances of Special Theory of Relativity (STR)
- In the laboratory course, the student shall perform experiments related to mechanics (compound pendulum), rotational dynamics (FlyWheel), elastic properties (Young Modulus and Modulus of Rigidity) and fluid dynamics (verification of Stokes law, Searle method) etc.

(ii) Broad contents of the course:

- Fundamental of Dynamics
- Work and Energy
- Collisions
- Rotational Dynamics
- Elasticity
- Fluid Motion
- Gravitation and cathode force Motion
- Oscillation
- Non-inertial Systems
- Special Theory of Relativity

(iii) Skills to be learned:

- Learn basics of the kinematics and dynamics linear and rotational motion.
- Learn the concepts of elastic in constant of solids and viscosity of fluids.
- Develop skills to understand and solve the equations of Newtonian Gravity and central force problem.
- Acquire basic knowledge of oscillation.
- Learn about inertial and non-inertial systems and essentials of special theory of relativity.

THERMAL PHYSICS (II PAPER)

(i) Course learning outcome:

- Comprehend the basic concepts of thermodynamics, the first and the second law of thermodynamics, the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations.
- Learn about Maxwell's thermodynamic relations.
- Learn the basic aspects of kinetic theory of gases, Maxwell-Boltzmann distribution law, equipartition of energies, mean free path of molecular collisions, viscosity, thermal conductivity, diffusion and Brownian motion.
- Learn about the real gas equations, Van der Waals equation of state, the Joule-Thompson effect.
- In the laboratory course, the students are expected to do some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, temperature coefficient of resistance, variation of thermo-emf of a thermocouple with temperature difference at its two junctions and calibration of a thermocouple.

(ii) Broad contents of the course:

- α. Zeroth and First Law of Thermodynamics
- β. Second Law of Thermodynamics
- γ. Entropy
- δ. Thermodynamic Potentials
- ε. Maxwell's Thermodynamic Relations
- φ. Kinetic
Theory of
Gases :
Distribution
of Velocities
Molecular
Collisions
Real Gases

(iii) Skills to be learned:

α . This basic course in thermodynamics will enable the student to understand various thermo dynamical concepts, principles.

ELECTROMAGNETIC THEORY (III PAPER)

(i) Course learning outcome:

- Achieve an understanding of the Maxwell's equations, role of displacement current, gauge transformations, scalar and vector potentials, Coulomb and Lorentz gauge, boundary conditions at the interface between different media.
- Apply Maxwell's equations to deduce wave equation, electromagnetic field energy, momentum and angular momentum density.
- Analyse the phenomena of wave propagation in the unbounded, bounded, vacuum, dielectric, guided and unguided media.
- Understand the laws of reflection and refraction and to calculate the reflection and transmission coefficients at plane interface in bounded media.
- Understand the linear, circular and elliptical polarisations of EM waves. Production as well as detection of waves in laboratory.
- Understand propagation of EM waves in anisotropic media, uni-axial and biaxial crystals phase retardation plates and their uses.
- Understand the concept of optical rotation, theories of optical rotation and their experimental rotation, calculation of angle rotation and specific rotation.
- Understand the features of planar optical wave guide and obtain the Electric field components, Eigen value equations, phase and group velocities in a dielectric wave guide.
- Understand the fundamentals of propagation of electromagnetic waves through optical fibres and calculate numerical apertures for step and graded indices and transmission losses.
- In the laboratory course, the student gets an opportunity to perform experiments Demonstrating principles of
- Interference, Refraction and diffraction of light using monochromatic sources of light. Demonstrate interference, Refraction and Diffraction using microwaves.
- Determine the refractive index of glass and liquid using total internal reflection of light.
- Verify the laws of Polarisation for plane polarised light.

- Determine Polarisation of light by Reflection and determine the polarization angle off or air-glass surface
- Determine the wavelength and velocity of Ultrasonic waves in liquids using diffraction.
- Study specific rotation of sugar using Polarimeter.
- Analyze experimentally the Elliptically Polarised light using Babinet's Compensator
- Study Experimentally the angle dependence of radiation for a simple dipole antenna
- Plan and Execute 2-3 group projects for designing new experiments based on the Syllabi.

(ii) Broad contents of the course:

- Review of Maxwell's equations
- EM wave propagation in unbounded media of various types
- EM wave propagation in bounded media separated by two types of media
- Polarization of electromagnetic waves
- Wave guides
- Optical fibres

(iii) Skills to be learned:

- Comprehend the role of Maxwell's equation in unifying electricity and magnetism.
- Derive expression for
 - (i) Energy density
 - (ii) Momentum density
 - (iii) Angular momentum density of the electromagnetic field
- Learn the implications of Gauge invariance in EM theory in solving the wave equations and develop the skills to actually solve the wave equation in various media like
 - (i) Vacuum
 - (ii) Dielectric medium
 - (iii) Conducting medium
 - (iv) Dilute plasma

- Derive and understand associated with the properties, EM wave passing through the interface between two media like
 - (i) Reflection
 - (ii) Refraction
 - (iii) Transmission
 - (iv) EM waves

- Learn the basic physics associated with the polarization of electromagnetic waves by doing various experiments for:
 - (i) Plane polarized light
 - (ii) Circularly polarized light
 - (iii) Circularly polarized light

- Learn the application of EM theory to
 - (i) Wave guides of various types
 - (ii) Optical fibers in theory and experiment

OPTICS (IV PAPER)

(i) Course learning outcome:

This course will enable the student to

- Recognize and use a mathematical oscillator equation and wave equation, and derive these equations for certain systems.
- Apply basic knowledge of principles and theories about the behaviour of light and the physical environment to conduct experiments.
- Understand the principle of superposition of waves, so thus describe the formation of standing waves.
- Explain several phenomena we can observe in everyday life that can be explained as wave phenomena.
- Use the principles of wave motion and superposition to explain the Physics of

polarisation, interference and diffraction.

- Understand the working of selected optical instruments like biprism, interferometer, diffraction grating, and holograms.
- In the laboratory course, student will gain hands-on experience of using various optical instruments and making finer measurements of wavelength of light using Newton Rings experiment, Fresnel Biprism etc. Resolving power of optical equipment can be learnt firsthand.
- The motion of coupled oscillators, study of Lissajous figures and behaviour of transverse, longitudinal waves can be learnt in this laboratory course.

(ii) Broad contents of the course:

- Superposition of Two Collinear Harmonic Oscillations
- Superposition of Two Perpendicular Harmonic Oscillations
- Waves Motion – General
- Velocity of Waves
- Superposition of Two Harmonics Waves

MODERN PHYSICS (V-A PAPER)

(i) Course learning outcome:

- Know main aspects of the inadequacies of classical mechanics and understand historical development of quantum mechanics and ability to discuss and interpret experiments that reveal the dual nature of matter.
- Understand the theory of quantum measurements, wave packets and uncertainty principle.
- Understand the central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalization techniques, skill development on problem solving e.g. one dimensional rigid box, tunneling through potential barrier, step potential, rectangular barrier.
- Understanding the properties of nuclei like density, size, binding energy, nuclear

forces and structure of atomic nucleus, liquid drop model and nuclear shell model and mass formula.

- Ability to calculate the decay rates and lifetime of radioactive decays like alpha, beta, gamma decay. Neutrinos and its properties and role in theory of beta decay.
- Understand fission and fusion well as nuclear processes to produce nuclear energy in nuclear reactor and stellar energy in stars.
- Understand various interactions of electromagnetic radiation with matter. Electron positron pair creation.
- In the laboratory course, the students will get opportunity to perform the following experiments
- Measurement of Planck's constant by more than one method.
- Verification of the photoelectric effect and determination of the work Function of a metal.
- Determination of the charge of electron and e/m of electron.
- Determination of the ionization potential of atoms.
- Determine the wavelength of the emission lines in the spectrum of Hydrogen atom.

- Determine the absorption lines in the rotational spectrum of molecules.
- Verification of the law of the Radioactive decay and determine the mean life time of a Radioactive Source, Study the absorption of the electrons from Beta decay. Study of the electron spectrum in Radioactive Beta decays of nuclei.
- Plan and Execute 2-3 group projects in the field of Atomic, Molecular and Nuclear Physics in collaboration with other institutions, if, possible where advanced facilities are available.

(ii) Broad contents of the course:

- Failure of classical physics and need for quantum physics.
- Various experiments establishing quantum physics and their interpretation.
- Wave-particle duality, uncertainty relation and their implications.
- Schrodinger equation and its simple applications in one dimensional potential problems of bound states and scattering.
- Elementary introduction of Nuclear Physics with emphasis on

(i) Nuclear Structure

- (ii) Nuclear Forces
- (iii) Nuclear Decays
- (iv) Fission and Fusion

(iii) Skills to be learned:

- Comprehend the failure of classical physics and need for quantum physics.
- Grasp the basic foundation of various experiments establishing the quantum physics by doing the experiments in laboratory and interpreting them.
- Formulate the basic theoretical problems in one, two and three dimensional physics and solve them.
- Learning to apply the basic skills developed in quantum physics to various problems in

- (i) Nuclear Physics
- (ii) Atomic Physics

COMPUTATIONAL PHYSICS (V-B PAPER)

(i) Course learning outcome:

- Learn the importance of computers in solving problems in Physics.
- Learn how to plan for writing the algorithm for solving a problem by drawing the flowchart of simple problems like roots of quadratic equations etc.
- Have a working knowledge about the Linux system, for example, the necessary commands.
- Learn, write and run FORTRAN programs in the Linux system. In particular, they should attempt the following exercises:
 - (i) Exercises on syntax on usage of FORTRAN.
 - (ii) Usage of GUI windows, Linux commands, familiarity with DOS commands and working in an editor to write sources codes in FORTRAN.
 - (iii) To print out all natural even/ odd numbers between given limits.
 - (iv) To find maximum, minimum and range of a given set of numbers.

- The students should also learn “Scientific Word Processing”, particularly, how to use the LaTeX software in writing articles and papers which include mathematical equations and diagrams. Similarly, students should learn the basics of Gnuplot.
- To have hands-on experience on computational tools, students are expected to do the following exercises:
 - (i) to compile a frequency distribution and evaluate mean, standard deviation etc,
 - (ii) to evaluate sum of finite series and the area under a curve,
 - (iii) to find the product of two matrices
 - (iv) to find a set of prime numbers and Fibonacci series,
 - (v) to write program to open a file and generate data for plotting using Gnuplot,
 - (vi) plotting trajectory of a projectile projected horizontally,
 - (vii) plotting trajectory of a projectile projected making an angle with the horizontal direction,
 - (viii) creating an input Gnuplot file for plotting a data and saving the output for seeing on the screen, saving it as an eps file and as a pdf file,
 - (ix) to find the roots of a quadratic equation,
 - (x) numerical solution of equation of motion of simple harmonic oscillator and plot the outputs for visualization,
 - (xi) Simulate the motion of a particle in a central force field and plot the output for visualization.

(ii) Broad contents of the course:

- Introduction
- Scientific Programming
- Control Statements
- Scientific word processing: Introduction to LATEX
- Visualization

(iii) Skills to be learned:

- The students should learn the skills for writing a flow chart and then writing the corresponding program for a specific problem using the C/ C⁺⁺/FORTRAN

language.

- The student should also acquire the proficiency in effectively using the GUI Windows, the LINUX operating system and also in using the LaTeX software for writing a text file.

ELECTRONICS (VI-A PAPER)

(i) Course learning Outcome:

By the end of this course, the students will be able to: 1. Identify the different electronics components used in electronic circuits. 2. Understand the working of solidstate semiconductor devices used in the circuit 3. Understand different concepts of electronics and network theorem. 4. Understand different concepts of semiconductor materials and devices. 5. Determine various parameters and V-I characteristics of diodes and transistors.

Understand the concepts of digital electronics 3. Understand the basic working of different logic gates and laws of Boolean algebra, De Morgan theorem, NOR & NAND logic for simplification of circuits. 4. Understand the concepts of K-maps and designing of logic circuits. 5. Understand and design different controlling circuits used in digital electronics

1. Describe working, characteristics and applications of semiconductor devices. Understand and describe special highpower semiconductor.
2. Analyze different parameters and relation between the different terms related to amplifier.
3. Classification of different amplifier and analyze the concepts of different types of amplifiers.
4. Understand the concepts of different logic family and comparison of different parameters of logic family.
5. Understand the concept of sequential logic circuits and study of different sequential circuit with reference to storage.
6. Understand different counting circuits and their applications. 4. Understand different digital storage devices, memory, and their classification with expansion.
7. Understand the concepts and ideas of designing circuit using computers.
8. Understand circuit maker software
9. Analyze different parameters of simple circuit and setting of different parameters using circuit maker
10. Understand the concept of virtual instrumentation and advance virtual instrumentation
11. Describe OPAMP as different types of RC, AC ASCILLATORS
12. Understand OP AMP as multi vibrators

13. Design and explain A to D and D to A converters.
14. Describe the positive and negative feedback and advantages of positive feedback

(ii) Skills to be learned:

At the end of the course, a student will be able to:

1. Convert different type of codes and number systems which are used in digital communication and computer systems.
2. Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
3. Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
4. Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.
5. Apply the fundamental knowledge of analog and digital electronics to get different types analog to digitalized signal and vice-versa converters in real world with different changing circumstances.
6. Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.

APPLIED OPTICS (VI-B PAPER)

(i) Course learning outcome:

This course will enable the student to get

- Familiar with optical phenomena and technology.
- Qualitative understanding of basic lasing mechanism, types of Lasers, characteristics of Laser Light, types of Lasers, and its applications in developing LED, Holography.

- The idea of propagation of electromagnetic wave in a nonlinear media – Fibre optics as an example will enable the student to practice thinking in a logical process, which is essential in science.
- Experiments in this course will allow the students to discuss in peer groups to develop their cooperative skills and reinforce their understanding of concepts.

(ii) Broad contents of the course:

- Sources and Detectors
- Fourier Optics
- Holography
- Photonics: Fibre Optics

(iii) Skills to be learned:

This course will help in understanding about the lasers and detectors, Holography, Optical fibre and their applications.

RENEWABLE ENERGY AND ENERGY HARVESTING **(SEC III SEM)**

(i) Course learning outcome:

- The students are expected to learn not only the theories of the renewable sources of energy, but also to have hands-on experiences on them wherever possible. Some of the renewable sources of energy which should be studied here are: (i) off-shore wind energy, (ii) tidal energy, (iii) solar energy, (iv) biogas energy and (v) hydroelectricity.

All these energy sources should be studied in detail.

- Learn about piezoelectricity, carbon- captured technologies like cells, batteries.
- The students should observe practical demonstrations of
- (i) training modules of solar energy, wind energy etc.,

- (ii) Conversion of vibration into voltage using piezoelectric materials,
- (iii) conversion of thermal energy into voltage using thermoelectric modules.

(ii) Broad contents of the course:

- Fossil fuels and Alternate Sources of Energy
- Solar energy
- Wind Energy harvesting
- Ocean Energy
- Geothermal Energy
- Hydro Energy
- Piezoelectric Energy Harvesting
- Electromagnetic Energy Harvesting

(iii) Skills to be learned:

- In this course student will study non –conventional energy sources and their practical applications.

WEATHER FORECASTING (SEC IV SEM)

(i) Course learning outcome:

- Acquire basic knowledge of the elements of the atmosphere, its composition at various heights, variation of pressure and temperature with height.
- To learn basic techniques to measure temperature and its relation with cyclones and anti-cyclones.
- Knowledge of simple techniques to measure wind speed and its directions, humidity and rainfall. Absorption, emission and scattering of radiations in atmosphere. Radiation laws.
- Knowledge of global wind systems, jet streams, local thunderstorms, tropical cyclones, tornadoes and hurricanes.
- Knowledge of climate and its classification. Understanding various causes of climate change like global warming, air pollution, aerosols, ozone depletion, acid rain.
- Develop skills needed for weather forecasting, mathematical simulations,

weather forecasting methods, types of weather forecasting, role of satellite observations in weather forecasting, weather maps etc. Uncertainties in predicting weather based on statistical analysis.

- In the laboratory course, students should be able to learn:
- Principle of the working of a weather Station, Study of Synoptic charts and weather reports.
- Processing and analysis of weather data.
- Exercises in reading of Pressure charts, Surface charts, Wind charts and their analysis.
- Develop ability to do weather forecasts using input data.
- Assign Group Activity to observe and examine:
 - i. Sunniest and driest day of the week
 - ii. Keep record of daily Temp, Pressure, rainfall and wind velocity
 - iii. Prepare regular reports of the above observations and circulate it through the local media for the benefit of local community.

(ii) Broad contents of the course:

- Introduction to atmosphere
- Measuring the weather
- Weather systems
- Climate and climate change
- Basics of weather forecasting

(iii) Skills to be learned:

- Learn the physical parameters to describe the basic structure of atmosphere and make their measurements.
- Understand the weather system and learn to measure the parameter describing the weather and its changes.
- Learn basic ideas about climate and physical factors affecting climate change.
- Learn basic physics of weather forecasting.

PHYSICS WORKSHOP SKILLS (SEC V SEM)

(i) Course learning outcome:

- After the successful completion of the course the student is expected to acquire skills/ hands on experience / working knowledge on various machine tools, lathes, shapers, drilling machines, cutting tools, welding sets and also in different gear systems, pulleys etc. He /she will also acquire skills in the usage of multimeters, soldering iron, oscilloscopes, power supplies and relays.

(ii) Broad contents of the course:

- Introduction to make simple length, height, time, area, volume measurements.
- Mechanical skills needed to the workshop practice.
- Electrical and electronics skills related to the measurement of various electrical and electronics quantities.
- Introduction to Prime Movers.

(iii) Skills to be learned:

- Learn to use mechanical tools to make simple measurement of length, height, time, area and volume.
- Obtain hand on experience of workshop practice by doing casting, foundry, machining, welding and learn to use various machine tool like lathe shaper, milling and drilling machines etc. and working with wooden and metal blocks.
- Learn to use various instruments for making electrical and electronics measurements using multimeter, oscilloscopes, power supply, electronic switches and relays.
- Wave Optics
- Interference
- Michelson's Interferometer
- Diffraction
- Fraunhofer Diffraction

- Fresnel Diffraction
- Holography
- He / she shall develop an understanding of various aspects of harmonic oscillations and waves specially.
 - (i) Superposition of collinear and perpendicular harmonic oscillations
 - (ii) Various types of mechanical waves and their superposition.
- This course in basics of optics will enable the student to understand various optical phenomena, principles, workings and applications optical instruments.

ENVIRONMENTAL PHYSICS (SEC VI SEM)

The course focuses on three main environmental issues:

1. Ionizing radiation and radioactivity
2. UV-radiation and the ozone layer
3. Greenhouse effect and climate

These subjects include among other Natural background radiation, radon, the benefits and risks related to radioactive sources and radioactive pollution, the use of ionizing radiation in medicine and research, nuclear power, fusion, fission, biological consequences of ionizing radiation, radiation induced cancer; Production and destruction of ozone and the ozone layer, the development of the ozone hole, UV radiation, measurements of ozone and UV radiation, biological effects related to too much and too little UV-exposure, D-vitamin deficiency, skin cancer; The atmosphere and its composition, the greenhouse effect, the role of the greenhouse effect for life on earth, green house gasses, the variations in the global green house effect and its consequences.

(i) Course Learning outcomes:

The students shall

- acquire basic knowledge within selected environmental topics (ionizing radiation, radioactivity, UV-radiation, atmospheric ozone, greenhouse effect and climate, and biological effects related to these)
- be able to ask critical questions and perform scientifically based evaluations about current important environmental subjects
- be able to perform calculations within the selected environmental topics
- on their own be able to obtain information from external sources needed to answer a given question related to the selected environmental topics

ELECTRICAL AND ELECTRONIC APPLIANCES (GE V SEM)

(i) Course Learning Outcome:

1. Students will have a firm foundation in the fundamentals and application of theory and laws of physics in field of technology.
2. Students are able to use modern library searching and retrieval methods to obtain information about experimental techniques used for understanding laws of physics.
3. They are skilled in problems solving, critical thinking, analytical reasoning, understanding the ethical, historical and environmental dimensions of problems and issues in the field of physics and technology.
4. They are able to use modern instrumentation and classical techniques, to design experiments, for improvement in technology in use for betterment of human life.
5. Knows the proper procedures and regulations for safe handling and use of electric and electronic devices and can follow the proper procedures and regulations for safe handling when working with electric appliances.
6. Are able to identify and solve problems and explore new areas of research and are also able to communicate the results of their work in oral, written and electronic formats.
7. Ability to find gainful employment in industries like manufacturing of hardware, electronic and electric appliances etc. Ability to find employment in Govt. Organizations and academic institutions.

ELECTRICAL CIRCUITS AND NETWORK SKILLS (GE VI SEM)

(i) Course learning outcome:

After the completion of the course the student will acquire necessary skills/ hands on experience /working knowledge on multimeters, voltmeters, ammeters, electric circuit elements, dc power sources, ac/dc generators, inductors, capacitors, transformers, single phase and three phase motors, interfacing dc/ac motors to control and measure, relays and basics of electrical wiring.

(ii) Broad contents of the course:

- a. Basic principles of electricity, electrical circuits and electrical drawings.
- b. Physics of generators, transformers, electric motors.
- c. Solid state devices and their uses.
- d. Electrical wiring and measures for electrical protection.

(iv) Skills to be learned:

- a. Skills to understand various types of DC and AC circuits and making electrical drawings with symbols for various systems.
- b. Skills to understand and operate generators, transformers and electric motors.
- c. Develop knowledge of solid state devices and their uses.
- d. Skills to do electrical wiring with assured electrical protection devices.

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*Program Outcomes, Program Specific Outcomes and Course
Outcomes*

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Head of the Department

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Lecturer in Microbiology

Department of Microbiology
MVS Govt. Degree and PG College
Mahabubnagar

DEPARTMENT OF MICROBIOLOGY

Program Outcomes, Program Specific Outcomes and Course Outcomes

Programme Outcomes (POs)	<p>After completion of B.Sc. Microbiology programme, the students will be able to</p> <ul style="list-style-type: none">❖ Perform the basic techniques related to screening, isolation and cultivation of microorganisms from various sources❖ Study the microorganism with regard to morphology, cultural and biochemical characters. It will help to classify the microbes to certain extent.❖ Follow the aseptic techniques and conduct the process of sterilization as well as perform the techniques to control the microorganism❖ Understand microorganisms and their relationship with the environment,❖ Produce and analyze the microbial products at laboratory level❖ Conduct the basic research with these microorganisms and perform the diagnostic procedures required in food, milk and pharmaceutical industries. <p>M.Sc. (Microbiology) completion of M.Sc. (Microbiology), students are able to:</p> <ul style="list-style-type: none">❖ Instill the intellectual skills to analyze the molecules using advance biophysical techniques such as HPLC, GC, AAS, PCR etc.❖ Perform the quantitative/ qualitative analysis of Biomolecules and understand various biochemical pathways❖ Acquire knowledge and understanding the concepts of Microbial genetics, Molecular biology, Immunology, Enzymology.❖ Explore the scientific literature effectively and use computational tools such as bio-statistical and bioinformatics❖ Implement the knowledge in industry with regard to scale up, production, scale down and quality control of the various microbial products❖ Conduct the basic research related to industry-environmental issues and use of agricultural for sustainable products
Programme Specific Outcomes (PSOs)	<ul style="list-style-type: none">❖ Understand the contributions of various scientist in microbiology and scope of various branches❖ Understand various kinds of prokaryotic & eukaryotic microbes and their interactions❖ Explain and describe importance of organic compounds and its chemistry found in living cells❖ Understand and explain various processes of metabolism of carbohydrates amino acids and vitamins❖ Explain DNA, RNA and protein structure and their synthesis❖ Understand the concept of disease development, spread, control and eradication from society❖ Understand the basic concepts of gene and their regulation of action❖ Have developed a good knowledge of the development of the discipline of Microbiology and the contributions made by prominent scientists in this field.❖ Have developed a very good understanding of the characteristics of different types of microorganisms, methods to organize/classify these into and basic tools to study these in the laboratory.❖ Are able to explain the useful and harmful activities of the microorganisms.❖ Are able to perform basic experiments to grow and study microorganisms in the laboratory❖ Explain and write various industrial fermentations and bioinstrumentation.

Sem & Paper	Course Outcomes (COs)
Course: Sem I Paper 1 : History	<ul style="list-style-type: none"> ❖ Understand the contributions of eminent scientists in the development of microbiology ❖ On successful completion of this subject the students will gain basic knowledge about Microbiology starting from history, Basic laboratory techniques and basic knowledge about the micro organisms. ❖ Students will get basics and importance of Microbiology. Theory & practical's of Microscopy, staining, sterilization, characterization of microbes along with microbial structure will be studied. ❖ Get an idea about the historical events in microbiology. ❖ Understand the diversity in microbiology. ❖ Know the scope of Microbiology. ❖ Understand the taxonomic classification of microorganisms
Course: Sem I Paper 1 : Microscopy and staining Method	<ul style="list-style-type: none"> ❖ Understand and explain basic principles and different kinds of microscope ❖ Explain the process of different staining techniques ❖ Understand and compare various types of stains and dyes the determination of specific nutrients by bacteria ❖ Know parts of microscope, type and its principal ❖ Get the theoretical concepts of related stain ❖ Understand different methods of staining techniques
Course: Sem I Paper 1 : Isolation and Identification of Micro Organisms	<ul style="list-style-type: none"> ❖ Design an experiment to isolate specific bacteria in pure form from sample ❖ Determine the sensitivity of specific bacteria. ❖ Understand different methods of staining techniques to given antibiotics ❖ Concept of culture and type of culture ❖ Cultivation methods of bacteria, yeast, fungi and virus ❖ The students in this course learn different types of pure culture techniques, preservation of pure culture and culture collection centers. ❖ This topic also introduces the students to the different types of media and teaches about isolation of strain and improvement. ❖ Develop and have thorough knowledge of developing pure cultures and methods of preservation techniques. ❖ The students will be able to isolate Cultures in pure form and preserve cultures for further use
Course: Sem I Paper 1 : Structure and General Characteristics of Microorganisms	<ul style="list-style-type: none"> ❖ Compare prokaryotic organism with eukaryotic organism ❖ Understand the importance of methane producing bacteria ❖ Write the method of reproduction in algae fungi and protozoa ❖ Understand and compare the characteristics properties of virus with other microbes ❖ Understand various kinds of positive and negative interactions of different microbes ❖ Microbial taxonomy – concepts and techniques for identification ❖ Concept related to extremophilic microbes and archea ❖ Characters and significance of algae and fungi ❖ Characters and significance of virus
Course: Sem II Paper 2 : Microbial Nutrition and Growth	<ul style="list-style-type: none"> ❖ Understand the basic nutritional requirements of bacteria. ❖ Describe various types of nutrient media for cultivation and isolation of bacteria. ❖ Explain typical growth curve of bacteria. ❖ Understand the factors responsible for bacterial growth
Course: Sem II Paper 2 : Microbial Metabolism	<ul style="list-style-type: none"> ❖ Understand the general strategy of metabolism. ❖ Understand and explain various metabolic processes operating in living cell

	<ul style="list-style-type: none"> ❖ Understand the mechanism by which energy is generated in human body ❖ Explain and describe the process of protein formation in living cell ❖ Explain and describe the process of replication of DNA
Course: Sem II Paper 2 : Biomolecules	<ul style="list-style-type: none"> ❖ Understand the classification of organic compounds like carbohydrates ❖ Understand the chemistry of different kinds of carbohydrates ❖ The basic component or biomolecules of living organisms ❖ The Definition, classification, biological function and chemical and physical properties of carbohydrates. ❖ The Definition, classification, biological function and chemical and physical properties of Lipids ❖ Detection of biomolecules, ❖ Structure and properties of Biomolecules. ❖ Transport and energy metabolism. ❖ Metabolism of carbohydrates, lipids, amino acid, nucleotide. ❖ Metabolic pathways and Bioenergetics. ❖ Understand the fundamental biochemical principles, such as the structure/function of biomolecules. ❖ Gain knowledge on current <i>biochemical</i> and molecular technique and carry out experiments.
Course: Sem II Paper 2 : Biochemical Techniques	<ul style="list-style-type: none"> ❖ This skill based course will teach the students the various instrumentations that are used in the analytical laboratories. ❖ This topic covers both fundamental and applications of the instruments that are routinely used for the characterization of biomolecules ❖ The student has the basic knowledge on the theory, operation and function of analytical instruments
Course: Sem III Paper 3 : Microbial Nutrition and Photosynthesis	<ul style="list-style-type: none"> ❖ Understand the basic nutritional requirements of bacteria ❖ Describe various types of nutrient media for cultivation and isolation of bacteria ❖ Explain typical growth curve of bacteria. ❖ Understand the factors that responsible for bacterial growth Identify the various physiological groups of bacteria with their special features. ❖ Detail the macromolecules required for cell synthesis and growth as well as explain the various transport systems involved in the uptake of nutrients by bacteria. ❖ Prepare media for isolation and growth of microorganisms, describe the different stages, methods and measurement of microbial growth and how environmental factors (pH, temperature, salt concentration) effect microbial growth, metabolism, and physiology.
Course: Sem III Paper 3 : Microbial Growth	<ul style="list-style-type: none"> ❖ Understand the general strategy of metabolism ❖ Understand and explain various metabolic processes operating in living cell ❖ Understand the mechanism by which energy is generated in human body ❖ Explain and describe the process of protein formation in living cell ❖ Explain and describe the process of replication of DNA
Course: Sem III Paper 3 : Enzymes	<ul style="list-style-type: none"> ❖ Describe importance of vitamins to human body and their deficiency syndrome ❖ Compare DNA and RNA ❖ Understand the mechanism of enzyme. On completion of the course, students learn about: <ul style="list-style-type: none"> ○ Basic Enzymology ○ Enzyme kinetics and inhibitions ○ Catalytic mechanisms and regulation,

	<ul style="list-style-type: none"> ○ Industrial applications of enzymes and extremozymes ○ Regulation of enzyme ○ Various methods used for enzyme purification ○ Enzyme assays <ul style="list-style-type: none"> ❖ Explain the structure and function of enzymes, how enzymes are able to increase speed of a biochemical reaction, mechanisms of regulation of enzymatic action, importance of enzymes in regulation of metabolism ❖ Explain the principles of the energy-yielding and -consuming reactions, the various catabolic pathways (including fermentations and photosynthesis), and the mechanisms of energy conservation in microbial metabolism
Course: Sem IV Paper 4 : Genetics	<ul style="list-style-type: none"> ❖ On completion of this course, students will have the knowledge and skills to explain the key concepts in population, evolutionary and quantitative genetics. ❖ The course also provides comprehensive knowledge how genes are transferred from generation to generation. ❖ The student understands how alteration in genes results in various genetic disorders. ❖ To make the student to understand the concept of cell and their activities. student will understand the concept of genes and their behavior ❖ Students will be taught cell division, genetic materials, their structure and types, mechanism of replication of DNA. ❖ Students gain knowledge in gene concepts and genetic code, gene expression, gene regulation and also learn about mutation. ❖ The student will be able to identify and distinguish genetic regulatory mechanism. ❖ Analyze the basic concepts of hereditary and the process of inheritance, understand the functions and molecular structures of DNA and RNA and how they serve as genetic information and concept of plasmids and transposons.
Course: Sem IV Paper 4 : Mutations	<ul style="list-style-type: none"> ❖ Understand and describe various concepts – related with gene and its regulation ❖ Understand and explain various processes by which gene transfer occurs amongst microbes ❖ Explain the causes of gene mutation and their effect on cell. ❖ Understand concept of genes and chromosomes. ❖ Familiar with concept of mutations. ❖ Know the concepts of spontaneous mutations. ❖ Understand basics of immunology
Course: Sem IV Paper 4 : Gene Expression	<ul style="list-style-type: none"> ❖ On completion of course students are able to understand ❖ Concept of gene, gene-cistron relationship in prokaryotes and eukaryotes, ❖ DNA regulation and replication ❖ Types of DNA damage, DNA repair pathways ❖ Transcription in prokaryotes ❖ Protein synthesis and processing, posttranslational modifications of protein ❖ Gene regulation Enzymes in genetic engineering, vectors
Course: Sem IV Paper 4 : Recombinant DNA Technology	<ul style="list-style-type: none"> ❖ Methods of gene transfer Gene cloning, indirect and direct screening gene transfer techniques. ❖ Polymerase chain reaction and its applications ❖ Concept of gene regulation. ❖ Principles and applications of various molecular techniques. ❖ Concept, methods and application of r-DNA technology. ❖ Gene library and gene mapping ❖ Enzymes in genetic engineering, vectors ❖ Methods of gene transfer ❖ Gene cloning, indirect and direct screening gene transfer techniques

	<ul style="list-style-type: none"> ❖ This course teaches RDNA technology techniques and their application in the field of genetic engineering ❖ They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries ❖ Student of this course have knowledge on gene manipulation, gene expression, etc which prepares them for further studies in the area of genetic engineering
Course: Sem V Paper 5 : Microbes in Agriculture	<ul style="list-style-type: none"> ❖ Understand the role of microbes of soil in various important processes ❖ Describe and explain the applications of bacteria and fungi in bio fertilizers ❖ Approaches used in agriculture to control disease in plant ❖ Microbial ecology and microbial interaction ❖ Pathogenic interactions with plant ❖ Microbial biocontrol agents ❖ Concepts related to Plant pathology ❖ Various plant pathogens and disease ❖ Soil microbiology and xenobiotics ❖ The aim of this course is to impart knowledge in soil microflora, plant pathology and post harvest pathology. ❖ The students learn about water and waste water microbiology, air microbiology and their treatment processes. ❖ The student at the end of the course would have gained knowledge about microbial associations with soil and plants, plant diseases and their management, water treatment techniques and solid waste
Course: Sem V Paper 5 : Plant diseases and Bio control	<ul style="list-style-type: none"> ❖ Different environmental cycles, plant growth promoting microbes, Biological nitrogen fixation, Biocontrol in agricultural Microbiology were covered. ❖ Begin to understand the role of microbes in causing several common diseases, Know concepts related with of microbial interaction ❖ Get an idea regarding microbes and their relation with environment ❖ Understand the enumeration technique for microbes ❖ The aim of this course is to introduce the students to the role of biopesticides and biofertilizers in enhancing the fertility of soil ❖ The students also learn about the large scale production of biofertilizers and biopesticides and their mechanism of action and application. ❖ By the end of the course, the student will be able to gain knowledge about their commercialization.
Course: Sem V Paper 5 : Microbial Ecology	<ul style="list-style-type: none"> ❖ Plant growth promoting microorganisms, biocontrol, nitrogen fixing microbes role in favour of environment can be explored ❖ Students gain insights into microbial evolution and ecology. ❖ Get an idea regarding microbes and their relation with environment ❖ Understand the enumeration technique for microbes ❖ Understand Principle, working, ray diagram and application of advance microscopes ❖ Know concepts related with of microbial interaction ❖ Get an idea regarding microbes and their relation with environment ❖ Understand the enumeration technique for microbes
Course: Sem V Paper 5 : Role of Microbes and Environmental Pollution	<ul style="list-style-type: none"> ❖ Understand and explain the significance of bacteriological analysis of drinking water ❖ Understand and describe various methods applied for treatment of water and waste water ❖ Explain the methods for disposal of industrial wastes ❖ Bioremediation and biodegradation of xenobiotic compound, biomarkers and bioreporters

	<ul style="list-style-type: none"> ❖ Understand the role of microorganisms as plant growth promoting bacteria and understanding the characteristics of soil. ❖ To understand the concepts and approaches to manage plant pathogens and diseases in crops and natural plant communities by measures that have minimal impact on the environment. ❖ To understand the concept of nitrogen fixation and role of microorganisms in the geochemical cycles and host- microbe interactions ❖ Understand the role of microorganisms as agents of environmental change & recognize microorganisms as indicators & to understand microbial processes aimed to solve environmental problems.
<p>Course: Sem V Paper 6 : History of Immunology and immunity</p>	<ul style="list-style-type: none"> ❖ Understand and describe human body's resistance mechanism against disease ❖ Understand the properties, structure and importance of antibiotics in immunity . ❖ Describe and explain the reasons, classes and development of allergy in humans.
<p>Course: Sem V Paper 6 : Cells and Organs of Immune system</p>	<ul style="list-style-type: none"> ❖ Understand and write the role of human body's various organs in natural resistance on completion of the course, students are able to Understand: Immune system, types of immunity, primary and secondary lymphoid organ. ❖ Innate and acquired immunity, antigen, immune response primary and secondary immune response, complement system, interferons. ❖ This course gives an overview on the immune system including organs, cells and receptors ❖ The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions ❖ The course develops in the student an appreciation for principles of immunology and its applications in treating.
<p>Course: Sem V Paper 6 : Antigens and Antibody reactions Immunological Processes and applications</p>	<ul style="list-style-type: none"> ❖ On completion of the course, students are able to Understand: ❖ Immune system, types of immunity, primary and secondary lymphoid organ. ❖ Innate and acquired immunity, antigen, immuneresponse primary and secondary immune response, complement system, interferons. ❖ Ag-ab interactions,precipitation, agglutination, RIA, ELISA, monoclonal antibodies. ❖ Immunosuppresion, Vaccines, passive immunization, immunodeficiency disorder. ❖ structureofimmunoglobulin,typesandfunctions ofimmunoglobulins (IgG,IgA,IgM,IgD,IgE). ❖ Monoclonal Antibodies production and its applications. ❖ Hypersensitivity- types (I,II,III,IV). ❖ Understand various mechanism by which antibiotic destroys antigens ❖ Concept related to cells and organs related to immune system ❖ Immune response and immune mechanism ❖ Immunological disorders ❖ Concepts related to Immunodeficiency ❖ Demonstrate a comprehensive and practical understanding of basic immunological principles involved in research and clinical/applied science. ❖ Differentiate between humoral and cell mediated immunity and Learn about the different cells in immune system and their role in immunity. ❖ Understand the concept of antigens, antibodies and their in structures brief. ❖ Understand about the types of hypersensitivity and

	<p>autoimmunity.</p> <ul style="list-style-type: none"> ❖ Discuss current immunology news and issues
<p>Course: Sem VI Paper 7 : Introduction to Medical Microbiology</p>	<ul style="list-style-type: none"> ❖ Various concepts of medical microbiology ❖ Role of international organizations such as CDC and WHO ❖ Anatomy of human system ❖ Various chemotherapeutic agent and their mode of action Isolate and identify microorganism form laboratory sample, ❖ Antibiotics sensitivity and resistance test ❖ Detection of parasite ❖ Handling of blood and body fluids ❖ This interdisciplinary course teaches the students interactions between human and microbes, diseases caused by microbes. ❖ They learn about culture, collection, handling and transport of clinical samples ❖ They also learn about diagnosis of various microbial diseases ❖ At the end of the course students will be able to identify diseases and understand the treatment plan ❖ Understand the importance and the role of normal flora, diagnosis and treatment. ❖ Description , classification, structure, and pathogenesis of bacteria that infect humans. ❖ To understand the importance of pathogenic bacteria in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue and explain the methods of microorganisms control, e.g. chemotherapy & vaccines. Solve problems in the context of this understanding. ❖ Recall the relationship of this infection to symptoms, relapse and the accompanying pathology.
<p>Course: Sem VI Paper 7 : Diagnostic and Therapeutical Microbiology</p>	<ul style="list-style-type: none"> ❖ Course outcomes: By the end of this course, the students will be able to: ❖ Understand and explain the stages of infections diseases ❖ Describe various modes by which infections spread in community ❖ Describe various methods that can be adopted to control spread of infection in community ❖ Understand and explain various hospital borne, air borne and water-borne diseases ❖ Understand how to educate the people about taking care of health ❖ Isolate and identify microorganism form laboratory sample ❖ Perform MIC of antibiotics ❖ ELISA test for disease diagnosis ❖ Immuno-diffusion techniques
<p>Course: Sem VI Paper 7 : Medical Bacteriology, virology and parasitology</p>	<ul style="list-style-type: none"> ❖ To inculcate knowledge in relationship between human disease and micro organisms, pathogenicity, laboratory diagnosis and treatment methods ❖ This course is designed to impart knowledge on infectious disease epidemiology, investigating the outbreak and the role of public health laboratories in disease surveillance. ❖ The students are taught on the various infectious diseases, mode of transmission and different evaluation and control strategies. The students would also be able to appreciate behavioral changes in HIV patients, blood safety and immigrant health. ❖ The student at the end of the course will be able to gain knowledge about vaccination, screening of various diseases ❖ To inculcate It provides knowledge of pathogenic microorganisms, their characterization, pathogenesis and control ❖ Student can safeguard himself & society and can work diagnostics and hospitals

	<p>knowledge about virus, their role in causing disease Various viral disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxis</p> <ul style="list-style-type: none"> ❖ Various bacterial disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxis ❖ Various fungal disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxis ❖ Various protozoal disease, their causative agent, mode of infection, epidemiology, treatment, lab diagnosis, prophylaxis
<p>Course: Sem VI Paper 8: Food Microbiology</p>	<ul style="list-style-type: none"> ❖ Enable the student to get sufficient knowledge in relationship between food and microbes, techniques used in food processing. Primary Source of microbes in various foods ❖ Definition, general features and different products of milk ❖ Microbial analysis of milk ❖ Microbial production of fermented food viz. cheese, bread etcMilk microbiology- technique used in milk industry, ❖ Food microbiology – technique used in food industries, ❖ Microbial food poisoning Students in this course will learn about microbes in food, spoilage of food and preservation techniques of food. ❖ Through this course, they also learn about microbiology of milk, fermented diary products, industrially important microorganisms and process of industrial production of alcohol, beer, wine, SEP and mushrooms. ❖ At the end of the course, the student will be able to use the preservation techniques for food and use this experience to be employed as quality control Experts ❖ Understand the role microorganisms in food spoilage & to use predictive microbial growth programs with various food case studies to examine growth of foodborne pathogens and spoilage microbes. ❖ Understand theoretical background of functional micro-organisms (lactic acid bacteria, yeasts and molds), their behavior as fermentation starters, process engineering aspects of the formation of biomass and products, and of modern biotechnology in food fermentation. ❖ Understand the concept of food preservation and food poisoning. ❖ Understand microbial processes aimed to solve environmental problems.

MVS GOVT.ARTS AND SCIENCE DEGREE AND PG COLLEGE::MAHABUBNAGAR

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Bachelor of Science (B,Sc.)

DEPARTMENT OF ZOOLOGY

Program Outcomes, Program Specific Outcomes and Course Outcomes

Department of Zoology

Program Outcomes, Program Specific Outcomes and Course Outcomes of B.Sc. in Zoology

B. Sc. (Zoology) Programme

B.Sc. in Zoology is an undergraduate Program in Zoology. Zoology is the branch of science which deals with the study of animal kingdom including the evolution, structure, Physiology, classification, embryology, habits, habitat and distribution of all the animals. The B.Sc. Zoology course is premeditated to introduce students to the study of zoology at the organismal and organ function levels. The theoretical part of the program deals with the general principles of classical as well as modern zoology. The program provides the student with an introduction to the recent advances in zoology in the areas of systematic, evolution, reproduction, development, animal diversity, biochemistry, cytology and animal ecology. This course is offered for candidates who are interested in the study of animals. The minimum time required to complete the course is three years.

Objectives:

Imparting quality education in Zoology has been the focus of the department right from its inception. Emphasis is given on education both within and outside the classroom.

The Department is dedicated to fulfil the following objectives through the curricular and cocurricular activities:

- To provide students with knowledge of fundamental principles in zoology that will provide a foundation for their later advanced course in more specific biological subjects.
- To make students familiar with animal classification schemes and other applied courses as well as developing an understanding of and ability to apply basic zoological principles.
- To integrate the laboratory and lecture sections of the course and directed toward teaching students both in the classroom and on the field.
- To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology.
- To inculcate the value based education and entrepreneurial skills among the students.
- To create awareness on environmental issues through various activities.

Programme Outcomes

After successfully completing B. Sc. (Zoology) Programme students will be able to:

- P01.** Communicate scientific information through effective formal and informal methods generally used in sciences.
- P02.** Conduct basic scientific research and provide inputs for societal benefits.
- P03.** Develop competence in basic sciences and in the content of the specific courses that constitute the principal knowledge of their degree.
- P04.** Compare and contrast the characteristics of animals that differentiate them from other forms of life.
- P05.** Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.
- P06.** Understand and be aware of relevant theories, paradigms, concepts and principles of zoology.
- P07:** Understand the structure and functions of cell types
- P08:** Acquire time management and self-management skills.
- P09:** Relate the various abiotic factors with health of living forms and ecosystems.
- P010:** Explain the role of various biomolecules in living systems
- P011:** Apply the knowledge of Zoology to understand the complex life life Processes and phenomena.
- P012:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.

Programme Specific Outcomes :

- PSO1.** Ability to connect and apply biological knowledge to other disciplines and to integrate
- PSO2.** Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin., fossil records, Darwinism and Neo-Darwinism, experimental evidences.
- PSO3.** Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc
- PSO4.** Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.

Course Outcomes :

B. Sc. (Zoology) First Year

Sem & Paper	Course Outcomes (COs)
<p>Course: Sem I Paper 1</p> <p>Animal Diversity – Invertebrates</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand General characters and classification of Invertebrates From Protozoa to Echinodermata upto order levels with examples ➤ Explain and describe the Type study –Elphidium, Sycon ,Obelia, Schistosoma ,Dracunculus, Hirudinaria granulose, Prawn, Pila ➤ Understand Locomotion and Reproduction in Protozoa. ➤ Explain and describe the Epidemiology of Protozoan diseases - Amoebiasis; Giardiasis; Leishmaniasis and Malaria. ➤ Gain knowledge on General characters and classification of Porifera upto order levels with examples ➤ Understand the concept of Canal system in sponges and Spicules. ➤ Understand the concept of Polymorphism in Siphonophora

	<ul style="list-style-type: none"> ➤ The student has the basic knowledge on the Corals and coral reef formation ➤ Understand Parasitic Adaptations in Helminthes ➤ Explain and describe the Evolutionary significance of Coelome and Coelomoducts and metamerism ➤ Know various types of Crustacean larvae ➤ Gain knowledge on Insect metamorphosis ➤ Explain and describe the Peripatus -Structure and affinities ➤ The student has the basic knowledge on the Pearl formation ➤ Understand Torsion and detorsion in gastropods ➤ Explain Water vascular system in star fish ➤ Explain and describe the Echinoderm larvae and their significance
<p>Course: Sem II Paper 2</p> <p>Animal Diversity-Vertebrates</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Explain and describe the General characters ,classification and up to classes with examples of Hemichordata, Urochordata, Cephalochordata, Cyclostomata, Pisces ,Amphibia,Reptilia, Aves, Mammalia ➤ Explain and describe the Anotomy of (Digestive system,respiratory system,circulatotory system,nervous system) Scoliodon, Rana tigrina, Calotes, Columba livia, Rabbit. ➤ Explain Balanoglossus -Structure and affinities ➤ Understand Salient features of Urochordata ➤ Gain knowledge on Retrogressive metamorphosis and its significance in Urochordata ➤ Know Salient features and affinities of Cephalochordata ➤ The students will be able to Compare the Petromyzon and Myxine ➤ Understand different types of Scales and types of Fins in fishes ➤ Understand Parental care in amphibian; neoteny and paedogenesis ➤ Temporal fosse in reptiles and its evolutionary importance ➤ Compare Distinguished characters of Poisonous and Non poisonous snakes. ➤ Gain knowledge on Migration in Birds ➤ Gain knowledge on Flight adaptation in Birds ➤ Know Dentition in mammals. ➤ Explain Aquatic adaptatons in Mammals.

B. Sc. (Zoology) Second Year

Sem & Paper	Course Outcomes (COs)
<p>Course: Sem III Paper 3</p> <p>Animal Physiology, Animal Behaviour and Developmental Biology</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Define the basic terms in physiology. ➤ List the various types of digestive enzymes. ➤ Explain the physiological processes in mammals. ➤ Explain the anatomy of various systems. ➤ Illustrate the reproductive cycles with hormonal control. ➤ Diagrammatically represent the working of kidney. ➤ Justify the endocrine disorders. ➤ Types of Behavior:-Taxes, Reflexes, Tropisms, Instinctive and Motivated behavior. ➤ Physiology and phylogeny of learning:-Imprinting, habituation, ➤ Classical conditioning, Instrumental conditioning and trial and error ,learning. ➤ Social behavior, Communication, Pheromones ➤ Biological rhythms:-Types. ➤ Familiar with various stages involved in the developing embryo ➤ Apply the knowledge to collect various Biological data ➤ Understand the initial development al procedures involved in Amphioxus, frog and chick ➤ Familiar with types of placentaAbility to explain various Prenatal Diagnosis ➤ Familiarise with the principle of developmental biology ➤ Familiarise with various Techniques and tools of Embryology
<p>Course: Sem IV Paper 4</p> <p>Cell Biology, Genetics, Evolution and Zoogeography.</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Differentiate prokaryotic and Eukaryotic cells. ➤ Explain the principles of staining. ➤ Describe the structure and functions of cell organelles. ➤ Label the various cell parts and Cell organelles. ➤ Explain the cell division process and its significance. ➤ Explain Mendel's principle, its extension and chromosomal basis and determination of gene action from genotype to phenotype and concepts of inheritance. ➤ Define the terminologies in genetics. ➤ Describe the chromosome anomalies and associated diseases ➤ After successfully completing this course, students will be able to: ➤ Define organic evolution. ➤ Explain the theories of organic evolution. ➤ Describe the concept of origin of life and theories of origin of life. ➤ Struggle for existence; variation; and inheritance. ➤ Describe evolution of man. ➤ Illustrate the presence of organisms at various geological time scale. ➤ Apply the knowledge in relevant experimentations.

	<ul style="list-style-type: none"> ➤ Categorize different zoogeographical realms. ➤ Compare animal distribution in different zoogeographical realms.
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B. Sc. (Zoology) Third Year

Sem & Paper	Course Outcomes (COs)
<p>Course: Sem V Paper 5</p> <p>Physiological Chemistry/ Immunology / Diagnostic Methods of Parasites / Animal Biotechnology</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Define the basic terms in biochemistry. ➤ Explain the structure, functions and reactions of the various biomolecules. ➤ Give examples of each group type of biomolecules. ➤ Correlate the changes in the levels of these biomolecules with the diseases in human ➤ Calculate pH and pOH of buffer solution. ➤ Classify the biomolecules. ➤ Draw the structures of major biomolecules. Define the basic terms in parasitology. ➤ List common ectoparasites and endoparasites. ➤ Explain animal associations and their types. ➤ Discuss the life cycle and importance of major parasites. ➤ Illustrate transmission routes of animal and zoonotic parasites. ➤ Justify the control measures of arthropod vectors. ➤ Convince the importance of hygiene with respect to epidemic diseases. ➤ List the primary and secondary immune organs. ➤ Explain the concepts of immunity, self-nonsel immune response, autoimmune disease. ➤ Explain the theories of antibody synthesis and generation of antibody diversity. ➤ Explain the principle and application of the common techniques used in Immunology.

	<ul style="list-style-type: none"> ➤ Illustrate the events and dynamics of inflammation ➤ Compare the MHC molecules and diseases associated with HLA. ➤ Differentiate between active and passive immunization ➤ Define basic terminologies of metabolic pathways. ➤ Explain the laws of thermodynamics, concept of free energy and ATP as currency molecule. ➤ Describe the Concepts and regulation of metabolism. ➤ Discuss the oxidation of fatty acids and its significance. ➤ Illustrate the electron transport chain and oxidative phosphorylation. ➤ Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, ➤ TCA cycle, Purine and Pyrimidine metabolism ➤ Write the general reactions of various metabolic pathways. ➤ Justify the role of enzymes in metabolism ➤ Compare the three pathways of complement fixation pathway
<p>Course: Sem VI Paper 6</p> <p>Fisheries / Limnology / Vector Biology / Laboratory Animals Maintenance and Applications</p>	<p>After successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> ➤ Identify the fish diseases and the causative organisms. ➤ Mention the various composite fish culture with significance of each type. ➤ Describe the methods of freshwater prawn culture and its management. ➤ Explain the methods of pearl culture and pearl harvesting. ➤ Illustrate the preparation and management of fish culture ponds. ➤ Demonstrate the methods of packaging and transport of fish and brood fish. ➤ Illustrate techniques of fish harvesting, preservation & processing. ➤ Compare the techniques used in fishery development ➤ List the environmental challenges and their remedies. ➤ Describe the nature of ecosystem, productivity, food webs, energy flow, ➤ Describe the resilience of ecosystem and ecosystem management. ➤ Explain Biosphere, biomes and impact of climate on biomes. ➤ Explain wildlife management in India and conservation of wildlife. ➤ Explain the three necessary and sufficient conditions i.e ➤ Illustrate the toxic effects of chemicals in the environment on human and his livestock.

- Discuss natural resources, causes of their depletion and their conservation.
- Introduction to Insects ,General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts w.r.t.feeding habits
- Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity
- Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera
- Describe the Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis;Control of mosquitoes
- Describe the Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly
- Study of house fly as important mechanical vector, Myiasis, Control of house fly
- Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas
- Describe the Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases –Typhus fever, Relapsing fever, Trench fever, Vagabond’s disease, Phthiriasis; Control of human louse
- Describe the Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures .

MVS GOVT.DEGREE & PG COLLEGE (A)

MAHABUBNAGAR

**(Affiliated to Palamuru University, Accredited with NAAC" B" Grade
Christianpally, Mahabubnagar)**

*Programme Outcomes, Programme specific
outcomes and Course Outcomes*

Department of Urdu

Dr. Azmatullah

Head of the Department

Department of Urdu

Programme outcomes, Programme specific outcomes & Course out comes

The department of Urdu has been established in the year 1998. The student of Urdu medium elects the Urdu language as a Second language for first four semesters. All English medium students can also choose this subject as their Second language. The college has a language lab to horn student's communication proficiency. The department has been engaged in improving teaching methods and materials in consonance with the requirements of the fast-changing scenario of Urdu studies.

Globalization has brought effective communication skills to the forefront of academics, considering this the curriculum has been prepared by this college which has a Autonomous status with the collaboration of Osmania University, Hyderabad.

This syllabus is useful to the enhancement of writing skills, communication skills, and technical skills. There are 200 students are studying Urdu as a second language at UG level.

PROGRAMME OUTCOMES: -

- 1. On completion of the programme the students should have an ability to listen, read, comprehend, summarize and draw inferences.**
- 2. Should be able to write formal and Informal letters, applications and reports etc.**
- 3. Should develop and improve their communication skills such as they should be able to communicate their Ideas, suggestions, views and opinions clearly and logically.**
- 4. Should develop an ability to recognize text elements such as style, form, images, figure of speeches and annotations and references.**
- 5. Should be able to build vocabulary and knowledge of literary terminology.**
- 6. Should be able to apply different critical, theoretical and philosophical approaches to variety of stories, poems and essays.**

PROGRAMME SPECIFIC OUTCOMES:

- 1. Should develop an ability to write logically, clearly and effectively for a variety of professional and social settings.**
- 2. Student must develop an ability to understand and accept a composite view of multiculturalism.**
- 3. Students should improve the necessary communication skills (verbal & non- verbal) to meet the Global and local needs and enhance their employability.**
- 4. After the completion of four semesters as a second language they can join in Universities for higher studies like M.A, Urdu, B.Ed. and P.G in journalism and mass communication.**
- 5. On completion of the four semesters they can obtain Government and non- Government jobs like in teaching and telecommunication channels.**

SEM & PAPER COURSE OUTCOME

Course: Sem-I, Paper-I	<ul style="list-style-type: none">➤ Understand the contribution of classical Language (Deccani) in the development of Urdu language.➤ Contribution of Deccani poets in the Progress of Urdu.➤ On completion of the study the Ghazals of Qhuli Qutab Shah, Vali And Siraj the students will gain the Knowledge of History of Urdu Language and literature.➤ Students will able to understand reading, writing of Deccani.➤ After the completion of the Ghazals and Poems Students will able to differentiate the Deccani And Urdu.
Course: Sem-II, Paper-II	<ul style="list-style-type: none">➤ Students will understand the different forms of poems like Paband Nazm, Azad Namoarra nazm and Nasri Nazm etc.➤ After the completion of prose, they will able to differentiate the forms of prose.➤ On successful completion of all the aspects of the syllabus they know about classical and modern poets and writers.
Course: Sem-III, Paper-III	<ul style="list-style-type: none">➤ Progress of Masnavi (classical and modern).➤ Students will know the difference Between Masnavi and Marsiya.➤ The progress of Inshaaiya and letter Writing will help the students in Letter writing and essay writing skills.
Course: Sem-IV, Paper-IV	<ul style="list-style-type: none">➤ In depth study of Rubaaiyath and Qhatat will improve the personality and moral values.➤ On completion of the part of poems the multi-culturalism will develop in the students.➤ On completion of the fourth Sem Syllabus the students may join in Central and State Universities for the higher studies of Urdu literature and Journalism courses.

MVS GOVERNMENT ARTS & SCIENCE COLLEGE (A), MAHBUBNAGAR

DEPARTMENT OF BOTANY

B.Sc. Botany

Programme Outcomes

Knowledge and understanding of:

1. The range of plant diversity in terms of structure, function and environmental relationships.
2. The evaluation of plant diversity.
3. Plant classification and the flora of Telangana and India.
4. The role of plants in the functioning of the global ecosystem.
5. A selection of more specialized, optional topics.
6. Statistics as applied to biological data.

Intellectual skills – able to:

1. Think logically and organize tasks into a structured form.
2. Assimilate knowledge and ideas based on wide reading and through the internet.
3. Transfer of appropriate knowledge and methods from one topic to another within the subject.
4. Understand the evolving state of knowledge in a rapidly developing field.
5. Construct and test hypothesis.
6. Plan, conduct and write a report on an independent term project.

Practical skills:

Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their choice of optional modules.

1. Interpreting plant morphology and anatomy.
2. Plant identification.
3. Vegetation analysis techniques.

4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry.
5. Analyze data using appropriate statistical methods and computer packages.
6. Plant pathology to be added for sharing of field and lab data obtained.

1. Transferable skills:

1. Use of IT (word-processing, use of internet, statistical packages and databases).
2. Communication of scientific ideas in writing and orally.
3. Ability to work as part of a team.
4. Ability to use library resources.
5. Time management.
6. Career planning.

2. Scientific Knowledge

1. Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.

3. Problem Analysis

1. Identify the taxonomic position of plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification in Botany.

4. Design/development of solutions

1. Design solutions from medicinal plants for health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health

5. Conduct investigations of complex problems

1. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.

6. Modern tool usage

1. Create, select, and apply appropriate techniques, resources, and modern instruments and equipment for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture

experiments, cellular and physiological activities of plants with an understanding of the application and limitations.

7. The Botanist and society

Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

8. Environment and sustainability

Understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

9. Ethics:

Apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation.

10. Individual and team work

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

11. Communication

Communicate effectively on complex engineering activities with the engineering community and with 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.

12. Project management and finance

Demonstrate knowledge and understanding of the engineering 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.

13. Life-long learning

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.

MVS GOVERNMENT ARTS & SCIENCE COLLEGE (A), MAHBUBNAGAR

DEPARTMENT OF BOTANY

Course Outcomes of B.Sc. Botany

1. Critically evaluation of ideas and arguments by collection relevant information about the plants, so as to recognize the position of plant in the broad classification and phylogenetic level.
2. Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification.
3. Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy.
4. Students will be able to apply the scientific method to questions in botany by formulating testable hypotheses, collecting data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.
5. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.
6. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
7. Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations.
8. Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.
9. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history.
10. Students will be able to explain how Plants function at the level of the gene, genome, cell, tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants.

11. Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

12. Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology.

DEPARTMENT OF BOTANY

Programme Specific Outcomes: PSOs of B.Sc. Botany:

B.Sc. Part-I, Semester-I

Paper-I: Microbial Diversity and Lower Plants (BS 104)

Learning outcomes

- Develop understanding on the concept of microbial nutrition.
- Classify viruses based on their characteristics and structures.
- Develop critical understanding of plant diseases and their remediation.
- Examine the general characteristics of bacteria and their cell reproduction/ Recombination.
- Increase the awareness and appreciation of human friendly viruses, bacteria, alga and their economic importance.
- Conduct experiments using skills appropriate to subdivisions.
- Understand the diversity among Algae.
- Know the systematic, morphology and structure, of Algae.
- Understand the life cycle pattern of Algae.
- Understand the useful and harmful activities of Algae.
- Identify true fungi and demonstrate the principles and application of plant pathology in the control of plant disease.
- Demonstrate skills in laboratory, field and glasshouse work related to mycology and plant pathology.
- Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies.
- Identify the common plant diseases according to geographical locations and device control measures.
- Demonstrate an understanding of archegoniate, Bryophytes and Pteridophytes
- Develop critical understanding on morphology, anatomy and reproduction of Bryophytes and Pteridophytes.
- Understanding of plant evolution.
- Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes and Pteridophytes.

Semester II, Paper II: Gymnosperms, Taxonomy of Angiosperms and Ecology (BS 204)

Learning outcomes

- Demonstrate an understanding of Gymnosperms.
- Develop critical understanding on morphology, anatomy and reproduction of Gymnosperms
- Understanding of plant evolution and their transition to land habitat.
- Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Gymnosperms.
- Classify Plant systematics and recognize the importance of herbarium and Virtual herbarium. Evaluate the Important herbaria and botanical gardens.
- Interpret the rules of ICN in botanical nomenclature.
- Assess terms and concepts related to Phylogenetic Systematics.
- Generalize the characters of the families according to Bentham & Hooker's system of classification and study the economic importance of plants belonging to certain families.
- Understand core concepts of biotic and abiotic components of Ecosystem.
- Evaluate energy sources of ecological system.
- Assess the adaptation of plants in relation to light, temperature, water, wind and fire.
- Understand plant communities and ecological adaptations in plants.
- Conduct experiments using skills appropriate to subdivisions

Semester III,

Skill Enhancement Course 1: Nursery and Gardening (BS 301)

Learning outcomes

- Understand the process of sowing seeds in nursery
- List the various resources required for the development of nursery
- Distinguish among the different forms of sowing and growing plants
- Analyze the process of Vegetative propagation
- Appreciate the diversity of plants and selection of gardening
- Examine the cultivation of different vegetables and growth of plants in nursery and gardening. Identify and practice safe use of tools, equipment and supplies used in nursery and garden management careers.

Skill Enhancement Course 2: Biofertilizers and Organic Farming (BS 302)

Learning outcomes

- Develop their understanding on the concept of bio-fertilizer
- Identify the different forms of biofertilizers and their uses
- Compose the Green manuring and organic fertilizers
- Develop the integrated management for better crop production by using both nitrogenous and phosphate bio fertilizers and vesicular arbuscular mycorrhizal (VAM).
- Interpret and explain the components, patterns, and processes of bacteria for growth in crop production

Paper III: Plant Anatomy and Embryology (BS 304)

Learning outcomes

- Understand the scope & importance of Anatomy.
- Know various tissue systems.
- Understand the normal and anomalous secondary growth in plants and their causes.
- Perform the techniques in anatomy.
- With respect to recent knowledge students should know about the different tools in the taxonomy so as to relocate the phylogenetic position of plant or taxa.
- Understands the structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac.
- Understands the Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms.
- Develops critical understanding about endosperm types, structure and functions;
- Develops critical understanding about dicot and monocot embryo; Embryo-endosperm relationship Definition, types and Practical applications of apomixes and polyembryony.

Semester IV,

Skill Enhancement Course 3: Greenhouse Technology. (BS 401)

- Understand the basic concepts of greenhouse technology.
- Acquire knowledge on fertilizer application and irrigation systems in greenhouses.
- Get to know about pest management for greenhouse plants.

Skill Enhancement Course 4: Mushroom Culture Technology (BS 402)

Learning outcomes

- Recall various types and categories of mushrooms.
- Demonstrate various types of mushroom cultivating technologies.
- Examine various types of food technologies associated with mushroom industry.
- Value the economic factors associated with mushroom cultivation
- Device new methods and strategies to contribute to mushroom production.

Paper IV: Cell Biology, Genetics and Plant Physiology (BS 404)

Learning outcomes

After completion of the course, the students will be able to learn

- The eukaryotic cell cycle and mitotic and meiotic cell division.
- Structure and organization of cell membrane.
- Process of membrane transport and membrane models.
- Mendelian and Neo-mendelian genetics.
- Studies the phenomenon of dominance, laws of segregation, independent assortment of genes.
- Understand the different types of genetic interaction, incomplete dominance, codominance, interallelic genetic interactions, multiple alleles and quantitative inheritance etc.
- Know importance and scope of plant physiology.
- Understand the plants and plant cells in relation to water.
- Learn about the movement of sap and absorption of water in plant body.
- Learn structure and general features of enzymes.
- Understand the concept of enzyme activity and enzyme inhibition.

- Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
- Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic
- respiration, Glycolysis, Krebs Cycle and Electron Transport System.
- Understand the Nitrogen Metabolism in higher plants with particular emphasis on Biological Nitrogen Fixation, Amino Acid and Protein Synthesis.
- Understands the function and role of Growth Regulators and Inhibitors.
- Understand the plant movements.

Semester V

Generic Elective Course 1: Industrial Microbiology (BS 501)

Learning outcomes

- Understand concepts of industrial microbiology
- Apply the usage of microorganisms in industry
- Measure the growth of microorganisms
- Analyze the use of microbes in industries such as dairy and medicines
- Explain the concept of fermentation
- Understand the use of patent with respect to industrial microbiology

Paper V: (BS 502)

Biodiversity & conservation (DSE - 1A)

Learning outcomes

- Understand the morphological diversity of Bryophytes and Pteridophytes and Gymnosperms.
- Understand the economic importance of the Bryophytes and Pteridophytes and Gymnosperms.
- Know the evolution of Bryophytes and Pteridophytes and Gymnosperms.
- Understand the habit of the angiosperm plant body.
- Know the vegetative characteristics of the plant.
- Learn about the reproductive characteristics of the plant.
- Understand the plant morphology and basic taxonomy.

Economic Botany (DSE – 1B)

- Understand core concepts of Economic Botany and relate with environment, populations, communities, and ecosystems.
- Develop critical understanding on the evolution of concept of organization of apex new crops/varieties, importance of germplasm diversity, issues related to access and ownership.
- Develop a basic knowledge of taxonomic diversity and important families of useful plants.
- Increase the awareness and appreciation of plants & plant products encountered in everyday life.
- Appreciate the diversity of plants and the plant products in human use.

Seed Technology (DSE – 1C)

- Understand the theoretical orientation of seed development.
- Analyze the different ways of seed processing in different plants.
- Examine the various methods of Seed testing.
- Understand the method of seed production in different plants.
- Explain the concept of hybrid seed production.

Semester VI, Paper VI:

DSE – 3: Project (BS 601)

DSE - 2A: Plant Molecular Biology (BS 602)

Learning outcomes

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

- Analyze the structures and chemical properties of DNA and RNA through various historic experiments.
- Differentiate the main types of prokaryotes through their grouping abilities and their characteristic.
- Evaluate the experiments establishing central dogma and genetic code.
- Gain an understanding of various steps in transcription, protein synthesis and protein modification.

DSE – 2B: Tissue Culture and Biotechnology (BS 602)

Learning outcomes

- Understands the invitro methods in plant tissue culture.
- Learn the aseptic techniques, the media used and the use of growth regulators.
- Understand the technique of micropropagation.
- Learn the in-vitro method of production of secondary metabolites.
- Study about ovary, ovule, anther, embryo and endosperm cultures and their applications.
- Learn organogenesis and somatic embryogenesis.
- Study soma clonal variations and their significance.
- Learn about protoplast culture, its isolation, regeneration.
- Learn viability tests of protoplasts.
- Understand somatic hybridization and cybridization.
- Learn about transgenic plants.
- Understand agrobacterium mediated gene transfer in plants.
- Learn the applications of transgenic plants.
- Study the role of plant tissue culture in agriculture, horticulture and forestry.
- Study different types of DNA
- Study different types of RNA DNA replication
- Study the different enzymes used in replication
- Understand the mechanism of replication DNA repair
- Study about genetic code, properties of genetic code, Transcription in prokaryotes and eukaryotes
- Learn the mechanism of transcription in prokaryotes and eukaryotes
- Understand the concept of promoters, transcription factors.
- Learn post transcriptional modifications in eukaryotes Translation
- Understand the mechanism of translation in prokaryotes and eukaryotes
- Learn about translational enzymes and factors Regulation of gene expression
- Learn operon concept.
- Study lac operons.

DSE – 2C: Analytical Techniques in Plant Sciences (BS 602)

Learning outcomes

- Develop conceptual understanding of cell wall degradation enzymes and cell fractionation.
- Classify different types of chromatography techniques.
- Explain the principles of Light microscopy, compound microscopy, Fluorescence microscopy and confocal microscopy.
- Apply suitable strategies in data collections and disseminating research findings.

MVS GOVT.DEGREE COLLEGE(A), MAHABUBNAGAR

Department of computer Science

Programme Outcome (B.Sc with Computer Science)

Computer Science (CS) has been evolving as an important branch of science and engineering throughout the world in last few decades Computer science is a discipline that spans theory and practical. Now a days, practically everyone is a computer user, and many people are even computer programmers. The ever-evolving discipline of computer science also has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers,

Computer science has a wide range of specialties. These include Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Computational Science, and Software Engineering.

Computer Science education at undergraduate level (+3) will result in earning a Bachelor of Science (BSc) degree in CS. The coursework required to earn a BSc is equally weighted in mathematics and science. BSc in CS are aimed at undergraduate level training facilitating multiple career paths. Students so graduated, can take up postgraduate programmes in CS leading to research as well as R&D, can be employable at IT industries, or can adopt a business management career. BSc with CS aims at laying a strong foundation of CS at an early stage of the career along with two other subjects such as Physics, Maths, Electronics, Statistics etc. There are several employment opportunities and after successful completion of an undergraduate programme in CS, graduating students can fetch employment directly in companies as Web Developer, Software Engineer, Network Administrator, Data Scientist, or AI/ML personnel.

- To develop an understanding and knowledge of the basic theory of Computer Science and Information Technology with good foundation on theory, systems and applications such as algorithms, data structures, data handling, data communication and computation.
- To develop the ability to use this knowledge to analyse new situations
- To acquire necessary and state-of-the-art skills to take up industry challenges. The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.
- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems

Programme Specific Outcome (B.Sc with Computer Science)

1. Fundamental understanding of the principles of Computer Science and its connections with other disciplines
2. Procedural knowledge that creates different types of professionals related to Computer Science, including research and development, teaching and industry, government and public service;
3. Skills and tools in areas related to computer science and current developments in the academic field of study.
4. Use knowledge, understanding and skills required for identifying problems and issues, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources, and their application, analysis and evaluation using methodologies as appropriate to Computer Science for formulating solutions
5. Communicate the results of studies undertaken in Computer Science accurately in a range of different contexts using the main concepts, constructs and techniques
6. Meet one's own learning needs, drawing on a range of current research and development work and professional materials
7. Apply Computer Science knowledge and transferable skills to new/unfamiliar contexts,

Course Outcomes

PROGRAMMING IN C AND C++

1. Learn to develop simple algorithms and flow charts to solve a problem.
2. Develop problem solving skills coupled with top down design principles.
3. Learn about the strategies of writing efficient and well-structured computer algorithms/programs.
4. Develop the skills for formulating iterative solutions to a problem.
5. Learn array processing algorithms coupled with iterative methods.
6. Learn text and string processing efficient algorithms.
7. Learn searching techniques and use of pointers.
8. Understand recursive techniques in programming.

DATA STRUCTURES

1. To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
2. To have a knowledge of complexity of basic operations like insert, delete, search on these data structures.
3. Ability to choose a data structure to suitably model any data used in computer applications.
4. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
5. Ability to assess efficiency tradeoffs among different data structure implementations.
6. Implement and know the applications of algorithms for sorting, pattern matching etc.

OPERATING SYSTEM

1. Describe the important computer system resources and the role of operating system in their management policies and algorithms.
2. To understand various functions, structures and history of operating systems and should be able to specify objectives of modern operating systems and describe how operating systems have evolved over time.
3. Understanding of design issues associated with operating systems.
4. Understand various process management concepts including scheduling, synchronization, and deadlocks.
5. To have a basic knowledge about multithreading.
6. To understand concepts of memory management including virtual memory.
7. To understand issues related to file system interface and implementation, disk management.
8. To understand and identify potential threats to operating systems and the security features design to guard against them.
9. To have sound knowledge of various types of operating systems including Unix and Android.

COMPUTER NETWORKS

1. Understand the structure of Data Communications System and its components. Be familiarize with different network terminologies.
2. Familiarize with contemporary issues in network technologies.
3. Know the layered model approach explained in OSI and TCP/IP network models
4. Identify different types of network devices and their functions within a network.
5. Learn basic routing mechanisms, IP addressing scheme and internetworking concepts.
6. Familiarize with IP and TCP Internet protocols.
7. To understand major concepts involved in design of WAN, LAN and wireless networks.
8. Learn basics of network configuration and maintenance.
9. Know the fundamentals of network security issues.

SOFTWARE ENGINEERING

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Ability to apply software engineering principles and techniques.
3. To produce efficient, reliable, robust and cost-effective software solutions.
4. Ability to work as an effective member or leader of software engineering teams.
5. To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.

DATABASE MANAGEMENT SYSTEMS

1. Gain knowledge of database systems and database management systems software.
2. Ability to model data in applications using conceptual modelling tools such as ER Diagrams and design data base schemas based on the model.
3. Formulate, using SQL, solutions to a broad range of query and data update problems.

4. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
5. Be acquainted with the basics of transaction processing and concurrency control.
6. Familiarity with database storage structures and access techniques.
7. Compare, contrast and analyse the various emerging technologies for database systems such as NoSQL.
8. Analyse strengths and weaknesses of the applications of database technologies to various subject areas.

OBJECT ORIENTED PROGRAMMING

1. Learn the concepts of data, abstraction and encapsulation
2. Be able to write programs using classes and objects, packages.
3. Understand conceptually principles of Inheritance and Polymorphism and their use and program level implementation.
4. Learn exception and basic event handling mechanisms in a program
5. To learn typical object-oriented constructs of specific object oriented programming language

WEB TECHNOLOGIES

1. To understand the terms related to the Internet and how the Internet is changing the world.
2. To understand how computers are connected to the Internet and demonstrate the ability to use the World Wide Web.
3. Demonstrate an understanding of and the ability to use electronic mail and other internet based services
4. Understand the design principles of Web pages and how they are created
5. To develop an ability to create basic Web pages with HTML.

PROGRAMMING IN JAVA

1. Knowledge of the structure and model of the Java programming language,
2. Use the Java programming language for various programming technologies
3. Develop software in the Java programming language,
4. Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements

PYTHON PROGRAMMING

1. Develop and Execute simple Python programs.
2. Structure a Python program into functions.
3. Using Python lists, tuples to represent compound data
4. Develop Python Programs for file processing

MVS Government Degree & PG College, Mahabubnagar
Department of Chemistry
Programme outcome & Programme Specific Outcomes

Programme outcome

The purpose of the undergraduate chemistry programme at MVS government Arts & Science Degree College(A) is to provide the key knowledge and laboratory resources to prepare students for careers as professionals in the field of chemistry, for graduate & post graduate study in chemistry, biological chemistry and related fields, and for professional programmes including medical, dental & pharmaceuticals.

Programme Specific Outcomes

- Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in General, Inorganic, Organic and Physical Chemistries.
- 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 skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
- Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.
- Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
- Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
- Students will be able to explain why chemistry is an integral activity for addressing social, economic, and environmental problems.
- Students will be able to function as a member of an interdisciplinary problem solving team.

Semester – I

Unit-I (Inorganic Chemistry)

Chemical Bonding and P-Block Elements

Course outcome

To impart students a broad outline of the methodology of science in general and Chemistry in particular. The students will learn the important analytical and instrumental tools used for practicing chemistry.

To develop interest among students in various branches of inorganic chemistry. To impart essential theoretical knowledge on atomic structure, periodic properties, chemical bonding, and Compounds of P-block elements.

Unit-II (Organic Chemistry).

Structural theory in Organic Chemistry, Acyclic Hydrocarbons and Aromatic Hydrocarbons

Course outcomes

To impart the students a thorough knowledge about the chemistry of some selected functional groups (Alkanes, Alkenes, Alkynes) with a view to develop proper aptitude towards the study of organic compounds and their reactions. To enable the students to understand and study Organic reaction mechanisms. Also about Aromaticity, Chemical reactions which involves in Aromatic compounds and Poly nuclear Hydrocarbons.

Unit-III (Physical chemistry)

Atomic Structure

Course outcomes

Student able to understand the fundamental particles of atom and structural properties of atom through classical mechanism, Compton Effect, De Broglie hypothesis.

Gaseous state and liquid state

Course outcomes

To get an overview about the structure and properties of Gaseous state and liquid state, crystals and liquid crystals.

Solutions

Course outcomes

Instill the knowledge about liquid mixture how then can be prepared, properties, obeying rules and separation of liquids from its mixture with diagram.

Unit-IV (General Chemistry)

General principle of Inorganic Qualitative Analysis

Course outcomes

To impart skill to students in the systematic qualitative analysis of mixtures containing Salt mixture with one interfering radical(ion) by semi-micro method.

Solid state

Course outcomes

To get an overview about the structure and properties of of solid crystals and liquid crystals by means of Crystallography. To know the characterisation of crystals using X-Ray diffraction and defects in solids.

Laboratory Courses (practical)

Course outcomes

Qualitative analysis – Semi-micro analysis of salt mixture

To impart the students a thorough knowledge of Systematic qualitative analysis of salt mixture to identify two cations and two anions with interfering radical by Semi- micro method.

Semester – II

Unit-I (Inorganic Chemistry)

Chemistry of P- block elements-II

Course outcomes

Student familiarized with Types of Oxides, Oxyoxides, Inter halogens, Poly halides, Pseudo halogens, about its nature, structure and reactivity,

Chemistry of Zero group Elements

Course outcomes

Student canUnderstood the concept of Isolation of Nobel gases, Structure, bonding and reactivity of Xenon compounds.

Chemistry of d- elements

Course outcomes

To understood the general characteristics of the d and f block elements. To give the students a thorough knowledge of the different theories to explain the bonding in coordination compounds.

To enable the students to understand the electronic configuration, different oxidation state by a metal ion, Magnetic and color (spectra) propertirs and Applications of metal ions in various fields.

Unit-II(Organic Chemistry)

Halogen Compounds

Course outcomes

Student can understood the Classification, Preparations, Physical and Chemical properties of Halides and the concept of reactivity order of various halides.

Hydroxy Compounds and Ethers

Course outcomes

Student can understood the Classification, Preparations, Physical and Chemical properties of Halides and the concept of reactivity order of various alcohols.

Student can understood the concept of Acidic character of phenols
Classification, Preparations, Physical and Chemical properties of Phenols and the concept of reactivity order of various substituted Phenols.

Carbonyl Compounds

Course outcomes

Student can understood the concept of Tautomerism, reactivity order of various

aldehydes and ketones, Classification, Preparations, Physical and Chemical properties of carbonyl compounds and some important named reactions and applications of it in Pharmaceuticals.

Unit-III (Physical Chemistry)

Electrochemistry

Course outcomes

Student able to understand the concept of Conductance, types of electrolytes, measurements of conductance and effect of dilution on conductance.

Theories of electrolyte disassociation, Transport number and its determination, Applications of conductance, calculation of p^{ka} of acids and determination of solubility product.

Also about Electrolytic and Galvanic cells, calculation of EMF of cell, classification of electrodes, and relationship between emf and thermodynamic quantities.

Unit-IV (General Chemistry)

Theory of Quantitative analysis

Volumetric Analysis

Course outcome

To develop skills for quantitative estimation using the different branches of volumetric Analysis and Gravimetric Analysis.

Laboratory Courses (practical)

To develop skill for Quantitative analysis of substance in given solution via Different types of Volumetric analysis Methods such as Acid-Base titration, Redox titration and Complex metric titration.

Semester – III

Unit-I (Inorganic Chemistry)

Chemistry of f-block Elements

Course outcomes

To enable the students to understand the electronic configuration, different oxidation state by a metal ion, Magnetic and color (spectra) properties and Applications of metal ions in various fields. Knew the structure and bonding theories of coordination compounds To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure. To get an overview about the Structural and stereochemistry of coordination compounds

Metal Carbonyls and Organo Metallic Compounds

Course Out Comes

Student can understand Preparations, Properties of metal Carbonyl compounds. Also the Classification, Nomenclature, Methods of Preparations of Organometallic compounds and Applications of Alkyl and Aryl compounds of Li, Mg @ Al.

Unit-II(Organic Chemistry)

Carboxylic acids and its derivatives

Course outcomes

Student can understand the concept of Acidic character of **Carboxylic acids** Classification, Preparations, Physical and Chemical properties of Phenols and the concept of reactivity order of various substituted **Carboxylic acids**

Nitro hydroCarbons

Course outcomes

Student can understand the concept of Acidic character of **Nitro alkanes, Tautomerism**, Classification, Preparations, Physical and Chemical properties of Phenols and the concept of reactivity order of various substituted **Nitro hydro carbons**.

Amines, Cyanides and Iso Cyanides

Course outcomes

Student can understand the concept of Acidic character of Amines, Cyanides and Iso Cyanides Tautomerism, Classification, Preparations, Physical and Chemical properties of Phenols and the concept of reactivity order of various substituted Amines, Cyanides and Iso Cyanide

Unit-III (Physical Chemistry)

Thermodynamics I @ II

Course outcomes

- To know the Terminology, basic concepts in classical thermodynamics and to learn the thermodynamic aspects of various processes and reactions To understand the different aspects of statistical thermodynamics and its applications.
- The relationship between microscopic properties of molecules with macroscopic thermodynamic observables.
- The application of mathematical tools to calculate thermodynamic properties.

Unit-IV (General Chemistry)

Evaluation of analytical data

Course Out comes

Student learnt about Accuracy and Precision, Errors encounter during experiments and classification.

Carbanion-I

Course Out comes

Student able to understand the acidic nature of α -hydrogen and its application in various non-conventional reactions.

Phase Rule

Course Out comes

Student can learn about concept of phase rule and phase diagram, one and two component systems. Phase diagram application in metallurgy.

Laboratory Courses (practical)

Synthesis of Organic Compounds

Course Out comes

To gain the skill to prepare organic compounds using green protocols. Enable the students to prepare organic compounds.

Semester – IV

Unit-I (Inorganic Chemistry)

Coordination Compounds -II

Course outcomes

Student study about CFT, CFSE in Octahedral compounds and also about determination of composition of coordination compound along with chemical, solubility, color p^h , conductivity, magnetic susceptibility.

Students have overall view about HSAB principle, its applications and applications of coordination compounds in Qualitative analysis, in Medicine as toxic removers and in cancer treatment, in polymer chemistry as catalyst and in water softening.

Bio-inorganic Chemistry

Course outcomes

Student understand the essentiality of elements, its role, application and deficiency in physiology.

Unit-II(Organic Chemistry)

Carbohydrates

Course outcomes

Students have an overall view about classification, Nomenclature, Optical Isomers, Configuration and Structural elucidation of glucose and fructose. Along with Conversion of Monosaccharaides,how health, disease, and modern medicine are all rooted in biological chemistry

Amine Acids- Proteins

Course outcomes

Students learn and apply the knowledge aboutthe classification, preparations, physical and chemical properties and role of amino acids in the synthesis and functions of proteins, enzymes.

Hetero Cyclic Compounds

Course outcomes

Students learn and apply the knowledge about the classification, Aromaticity, preparations, physical and chemical properties and role of heterocyclic compoundsas a starting material in the synthesis of medicines.

Unit-III (Physical Chemistry)

Chemical Kinetics

Course outcomes

Student able to understand the types of chemical reaction, Terminology (rate of reaction, order, molecularityetc.), Influencing factors on rate of reaction, derivation of various order of reactions, order and molecularity of various chemical reactions, order determination methods and effect of temperature on rate of reaction(Arrhenius equation).

Photochemistry

Course outcomes

Students learn about the difference between the photochemical and thermal reaction, laws of Photo chemistry, Quantum yield, Jablonski diagram.

Unit-IV (General Chemistry)

Theories of Bonding in Metals

Course outcomes

Student gain the knowledge about bonding theories in metals, Conductivity of metals and types of semiconductors and its propertirs and applications.

Carbanions-II

Course outcomes

Students have brief information of some important Synthetic reactions, Synthetic applications of EAA and Di EtheyMelanoate.

Colloids and Surface Chemistry

Course outcomes

Students learn and realize the Classification, preparations, purifications and properties, role and importance of colloids and Emulsons.

Students learn about types, influencing factors and various adsorption isotherms and also Applications.

Laboratory Courses (practical)

Qualitative Analysis of Organic Compounds

The students get training for systematic qualitative analysis of simple organic compounds.

Semester – V

Unit-I (Inorganic Chemistry)

Coordination Compounds -II

Course outcomes

Student study about CFT,CFSE in Octahedral compounds and also about determination of composition of coordination compound along with chemical , solubility, color p^h , conductivity, magnetic susceptibility.

Students have overall view about HSAB principle, its applications and applications of coordination compounds in Qualitative analysis,in Medicine as toxic removers and in cancer treatment, in polymer chemistry as catalyst and in water softing.

Boranes and Carboranes

Course outcomes

Student understands and learn about the Classification and Structure of boranes and carboranes.

Unit-II(Organic Chemistry)

Amines, Cyanides and Iso Cyanides

Course outcomes

Student can understand the concept of Acidic character of Amines, Cyanides and Iso Cyanides Tautomerism, Classification, Preparations, Physical (basicity) and Chemical properties, Identification or separation and the concept of reactivity order of various substituted Amines, Cyanides and IsoCyanides.

Hetero Cyclic Compounds

Course outcomes

Students learn and apply the knowledge about the classification, Aromaticity, preparations, physical and chemical properties and role of heterocyclic compounds as a starting material in the synthesis of medicines.

Unit-III (Physical Chemistry)

Chemical Kinetics

Course outcomes

Student able to understand the types of chemical reaction, Terminology (rate of reaction, order, molecularity etc.), Influencing factors on rate of reaction, derivation of various order of reactions, order and molecularity of various chemical reactions, order determination methods and effect of temperature on rate of reaction(Arrhenius equation).

Unit-IV (General Chemistry)

Molecular Spectroscopy

Course outcomes To know the basic principle of different techniques employed in molecular Spectroscopy. To study the origin, instrumentation and important applications of Microwave, IR and UV techniques.

Photochemistry

Course outcomes

Students learn about the difference between the photochemical and thermal reaction, laws of Photo chemistry, Quantum yield, Jablonski diagram.

Laboratory Courses (practical)

Synthesis of Organic chemistry practical

To gain the skill to prepare organic compounds using green protocols. Enable the students to prepare organic compounds.

Thin layer Chromatography

To learn the separation and purification of an organic mixture by TLC separation methods,

Semester – V (paper-VI)

(Elective-A)

Unit-I @ II

Chromatography-I @ II

Course outcomes

Student came to know the principle and Methods of Solvent Extraction, Working principle, the role, Composition and Nature (including selection) of Stationary Phase and Mobile Phase.

Classification of Chromatography on the basis of Stationary Phase and Mobile Phase.

Preparation of TLC Plate, Development of Chromatogram, Imparting color to Chromatogram, Identification of Solvent front and Solute (component), Calculation of R_f-value and Application of TLC, Column, Paper, GLC, HPLC and FTIR.

Unit-III

Colorimetry and Spectrophotometry

Course outcomes

Students familiarize with Absorption Laws (Beer's and Lambert's) and Terminology.

Working Model, Types, Principle and differences between Colorimeter and Spectrophotometer.

Applications of Spectrophotometer in Analytical Chemistry and Pathology.

Unit-IV

Electro-analytical Methods

Course outcomes

Students familiarize with Working Principle of Potentiometry.

Construction of Electrochemical Cell, Types of Electrodes, Calculation of EMF of the Cell at various concentrations.

Working model and principle to Voltametry.

Conductivity, Conductivity Cell, Types of Conductance, Effect of dilution on various conductance and Mathematical calculation of conductivity.

Laboratory Courses (practical)

To verify the some important principles in physical chemistry and to determine various physical properties.

Semester – VI (Core Paper-VII)

Unit-I (Inorganic Chemistry)

Inorganic reaction mechanism

Course outcomes

To acquaint knowledge on Labile and Inert Complexes, Stability in terms of Thermodynamic and Kinetic stability, Types and mechanism of Ligand substitution reactions.

Bio-Inorganic Chemistry

Course outcomes

Student can acquaint knowledge on Biological significance of Elements, Role and Function of elements in Physiological changes.

Hard and Soft acid-base (HSAB)

Course outcomes

Students understand Pearson's Concept of Hardness and Softness, Its Principle and Applications along with feasibility of reaction with examples.

Unit-II (organic Chemistry)

Carbohydrates

Course outcomes

Can acquaint concept of Classification of carbohydrates, Nomenclature, Stereo Isomers, Structural elucidation of Glucose, Fructose and Chemical Properties.
Also know the Inter Conversion reactions on Monosaccharide's.

Amine Acids @ Proteins

Course outcomes

Students learn and apply the knowledge about the classification, preparations, physical and chemical properties and role of amino acids in the synthesis and functions of proteins, enzymes.

Unit-III (Physical Chemistry)

Thermodynamics-I

Course outcomes

- To know the Terminology, basic concepts in classical thermodynamics and to learn the thermodynamic aspects of various processes and reactions
- To understand the different aspects of statistical thermodynamics and its applications.
- The relationship between microscopic properties of molecules with macroscopic thermodynamic observables.
- The application of mathematical tools to calculate thermodynamic properties

Unit-IV (General Chemistry)

Molecular Spectroscopy

Course outcomes To know the basic principle of different techniques employed in molecular Spectroscopy

To study the origin, instrumentation and important applications in the Interpretation of Structure and Chemical formula given compound by PMR and Mass Spectrometry.

Thermodynamics-II

Course outcomes

Student can be familiarized with the Concept of Entropy, Carnot's Cycle, Types of processes, Entropy change in various processes and Concept and Applications of Free Energy.

Laboratory Courses (practical)

Identification of Organic compounds by Qualitative Analysis and Spectral Analysis.

Semester – VI (paper-VIII) (Elective-B)

Unit-I

Pesticides

Course outcomes

Students understand the Concept of Definition, Classification, Preparation, Chemical structures and Applications along with its impact on Environmental Pollution. Also learnt about Pesticides formulation and Bio-Pesticides.

Unit-II

Fertilizers

Course outcomes

Students can acquaint knowledge about Definition, Classification, Preparation, Chemical structures and Applications along with its impact on Environmental Pollution. Also learnt about Pesticides formulation and Bio-Fertilizers and Organic farming.

Unit-III**Energy sources and Coal****Course outcomes**

Student gain knowledge on types of energy sources, Classification of Fuels and their Calorific value, Usage of Coal as fuel, Carbonation of Coal resultant gases such as producers and water gas and Fractionation of Coal.

Unit-IV**Petroleum, Petrochemical Industry and Lubricants****Course outcomes**

Students understand the concept of Composition of Crude Petroleum, Refining and Different types of Petroleum products and its applications.

Enable the student to get understand the Fractional distillation of Crude and obtaining different fractions of different physical properties, The process of Artificial synthesis of petrol by Cracking (Thermal and Catalytic), Reforming of Petroleum and Non Petroleum gases and Bio-gases derived from bio-mass.

Enable the students to get understand about Classification, Properties and functions, Determination of properties of Lubricant oils, Semi and solid Lubricants also about Synthetic Lubricants.

Laboratory Courses (practical)

The determination of various physical properties like Rate of reaction by Kinetics, Redox potential by Potentiometry. Concentration of acid by P^H metry and Saponification of EAA by Conducometry.

MVS.GOVERNMENT DEGREE AND P.G. COLLEGE (A)
MAHABUB NAGAR
DEPARTMENT OF HINDI
HINDI SUBJECT FOR ALL U.G. COURSES

I. Program Outcomes

Student seeking admission for B.A/B.COM./B.Sc./B.B.A programme with second language as **Hindi** is expected to motivate with following qualities which helps them in their future life to achieve the expected Goals.

- a. Communication Skills
 - b. To know the history of Hindi language and literature
 - c. Creative ability.
 - d. Responsible and dutiful citizen.
-

II. Program Specific Outcomes.

On completion of U.G.Course with second Language as a Hindi, Students are able to:

1. To understand the basic concept and subject of Hindi & its origin
 2. To make or not the importance of subject Hindi & its Branches.
 3. To understand various aspect of Hindi literature with a process to reach method and giving new mode and direction.
 4. To make an attempt in different areas and theory such as vocabulary and vice versa
 5. To understand the Literature in a broader way as they may confined to subject.
 6. To know about Hindi literature its roots cause perspectives and methods.
 7. Elaborating and understanding its philosophical methods of Hindi Literature.
 8. Evaluating the concept of Hindi from past to present and making the society more closely through literature.
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III. Course outcomes

Class: FIRST YEAR U.G. SEMESTER-I

GADHYA DARPAN (Prose):

On completion of this course, students are able

1. to understand importance of good character in the life through “Charitra Sanghatan by Babu Gulabrai”.
2. To understand the relationship between the market and human values through “Baajar Darshan by Jainendra Kumar”.
3. To understand about the life of young widow and her feelings through “Bhabi by Mahadevi Varma”.
4. To understand the Cultural unity and History of Ancient India through “Bharat mein Sanskriti Sangam by Ramdhari Singh Dinkar”.
5. To understand Unity and Integrity of India through “Rashtra Ka Swaroop by Vaasudev Sharan Agrwal”.

KATHA SINDHU (Short Stories):

On completion of this course, students are able

1. To understand Social Discriminations in Indian Society before Independence through the Short Story “Sadgati by Premchand”
 2. To understand how a son of freedom fighter tries to save his ill-health mother by performing some magic shows to get some money through “Chota Jaadoogar by Jay Shankar Prasad”.
 3. To understand how a person tries to protect the honesty through “Sachch ka Souda by Sudarshan”.
 4. To understand the satire on Superstitious believes in Society through “Praayaschit by Bhagavati Charan Varma”.
 5. To understand how Curtian protects the values and integrity of a house hold through “Pardah by Yash Pal”.
 6. To understand the behaviour of a middle class person towards the elders in home through “Cheif ki Daawat by Bheeshm Sahaani”.
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Class: FIRST YEAR U.G. SEMESTER-II

GADHYA DARPAN (Prose):

On completion of this course, students are able

1. To understand the beauty of Kashmir Sceneries through “Dharati Ka Swarg by Vishnu Prabhakar”.
2. To understand relationships in Joint Family in between elders and younger ones through “Tayee by Vishwambhar Nath Sharma Koushik”.
3. To understand Satire on Selfish Politics through “Raaj Neeti Ka Batvaara by Hari Shankar Parsayee”.
4. To understand the life history of Swami Vivekananda through “Swami Vivekananda by Vamshidhar Vidyalankar”.
5. To understand environmental problems and solutions through “Paryavaran Aur Hum by Rajeev Garg”.

KATHA SINDHU (Short Stories):

On completion of this course, students are able

1. To understand the bravery of woman through “Gadal by Raangeya Raaghav”.
2. To understand about the Selfish people in the society through “Hasun ya Roun by Vinayak Rao Vidyalankar”.
3. To understand how a retired person is neglected by his own family through “Vaapasi by Usha Priyamvada”.
4. To understand how old aged persons are neglected by their own children through “Seva by Mamata Kaaliya”.
5. To understand how a suppressed caste girl determines and becomes a social worker through “Siliya by Susheela Takhbore”.

VYAKARAN (Grammar)

On completion of this course, students are able to understand

1. “Sandhi Vichched”
 2. “ Vilom Shabdh (Antonyms)”
 3. “Patra Lekhan (Letter Writing)”
- for better language Skills.
-

Class: SECOND YEAR U.G. SEMESTER-III

KAVYA NIDHI (Poetry):

On completion of this course, students are able

1. To understand Human Values and better Society through “Kabir ke Dohe by Kabir das”.
2. To understand Honesty, High Values and truth through “Tulsi Ke Dohe by Tulsi Das”.
3. To understand inculcation of optimism in youth through “Nava Yuvakon Se by Mythili Sharan Gupt”.
4. To understand the Difficulties and Comforts of Human Life through “Phool aur Kanta by Ayodhya Singh Upadhyay Hariaudh”.
5. To understand the bravery of King Bharata in his childhood through “Bharat by Jaishankar Prasad”.
6. To understand how the poetess describes about her childhood through “Mera Naya Bachpan by Subadra Kumari Chauhan”.

HINDI SAHITYA KA ITIHAAS (History of Hindi Literature)

On completion of this course, students are able

1. To understand the socio - cultural and political circumstances and features of “Adi Kaal”, the first era of Hindi Literature.
2. To understand the socio - cultural and political circumstances and features of “Bhakti Kaal”, the second era of Hindi Literature.

3. To understand a short biographies of following writers

1. Chandbardai
2. Kabir
3. Tulsi Das
4. Soor Das
5. Bharatendu Harishchandra
6. Mythili Sharan Gupta
7. Jai Shankar Prasad
8. Sumitra Nandan Panth
9. Ramdari Singh Dinkar

VYAKARAN (Grammar)

On completion of this course, students are able to understand

1. Nibandh (Essay)
 2. Anuvaad (Translation)
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Class: SECOND YEAR U.G. SEMESTER-IV

KAVYA NIDHI (Poetry):

On completion of this course, students are able

1. To understand Human Values and better Society through “Rahim ke Dohe by Rahim”.
2. To understand Honesty, High Values and truth through “Bihari Ke Dohe by Bihari Lal”.
3. To understand the importance of Gautama Budhdha in this present scenario through “Bhagavan Budhdha ke prati by Surya Kanth tripathi Nirala”.
4. To understand the mysticism, advaitavada and optimism through “Ve Muskate Phool Nahi by Mahadevi Varma”.
5. To understand the importance of pen and sword according to time through “Kalam Aur Talvaar by Ramdhari Singh Dinkar”.
6. To understand how poet motivates us to move forward without break through “Tu kyun Bait gaya hai path Par by Harivansh Rai Bachchan”.

HINDI SAHITYA KA ITIHAAS (History of Hindi Literature)

On completion of the course, students are able

1. To understand the socio - cultural and political circumstances and features of “Riti Kaal (Shringar Kaal)”, the third era of Hindi Literature.
2. To understand the socio - cultural and political circumstances and features of “Aadhunik Kaal”, the fourth era of Hindi Literature.
3. To understand a short biographies of following writers

1. Meera Bai
2. Bihari
3. Raheem
4. Mahaveer Prasad Dwivedi
5. Suryakanth Tripathi Nirala
6. Mahadevi Varma
7. Harivamsha Rai Bachchan
8. Agyey
9. Premchand

VYAKARAN (Grammar)

On completion of this course, students are able to understand

1. Nibandh (Essay)
2. BodhGamyā Gadhyamsh (Comprehension)

DR.K.Narsimha Rao
Asst Professor
Dept of Hindi

M.V.S GOVT. ARTS & SCINCES COLLAGE (AUTOMOUS)
MAHABOORNAGAR , TELANGANA
(NAAC WITH B GRADE)
FACULTY OF ECONOMICS

Offering Programmers

B.A

I. Program Outcome of Bachelor of Arts (B.A.)

Student seeking admission for B.A. programme are expected to imbue with following quality which help them in their future life to achieve the expected goals.

- a. Realization of human values.
- b. Sense of social service.
- c. Responsible and dutiful citizen.
- d. Critical temper
- e. Creative ability.

ECONOMICS

Programme Specific Outcomes of Economics

- Understanding how different degrees of competition in a market affect pricing and output.
- Understanding the efficiency and equity implications of market interference, including government policy.
- Developing research knowledge in economics.
- Developing the skill of data collection & use of sampling techniques in research.
- Developing the knowledge about theories of economic growth & Development and issues of economic planning.
- Creating awareness about changing macro-economic policies and theories.

Course Outcomes of Economics

B.A.-I Micro Economics

- Knowing the decision making of consumer. Identifying the nature of revenue and cost of production.
- Comprehending the demand function and production function.
- Realizing various production theories.
- Clarifying the meaning of Marginal, average, total revenue, and Marginal, average and total cost and its implication.
- Awareness of different markets structure.
- Understanding pricing in different markets.
- Judging the factor pricing.

B.A.-II Macro Economics

- Identifying the basic concepts and theories of Macro economics.
- Awareness about changing macro economics policies and theories.
- Understanding various concepts such as; GDP, GNP NNP, Personal Income, Disposable Income, Per Capita Income, and National Income.
- Identifying the factors determining gross domestic product, employment, the general level of prices, and interest rates.
- Realizing the law of markets, consumption function and investment function.
- Judging the role of fiscal policy and monetary policy in a Developing economy.
- Knowing features, phases and theories of trade cycles.
- Evaluating types, merits and demerits of taxes.
- Comprehending the role of public finance in developing economy.

III Indian Economy

- Understanding characteristics, features, structural changes in Indian Economy.
- Comprehension of the nature and impact of New Economic Reforms on the Indian Economy.
- Knowing the problems of unemployment, poverty, rising economic and social inequality and problems of regional imbalances in India.
- Evaluating the changing role of agriculture, industrial and service sector and foreign sector in Indian Economy.
- Measuring the problems and prospects of cottage and small scale industries, and industrial sicknesses.
- Measuring the growth, volume, composition and direction of India's foreign trade and capital inflow since 1991.

B.A-III Economics of Development

- Understanding the concept and aspects of economic Development.
- Knowing the theories of economic growth & Development.
- Measuring the concept and issues of economic planning.
- Discussing the need, types and necessary conditions of economic planning.

B.A.-III International Economics

- Elaborating the importance of the study of International Economics.
- Finding similarities and dissimilarities in inter-regional and international trade.
- Knowing the changes in the import-export policies of India.
- Evaluating various types of exchange rates and its merits and demerits.
- Discussing the types and effects of tariffs and quotas.
- Judging the function, merits and demerits of Foreign Capital, and International Corporation (IMF, IBRD, WTO and SAARC).
- Realizing the volume, composition and direction of Balance of trade and Balance of payments.

BA-III INDUSTRIAL ECONOMICS

Industrial Economics is the study of firms, industries, and markets. It looks at firms of all sizes – from local corner shops to multinational giants such as WalMart or Tesco. And it considers a whole range of industries, such as electricity generation, car production, and restaurants.

When analysing decision making at the levels of the individual firm and industry, Industrial Economics helps us understand such issues as:

- the levels at which capacity, output, and prices are set;
- the extent that products are differentiated from each other;
- how much firms invest in research and development (R•&D)
- how and why firms advertise

Industrial Economics also gives insights into how firms organise their activities, as well as considering their motivation. In many micro courses, profit maximisation is taken as given, but many industrial economics courses examine alternative objectives, such as trying to grow market share. There is also an international dimension – firms have the option to source inputs (or outsource production) overseas. As such, while industrial economics more frequently uses skills and knowledge from micro courses, macroeconomic concepts are sometimes employed