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Sarada Vilas Educational Institutions (R)

SARADA VILAS COLLEGE

Krishnamurthypuram, Mysuru - 570 004
(Affiliated to the University of Mysore)
Reaccredited by NAAC with B+grade (CGPA : 2.70)
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Sl. No.	Enclosures	Page No.
1	Programme outcomes and course outcomes	2-32

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PROGRAMME OUTCOMES AND COURSE OUTCOMES
(2022-2023)
DEPARTMENT OF PHYSICS

The new national education policy (NEP) has extended a vast exposure in various branches of student's interest. One can choose the subject of his/her interest and will get one major subject with one minor subject. A student has the option to complete the four-year course with his/her own time. She/he can drop out from the course in between the four years.
Students can get a certificate after one year program.

- An advanced diploma after two years.
- A bachelor's degree after three years.
- A bachelor's degree with research after four years.

This is a boon for the students who are worried about losing a year of academics. The outcome of the course makes the student eligible for various jobs in different fields.

PROGRAM OUTCOMES

- PO-1: Discipline Knowledge: Knowledge of science and ability to apply to relevant areas.
- PO-2: Problem solving: Execute a solution process using first principles of science to solve problems related to respective discipline.
- PO-3: Modern tool usage: Use a modern scientific, engineering and IT tool or technique for solving problems in the areas of their discipline.
- PO-4: Ethics: Apply the professional ethics and norms in respective discipline.
- PO-5: Individual and teamwork: Work effectively as an individual as a team member in a multidisciplinary team.
- PO-6: Communication: Communicate effectively with the stake holders, and give and receive clear instructions.

LEARNING OUTCOMES / COURSE OUTCOMES

- CO-1: Will learn fixing units, tabulation of observations, and analysis of data (graphical/analytical).
- CO-2: Will learn about accuracy of measurement and sources of errors, importance of significant figures.
- CO-3: Will know how g can be determined experimentally and derive satisfaction.
- CO-4: Will see the difference between simple and torsional pendulum and their use in the determination of various physical parameters.
- CO-5: Will come to know how various elastic moduli can be determined.
- CO-6: Will measure surface tension and viscosity and appreciate the methods adopted.
- CO-7: Will get hands on experience of different equipment.
- CO-8. Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- CO-9. Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.
- CO-10. Apply Gauss's law of electrostatics to solve a variety of problems.

- CO-11. Describe the magnetic field produced by magnetic dipoles and electric currents.
- CO-12. Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.
- CO-13. Describe how magnetism is produced and list examples where its effects are observed.
- CO-14. Apply Kirchhoff's rules to analyse AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.
- CO-15. Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,
- CO-16. Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.
- CO-17 Critical thinking, Reflective thinking, Analytical reasoning, Scientific reasoning
- CO-18. Problem-solving
- CO-19. Research-related skills
- CO-20. Cooperation/ Teamwork/ Leadership readiness/Qualities
- CO-21. Information/ Digital literacy/Modern Tool Usage
- CO-22 Environment and Sustainability
- CO-23 Multicultural competence
- CO-24 multi-disciplinary
- CO-25 Moral and ethical awareness/Reasoning
- CO-26 Lifelong learning / Self Directed Learning

CBCS pattern.

Obtaining a degree in physics, helps students to gain knowledge in handling electrical circuits and components. They gain knowledge related to the fields of electricity and solutions to problems faced with the same. Physics has a great impact on the young minds, because it is related to mathematics, computer science, chemistry and also biology. Students of physics usually have a queries mind of gaining knowledge. The students obtain basic knowledge in mechanics, light, optics, electricity, magnetism, properties of matter, nuclear physics, solid state physics. This helps them to take one of the specializations in the post-graduation level. Physics provides the students with knowledge needed in the industry, education, research, or public administration and higher education.

HIGHER EDUCATION

- B.Ed.
- M.Sc.
- Take CSIR/NET/GATE for Ph.D./M.Phil.

CAREER PROSPECTS

- Lecturer in PUC colleges
- Assistant professor in first grade colleges
- Any competitive examination like IAS, KAS.

DEPARTMENT OF CHEMISTRY

PROGRAM OUTCOMES

- PO. 1: To create enthusiasm among students for chemistry and its application in various fields of life.
- PO. 2: To provide students with broad and balanced knowledge and understanding of key concepts in chemistry.
- PO. 3: To develop in students a range of practical skills so that they can understand and assess risks and work safely measures to be followed in the laboratory.
- PO. 4: To develop in students the ability to apply standard methodology to the solution of problems in chemistry.
- PO. 5: To provide students with knowledge and skill towards employment or higher education in Analytical chemistry or multi-disciplinary areas involving chemistry.
- PO.6: To provide students with the ability to plan and carryout experiments independently and assess the significance of outcomes and to cater to the demands of chemical Industries of well-trained graduates.
- PO. 7: To develop in students the ability to adapt and apply methodology to the solution of unfamiliar types of problems.
- PO. 8: To install critical awareness of advances at the forefront of chemical sciences, to prepare students effectively for professional employment or research.

LEARNING OUTCOMES / COURSE OUTCOMES

- CO-1. The concepts of chemical analysis, accuracy, precision and statistical data treatment.
- CO-2. Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
- CO-3. Describe the dual nature of radiation and matter; dual behavior of matter and radiation, de Broglie's equations, Heisenberg uncertainty principle and their related problems.
- CO-4. Quantum mechanics. Derivation of Schrodinger's wave equation. Radial and angular Orbital shapes of s, p, d and f atomic orbitals, nodal planes. Electronic configurations of the atoms.
- CO-5. Pauli's exclusion principle, Hund's rule, Aufbau's principle and its limitation.
- CO-6. The concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming
- CO-7. The Concept of aromaticity, resonance, hyper conjugation, etc.
- CO-8. Explain bond properties, electron displacement effects (inductive effect, electrometric effect, resonance effect and Hyper conjugation effect). steric effect and their applications in explaining acidic strength of carboxylic acids, basicity of amines.
- CO-9. Understand basic concept of organic reaction mechanism, types of organic reactions.
- CO-10. Understand the preparation and reactions of alkanes.
- CO-11. Understand the stability and conformational analysis of cycloalkanes.
- CO-12. Understand the concept of resonance, aromaticity and anti-aromaticity.
- CO-13. Describe relative strength of aliphatic and aromatic carboxylic acids.

- CO-14. Explain the existence of different states of matter in terms of balance between intermolecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gases and real gases. Understand cooling effect of gas on adiabatic expansion
- CO-15. Understand the conditions required for liquefaction of gases. Realize that there is continuity in gaseous and liquid state.
- CO-16. Understand the properties of liquids in terms of intermolecular attractions.
- CO-17. Understand the existence of different states of matter in terms of balance 17 between intermolecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gases and real gases. Understand cooling effect of gas on adiabatic expansion
- CO-18. Understand the conditions required for liquefaction of gases. Realize that there is continuity in gaseous and liquid state.
- CO-19. Understand the properties of liquids in terms of intermolecular attractions.
- CO-20. Understand the chemical reactions involved in the detection of cations and anions.
- CO-21. Explain basic principles involved in classification of ions into groups in semi-micro qualitative analysis of salt mixture
- CO-22. Carryout the separation of cations into groups and understand the concept of common ion effect.
- CO-23. Understand the choice of group reagents used in the analysis.
- CO-24. Analyze a simple inorganic salt mixture containing two anions and cations
- CO-25. Use instruments like conductivity meter to obtain various physicochemical parameters.
- CO-26. Apply the theory about chemical kinetics and determine the velocity constants of various reactions. 8. Learn about the reaction mechanisms
- CO-27. Interpret the behavior of interfaces, the phenomena of physisorption and chemisorption's and their applications in chemical and industrial processes.
- CO-28. Learn to fit experimental data with theoretical models and interpret the data
- Understand the importance of fundamental law and validation parameters in chemical analysis
- CO-29. Know how different analytes in different matrices (water and real samples) can be determined by spectrophotometric, nephelometric and turbidimetric methods.
- CO-30. Explain the importance of Stereochemistry in predicting the structure and property of organic molecules.
- CO-31. Predict the configuration of an organic molecule and able to designate it. Page | 6
- CO-32. Identify the chiral molecules and predict its actual configuration. 6. Write the M.O. energy diagrams for simple molecules
- CO-33. Differentiate bonding in metals from their compounds.
- CO-34. Learn important laws of thermodynamics and their applications to various thermodynamic systems.
- CO-35. Understand adsorption processes and their mechanisms and the function and purpose of a catalyst
- CO-36. Apply adsorption as a versatile method for waste water purification

After completion of the B.Sc. course in CHEMISTRY, the students –

- Can get into pharma-based industries
- Can opt for courses like M.Sc. / MBA
- Can get into chemical industries
- Can get into clinical/ health care industries
- Can work in cosmetics /perfume industry
- Explore his/her career in forensic laboratories
- Can pursue their career in the field of teaching
- Can work as an analytical chemist in water purification firms
- Can get into food processing industries
- Can engage in ceramic/ paper industry
- Can work as an environmental specialist
- Can work as a scientific data entry specialist
- Can work as a lab assistant
- Can get into agrochemical industries
- Can work as a medical data entry operator
- Can work in textile industries
- Can work as a research associate in nuclear/thermal power plant firms
- Can get into quality control unit of milk processing firms

DEPARTMENT OF MATHEMATICS

PROGRAM OUTCOMES

- PO 1 Disciplinary Knowledge: Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also leads to study the related areas such as computer science and other allied subjects.
- PO 2 Communication Skills: Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. The skills and knowledge gained in this program will lead to the proficiency in analytical reasoning which can be used for modelling and solving of real-life problems.
- PO 3 Critical thinking and analytical reasoning: The students undergoing this program acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing the various aspects of real-life problems.
- PO 4 Problem Solving: The Mathematical knowledge gained by the students through this program develop an ability to analyse the problems, identify and define appropriate computing requirements for its solutions. This program enhances students' overall development and also equip them with mathematical modelling ability, problem solving skills.
- PO 5 Research related skills: The completing this program develop the capability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics.
- PO 6 Information/digital Literacy: The completion of this program will enable the learner to use appropriate software to solve system of algebraic equation and differential equations.

- PO 7 Self – directed learning: The student completing this program will develop an ability of working independently and to make an in-depth study of various notions of Mathematics.
- PO 8 Moral and ethical awareness/reasoning: The student completing this program will develop an ability to identify unethical behavior such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life in general and Mathematical studies in particular.
- PO 9 Lifelong learning: This program provides self-directed learning and lifelong learning skills. This program helps the learner to think independently and develop algorithms and computational skills for solving real word problems.
- PO 10 Ability to peruse advanced studies and research in pure and applied Mathematical sciences.

LEARNING OUTCOMES / COURSE OUTCOMES

- Learn to solve system of linear equations.
- Solve the system of homogeneous and non -homogeneous linear of m equations in n variables by using concept of rank of matrix.
- Students will be familiar with the techniques of integration and differentiation of function with real variables.
- Students learn to solve polynomial equations.
- Learn to apply Reduction formulae.
- Learn free and open-source software (FOSS) tools for computing programming
- Solve problem on algebra and calculus theory studied in MATDSCT 1.1 by using FOSS software's.
- Acquire knowledge of applications of algebra and calculus through FOSS
- Learn to solve system of linear equations.
- Solve the system of homogeneous and non-homogeneous m linear equations by using the concept of rank of matrix.
- Students will be familiar with the techniques of differentiation of function with real variables.
- Identify and apply the intermediate value theorems and L'Hospital rule.
- Learn to apply Reduction formulae. Learn the concept of Divisibility.
- Learn about prime and composite numbers.
- Learn the concept of congruences and its applications.
- Identify and apply the intermediate value theorems and L'Hospital rule.
- Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- Find the extreme values of functions of two variables.
- Students learn to find areas and volumes using integration.
- Enhance learning in Algebra and Differential Equations.
- Apply the concepts of algebra in practical problems.
- Solve various differential equations of practical interest.

Opportunities for Higher Education:

- After the completion of program, student may opt for
- B.Ed. course
- M.Sc. in Mathematics (Both pure and applied)
- M. Math. Course in ISI (Indian Statistical Institute)
- MS in Mathematics abroad
- M.Sc. in Actuarial science
- M.Sc. in Mathematical computation and Finance

Career/Job opportunities

- Teaching sector (Assistant/Associate/Professor)
- Research Career (After Ph.D. in Mathematics)
- Actuary or risk assessor in the insurance industry or finance firms
- Banking sector
- Scientist/Engineer post at ISRO, DRDO.

DEPARTMENT OF COMPUTER SCIENCE
PROGRAM OUTCOMES: B.Sc.

- Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
- Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
- Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems.
- Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day scientific applications.
- Application Systems Knowledge: Possessing a minimum knowledge to practice existing computer application software.
- Communication: Must have a reasonably good communication knowledge both in oral and writing.
- Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
- Lifelong Learning: Should become an independent learner. So, learn to learn ability.
- Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

LEARNING OUTCOMES / COURSE OUTCOMES

- Understand working of Hardware and Software and the importance of operating systems.
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.
- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given problem.
- Perform input and output operations using programs in C.

- Write programs that perform operations on arrays, strings, structures, unions and functions.
- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
- Demonstrate different methods for traversing trees.
- Compare alternative implementations of data structures with respect to performance.
- Describe the concept of recursion, give examples of its use.
- Discuss the computational efficiency of the principal algorithms for sorting and searching.
- Explain the object-oriented concepts and JAVA.
- Write JAVA programs using OOP concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.
- Implement Classes and multithreading using JAVA.
- Demonstrate the basic principles of creating Java applications with GUI.
- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

Higher Studies:

- Eligible to pursue M.Sc., in Cs, M.Sc. -IT, MCA, MBA, MS, CA, LLB and
- B.Ed.,
- Can admit to PG Diploma Courses and Advanced Diploma Course.

Career Visions:

- B.Sc., Computer Science Jobs in India
- Graduates of B.Sc. Computer Science can find jobs in a variety of sectors like IT departments, MNCs, Colleges, Banks, Entrepreneurship, Medical Representative, etc. in both Private Companies and Government Sectors [Central, State and PSUs].
- The B.Sc., Computer Science Colleges in India offers placement opportunities in the field of Software development, Website development, Mobile App development, Software Testing, Online Tutoring, Games development, and Other IT related Jobs.
- After clearing a selection test like UGC NET or GATE or some other national level exam, you can become a researcher as well and get employed in various research institutes [ISRO, CFTRI] across the country.

PROGRAM OUTCOME
B.Sc. (Hon's) Data Science and Artificial Intelligence

- The four years Bachelors in Computer Science (Hons) program enables students to attain the following additional attributes besides the afore-mentioned attributes:
- Apply standard Software Engineering practices and strategies in real -time software project development
- Design and develop computer programs/computer-based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
- Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
- The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
- The ability to work independently on a substantial software project and as an effective team member.

LEARNING OUTCOMES / COURSE OUTCOMES

B.Sc. (Hon's) Data Science and Artificial Intelligence

- Understand working of Hardware and Software and the importance of operating systems
- Understand Programming languages, number systems, peripheral devices, and networking, multimedia and internet concepts.
- Write the C code for a given problem
- Preform input and output operations using program in c
- Write programs that perform operations on arrays, strings, structures, unions and files
- Understand fundamental operating system abstractions such as processes, threads, files.
- Analyze important algorithms eg. Process scheduling and memory management algorithms.
- Categorize the operating system's resource management techniques, dead lock management techniques, memory management.
- Describe how arrays, records, linked structures, stacks, queues, trees and graphs are represented in memory and used by algorithms.
- Describe common applications for arrays, records, linked structures, stacks, queues, trees and graphs Write programs that use arrays, records, linked structures, stacks, queues, trees and graphs Demonstrate different methods for traversing trees Describe the concepts of recursion, give examples of its use.
- Understand Big Data and its analytics in the real world.
- Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analyst. c) Big Data Analysis with Machine Learning.
- Analyze worst-case running times of algorithms using asymptotic analysis
- Apply important algorithmic design paradigms and methods of analysis.
- Argue the correctness of algorithms using inductive proofs and invariants
- Develop a understanding and familiarity with various types of cyber-attacks , cybercrimes, vulnerabilities and remedies thereto.

- Analyse and evaluate existing legal framework and laws on cyber security.
- Analyse and evaluate the digital payment system security and remedial measures against digital payment frauds.
- Understand Big Data and its analytics in the real world. Analyse the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analyst. Big Data Analysis with Machine Learning.
- Demonstrate the concepts of control structures in Python.
- Implement Python programs using functions and strings.
- Implement methods to create and manipulate lists, tuples and dictionaries.
- Apply the concepts of file handling. Basic neuron Models. Network Models Basic Learning Algorithms and Applications
- aIllustrate the concepts of Database Management System.
- Apply Relational Model concepts, Constraints and Design
- Illustrate the Transactional Database Concepts, Scheduled, Lock Management and Recovery.
- Illustrate transaction management system in DBMS
- Define software engineering process and translate a requirements specification into high level and low-level designs.
- Explain software development techniques to develop applications
- Apply verification and validation techniques and estimate software cost.
- construct linear programming models and discuss solution techniques; set-up decision models and propose best strategy using decision-making methods under uncertainty and game theory.
- understand overview of Big Data, i.e. storage, retrieval and processing of big data. In addition, it also focuses on the "technologies", i.e., the tools/algorithms that are available for storage, processing of Big Data. a) Understand Big Data and its analytics in the real world. b) Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analyst. c) Big Data Analysis with Machine Learning
- Explain the basic concepts in the design of deep neural networks
- Apply the concepts of deep neural networks in formulating solutions to complex machine learning problems.
- Illustrate parameter tuning for deep learning architecture
- Illustrate the various aspects of natural language generation
- Develop applications for NLP using machine learning algorithms.
- Design finite state transducers for Language Processing
- To establish a broad and comprehensive understanding of the domain by the students in preparing them to participate in the production of highly integrative immersive applications, immersive social platforms, cross- disciplinary research projects and leading developments in industry applications.
- To build data mining applications using statistical analysis techniques. Explain the basic concepts and techniques of Data Mining. Analyse Associate rules to solve the problem. Apply statistical analysis techniques. Evaluate advanced data mining techniques

- To inculcate in students the knowledge of principals of fuzzy logic models of Artificial neural networks and their application to design and manufacturing sectors. The field of Robotics is a multi-disciplinary as robots are amazingly complex system comprising
- mechanical, electrical, electronic H/W and S/W and issues germane to all these.
- Explain basic concepts and techniques of image processing. Develop skills of using image processing for solving practical problems Analyze various image segmentation and feature extraction techniques

Higher Studies:

- M.Sc. Software Engineering
- M.Sc. Data Analytics
- Master of Science
- Cyber Security
- Master of Computer Application
- Statistics

Career Opportunities- This course is highly popular among students in India and Abroad because of its increasingly high demand and diverse future scope in tech-companies, consultancies, market research companies and energy sector.

- Data Scientist
- Business Analyst
- Data Analyst
- Data Engineer
- Data Architect
- Business Intelligence Analysts
- Data Mining Engineer
- Data Solutions Analyst
- Research Analyst
- Business Intelligence Analyst
- Machine Learning Engineer
- Analytics Manager and many more

DEPARTMENT OF BOTANY

PROGRAM OUTCOMES

By the end of the program the students will be able to:

- Skill development for the proper description using botanical terms, identification, naming and classification of life forms especially plants and microbes.
- Acquisition of knowledge on structure, life cycle and life processes that exist among plant and microbial diversity through certain model organism studies.
- Understanding of various interactions that exist among plants and microbes; to develop the curiosity on the dynamicity of nature.
- Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

- Ability to explain the diversity and evolution based on the empirical evidences in morphology, anatomy, embryology, physiology, biochemistry, molecular biology and life history.
- Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.
- Making aware of the scientific and technological advancements- Information and Communication, Biotechnology and Molecular Biology for further learning and research in all branches of Botany.
- Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.
- To enable the graduates to prepare for national as well as international level competitive examinations like UGC-CSIR, UPSC, KPSC etc.
- To enable the students for practicing the best teaching pedagogy as a biology teacher including the latest digital modules.
- The graduates should be knowledgeable and competent enough to appropriately deliver on aspects of global importance like climate change, SDGs, green technologies etc. at the right opportunity.
- The graduate should be able to demonstrate sufficient proficiency in the hands-on experimental techniques for their area of specialization within biology during research and in the professional career.

LEARNING OUTCOMES / COURSE OUTCOMES

- Understand the fascinating diversity, evolution, and significance of microorganisms.
- Comprehend the systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment.
- Gain laboratory skills such as microscopy, microbial cultures, staining, identification, preservation of microbes for their applications in research and industry.
- Understand the diversity and affinities among Algae, Bryophytes, Pteridophytes and Gymnosperms.
- Understand the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes, Pteridophytes and Gymnosperms, and their ecological and evolutionary significance.
- Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.
- Skill development for the proper description of internal structure using botanical terms, their identification and further classification.
- Understanding the basic concepts in plant morphogenesis, embryology and organ development. Understanding the fundamental concepts in ecology, environmental science and phytogeography.
- Concept development in conservation, global ecological crisis, Sustainable development and pros and cons of human intervention.

- Enable the student to appreciate bio diversity and the importance of various conservation strategies, laws and regulatory authorities and global issues related to climate change and sustainable development.
- Ability to identify, classify and describe the plants in scientific terms. Identification of plants using dichotomous keys.
- Recognition, processing and utilization of economically important plants.
- Skill development in processing of biomass and plant products as source of food, healthcare, energy and natural products.
- Identify the basic principles and current trends in classical genetics and Cell biology.
- Recognize the historical process of the evolution of molecular genetics from classical genetics.
- Develop theoretical background on molecular genetics to provide a strong support for the student for future research and employability. Preliminary understanding of the basic functions and intermediary metabolism in a plant body.
- Awareness on the interdisciplinary nature of botany, chemistry and physics by studying the principles of plant life, growth and reproduction.
- Recognizing the wonderful mechanism of transport and the Interrelationships existing between metabolic pathways thereby gaining and idea about the importance of plants in the dynamicity of nature.
- Learning of knowledge & skill in plant tissue culture, plant molecular biology and transgenic.
- Application of plant biotechnology in plant genomics, phylogenetic studies and metabolic engineering.
- Understanding of new molecular techniques in cell and metabolic manipulations.
- Understanding the mechanism and concepts of life process at molecular level through central dogma concept.
- Skill acquiring in the basic molecular biology techniques & characterization of micro molecules.
- Acquiring the emerging technology skills in plant genetic engineering & proteomics. Understanding the seed structure and related functions, seed health and productivity.
- Technology for assessing the seed pathology, purity, and preservation.
- Learning the field and laboratory protocols of seed production, certification and quality.
- Understanding & learning common diseases & control measures of plant diseases.
- Acquiring skills in plant disease diagnosis, control & management through IPM.
- Learning of new skills in health clinic through biological methods.
- Knowledge of Indian system of medicine with regard to medicinal plants.
- Acquiring skills in identification, cultivation and preservation of medicinal plants.
- Isolation, identification, characteristics of active principles in medicinal plants & drug formulations.
- Learning of basic principles of application, ICT Technology in biological studies & research.

- Acquiring skill to utilize the computational apps, active data basis and tools in analysis in genetics & proteomics.
- Learning skills and software used for biological research & process understanding.
- Observation of variations that exists in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.
- Skill development for the proper description of internal structure of using botanical terms, their identification and further classification.
- Induction of the enthusiasm on internal structure of locally available plants.
- Understanding various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.
- Observation and classification of the floral variations from the premises of college and house.
- Understanding the various reproductive methods and substages in the life cycle of plants.
- Observation and classification of the embryological variations in angiosperms.
- Enthusiasm to understand evolution based on the variations in reproduction among plants.
- Understanding the fundamental concepts in ecology, environmental science and phytogeography.
- Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.

Higher Education

- Masters in Botany
- Masters in Biotechnology
- Masters in Genetics
- Masters in Molecular Biology
- Masters in Biosciences
- Masters in Environmental Science
- Masters in Wild life
- Masters in Forestry
- B.Ed. with Biology
- Ph. D. in Botany

Career Opportunities

- Teaching profession in Schools, Colleges and Universities
- Jobs in Research and Development centers
- Jobs in Herbal drug industries
- Jobs in Pharmaceutical industries
- Jobs in Pollution control board
- Jobs in Indian Forest Services
- Jobs in Botanical Survey of India
- Jobs or Research in National Parks and Wild Life Sanctuaries
- Jobs or Self-employment in Agriculture, Horticultural and Floriculture sectors
- Self-employment through Mushroom cultivation

DEPARTMENT OF ZOOLOGY

PROGRAM OUTCOMES

- POs1-TheProgramoffersbothclassicalas well as modern concepts of Zoology in higher education.
- POs2-It enables the students to study animal diversity in both local and global environments.
- POs3-Tomakethestudy of animals more interesting and relevant to human studies more emphasis is given to branches like behavioral biology, evolutionary biology and economic zoology.
- POs4-More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have been also included.
- POs5-Equal importance is given to practical learning and presentation skills of students.
- POs6-The lab courses provide the students necessary skills required for their employability.
- POs7-Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students.
- POs8-The global practices in terms of academic standards and evaluation strategies.
- POs9- Provides opportunity for the mobility of the student both within and across the world.
- POs 10-The uniform grading system will benefit the students to move across institutions within India to begin with and across countries.
- POs11-It will also enable potential employers in assessing the performance of the candidates across the world.

LEARNING OUTCOMES / COURSE OUTCOMES

At the end of the course the student should be able to understand:

- The structure and function of the cell organelles.
- The chromatin structure and its location.
- The basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form a new organism.
- How a cell communicates with its neighboring cells.
- The principles of inheritance, Mendel's laws and the deviations.
- How environment plays an important role by interacting with genetic factors.
- Detect chromosomal aberrations in humans and study of pedigree analysis.
- To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates.
- How simple molecules together form complex macromolecules.
- To understand the thermodynamics of enzyme catalyzed reactions.
- Mechanisms of energy production at cellular and molecular levels.
- To understand various functional components of an organism.
- To explore the complex network of these functional components.
- To comprehend the regulatory mechanisms for maintenance of function in the body.

- After successful accomplishment of the course, the learners will be able to acquire better understanding and comprehensive knowledge regarding most of the essential aspects of Molecular Biology subject which in turn will provide a fantastic opportunity to develop professional skill related to the field of molecular biology.
- The course will mainly focus on the study of principal molecular events of cell incorporating DNA Replication, Transcription and Translation in prokaryotic as well as eukaryotic organisms.
- Acquiring knowledge on instrumentation and techniques in biology.
- Acquaint knowledge on versatile tools and techniques employed in genetic engineering and recombinant DNA technology.
- An understanding on application of genetic engineering techniques in basic and applied experimental biology.
- To acquire a fundamental working knowledge of the basic principles of immunology.
- To understand how these principles, apply to the process of immune function.
- Use, and interpret results of, the principal methods of statistical inference and design; helps to communicate the results of statistical analyses accurately and effectively; helps in usage of appropriate tool of statistical software.
- knowledge regarding most of the essential aspects of the Molecular Biology subject
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- Acquaint knowledge on versatile tools and techniques employed in genetic engineering and
- recombinant DNA technology.
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- biology.
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- Use, and interpret results of, the principal methods of statistical inference and design; helps to communicate the results of statistical analyses accurately and effectively; helps in usage of appropriate tools of statistical software.

Higher Education

- M.Sc. in Zoology
- M.Sc. in Genetics
- M.Sc. in Biochemistry
- M.Sc. in Forensic science
- M.Sc. in Applied Zoology
- M.Sc. in Molecular Biology

- M.Sc. in Biotechnology
- M.Sc. in Endocrinology
- M.Sc. in Immunology
- M.Sc. in Ecology
- M.Sc. in Wildlife science
- B.Ed.

Studying Zoology also provides opportunities to take Competitive exams like

- Indian administrative service (IAS)
- Karnataka administrative service (KAS)
- Indian Forest service (IFS) exams
- State Government Forest service exams
- SDA and FDA exams

Carrer Opportunities in Zoology

- Wildlife Rehabilitators
- Wildlife Educators
- Researchers
- National Parks/Wildlife Sanctuary Managers
- Animal Breeders Education

Job options

- Academic researcher
- Animal nutritionist
- Ecologist
- Environmental consultant
- Environmental education officer
- Higher education lecturer
- Marine scientist
- Nature conservation officer
- Science writer
- Zookeeper
- Zoologist

Jobs where the degree (Zoology) would be useful:

- Animal physiotherapist
- Environmental manager
- Field trials officer
- Marine biologist
- Research scientist (life sciences)
- Toxicologist
- Veterinary nurse
  Veterinary surgeon

DEPARTMENT OF MICROBIOLOGY

PROGRAM OUTCOMES

- Knowledge and understanding of concepts of microbiology and its application in pharma, food, agriculture, beverages, nutraceutical industries.
- Understand the distribution, morphology and physiology of microorganisms and demonstrate the skills in aseptic handling of microbes including isolation, identification and maintenance.
- Competent to apply the knowledge gained for conserving the environment and resolving the environmental related issues.
- Learning and practicing professional skills in handling microbes and contaminants in laboratories and production sectors.
- Exploring the microbial world and analyzing the specific benefits and challenges.
- Applying the knowledge acquired to undertake studies and identify specific remedial measures for the challenges in health, agriculture, and food sectors.
- Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.
- Understanding biochemical and physiological aspects of microbes and developing broader perspective to identify innovative solutions for present and future challenges posed by microbes.
- Understanding and application of microbial principles in forensic and working knowledge about clinical microbiology.
- Demonstrate the ability to identify ethical issues related to recombinant DNA technology, GMOs, intellectual property rights, biosafety and biohazards.
- Demonstrate the ability to identify key questions in microbiological research, optimize research methods, and analyze outcomes by adopting scientific methods, thereby improving the employability.
- Enhance and demonstrate analytical skills and apply basic computational and statistical techniques in the field of microbiology.

LEARNING OUTCOMES / COURSE OUTCOMES

- Thorough knowledge and understanding of concepts of microbiology.
- Learning and practicing professional skills in handling microbes.
- Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.
- Knowledge about microbes and their diversity.
- Study, characters, classification and economic importance of Pro-eukaryotic and Eukaryotic microbes.
- Knowledge about viruses and their diversity.
- Differentiating concepts of chemo heterotrophic metabolism and chemo lithotrophic metabolism.
- Describing the enzyme kinetics, enzyme activity and regulation.

- Differentiating concepts of aerobic and anaerobic respiration and how these are manifested in the form of different metabolic pathways in microorganisms

Many career opportunities exist in different sectors for microbiology students. Some of the sectors include:

- Food and Dairy Microbiology
- Agricultural Microbiology
- Biotechnology
- Genomics and Bioinformatics
- Pharmaceutical Technology
- Clinical and Medical Microbiology
- Industrial Microbiology
- Veterinary Microbiology
- Environmental Microbiology

There are numerous career opportunities for a microbiologist that depends on the level of education and skill one pursues. Some of these positions include Research Assistant, Research Scientist, Technician, Scientific writer, Quality Control/Assurance Officer, Technical writer, etc.

DEPARTMENT OF BIOTECHNOLOGY

PROGRAM OUTCOMES

- Understanding concepts of Biotechnology and demonstrate interdisciplinary skills acquired in cell biology, genetics, biochemistry, microbiology, and molecular biology.
- Demonstrating the Laboratory skills in cell biology, basic and applied microbiology with an emphasis on technological aspects.
- Competent to apply the knowledge and skills gained in the fields of Plant biotechnology, animal biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.
- Critically analyze the environmental issues and apply the biotechnology knowledge gained for conserving the environment and resolving the problems.
- Demonstrate comprehensive innovations and skills in the fields of biomolecules, cell and organelles, molecular biology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.
- Apply knowledge and skills of immunology, bioinformatics, computational modelling of proteins, drug design and simulations to test the models and aid in drug discovery.
- Critically analyze, interpret data, and apply tools of bioinformatics and multi omics in various sectors of biotechnology including health and Food.
- Demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of biotechnology.
- Learning and practicing professional skills in handling microbes, animals and plants and demonstrate the ability to identify ethical issues related to recombinant DNA technology, genetic engineering, animals handling, intellectual property rights, biosafety, and biohazards.

- Exploring the biotechnological practices and demonstrating innovative thinking in addressing the current day and future challenges with respect to food, health, and environment.
- Thorough knowledge and application of good laboratory and good manufacturing practices in biotech industries.
- Understanding and application of molecular biology techniques and principles in forensic and clinical biotechnology.
- Demonstrate entrepreneurship abilities, innovative thinking, planning, and setting up small-scale enterprises or CROs.

LEARNING OUTCOMES / COURSE OUTCOMES

- **At the end of the course the student should be able to:**
- Would be able to comprehend the structure of a cell with its organelles.
- Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations.
- Skill enhancement as per National Occupational Standards (NOS) of "Lab Technician/ Assistant" Qualification Pack issued by Life Sciences Sector Skill Development Council - LFS/Q0509, Level 3
- Knowledge about major activities of biotech industry, regulations, and compliance, environment, health, and safety (EHS), good laboratory practices (GLP), standard operating procedures (SOP) and GMP as per the industry standards.
- Demonstrate soft skills, such as decision making, planning, organizing, problem solving, analytical thinking, critical thinking, and documentation.
- Acquire knowledge about types of biomolecules, structure, and their functions.
- Will be able to demonstrate the skills to perform bioanalytical techniques.
- Apply comprehensive innovations and skills of biomolecules to biotechnology field.
- Study the advancements in molecular biology with latest trends.
- Will acquire the knowledge of structure, functional relationship of proteins and nucleic acids.
- Aware about the basic cellular processes such as transcription, translation, DNA replication and repair mechanisms.
- Explain the chemical makeup of life such as carbohydrates, proteins, nucleic acids and fats.
- Provide the classifications, structural & chemical properties, role &biological importance of Carbohydrates,
- Amino acids & Proteins, Lipds, Enzymes, Vitamins, Nucleic Acids and Harmones with suitable examples.
- Describe the biochemical pathways involved in metabolic processes involving above biomolecules.
- Describe the different types of Bioanalytical tools used in quantative and qualitative analysis of
- biomolecules such as electrophoresis, Spectroscopy & Radioisotope techniques.
- Practically test for the qualitative & quantitative measurements of biomolecules.

- Practically determine the enzyme activity of an enzyme such as amylase.
- Practically grasp the concepts and perform the process of reagent preparation.
- Separate biomolecules using Chromatography & Electrophoresis.
- Explain the principles and SOP's of basic instruments used in the biochemical analysis.
- Explain the history and important experiments in molecular biology involving DNA.
- Describe the concept of gene and the detailed mechanism of transcription, translation and regulation processes in
- prokaryotic & eukaryotic organisms.
- Explain the mechanism of processing of Pre-mRNA.
- Explain the post transcriptional Processing of rRNA & tRNA
- Describe the concept of Fidelity of translation and post translational modification.
- Explain the principal & steps involved in deciphering of genetic code, and its universality.
- Describe the process of Protein folding and targeting.
- Explain the process of Regulation of gene expression through transcriptional control in both eukaryotes and
- prokaryotes.
- Describe the translational control mechanism in regulation of gene expression.

Career opportunities in Biotechnology

- M.Sc. Biotechnology
- M.Sc. Toxicology
- M.Sc. Animal biotechnology
- M.Sc. Molecular medicines
- Masters in Public Health
- M.Sc. Bioinformatics
- M.Sc. Applied Biology
- M.Sc. Virology
- M.Sc. Bioinformatics
- M.Sc. Forensic Science
- M.Sc. Nanotechnology
- M.Sc. Pharmacology
- M.Sc. Industrial biotechnology
- Agri-biotechnology
- Forensic Science Technicians
- Environmental Biotechnologist
- Geneticist
- Molecular Biotechnologist
- Pharmaceutical Biotechnologist
- Bio-health
- Industrial biotechnology

Top 5 Career Oriented Certification Courses for Biotechnology students

- Crispr Basic Certification Course.
- Artificial intelligence in Biology Certification Course.

- Next-Gen Sequencing Certification Course.
- Clinical Data Management Certification Courses.
- Certification Course on Molecular Biology Techniques.

Research funds for Biotechnology

1. Biotechnology ignition grant scheme (BIG)
   - Foster generation of ideas with commercialization potential
   - Encourage researchers to take technology closer to market through a start up

2. Biotechnology Industry Research Assistance Council (BIRAC)

- Set up by Department of Biotechnology (DBT), Government of India
- Strengthen and empower the emerging Biotech enterprise
- Undertake strategic research and innovation

DEPARTMENT OF BIOCHEMISTRY

PROGRAM OUTCOMES

- To create interest in Biochemistry and appreciation for chemical basis of biological processes.
- To inculcate the spirit of inquiry and value of systematic study of a discipline.
- Provide a general understanding of the related disciplines with a holistic knowledge generation in biological sciences.
- To provide an in-depth understanding of chemical reaction mechanisms in biological processes.
- To provide a flavor of historical developments of enzymes and their applications in research, diagnostics and various industries.
- Gain proficiency in basic laboratory techniques and be able to apply the scientific method to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.
- Develop problem solving and analytical skills through case studies, research papers and hands-on-experience.
- To appreciate biochemical mechanistic basis of physiological processes, metabolism under normal and pathological conditions importance and levels of metabolic regulations.
- To apply and effectively communicate scientific reasoning and data analysis in both written and oral forms. They will be able to communicate effectively with well-designed posters and slides in talks aimed at scientific audiences as well as the general public.
- To bridge the knowledge and skill gap between academic out and industry requirements.
- To give students experience in conducting independent, hypothesis-driven, biological research, project planning and management.
- To provide skills to publish research findings, and awareness of IP rights, and scientific publication ethics and problems of plagiarism.
- To prepare competent human resource with better knowledge, hands-on experience and scientific attitude, at national and global levels for careers in research and development, academia and Pharma, biotech and agro, and food processing industries.

LEARNING OUTCOMES / COURSE OUTCOMES

- This will inculcate confidence and clarity of mind in students to understand the chemistry of biomolecules, and biological reactions.
- These topics will enable students to understand the fundamentals of chemical processes in biological systems.
- These topics will enable students to understand the fundamentals of organic chemistry pertinent to their importance in understanding biochemical reactions.
- Understand the concept of biological sample preparation.
- Appreciate chemistry and application of analytical instruments.
- Get acquainted with care and maintenance of equipment and chemicals.
- Understand clinically relevant biochemical analysis of all biochemical components i.e., proteins, electrolytes, hormones etc.,
- Have basic knowledge of clinical and forensic analytical methods and their principles.
- To create interest in Biochemistry and appreciation for chemical
- basis of biological processes.
- Be able to demonstrate accurate quantitative and qualitative analysis.
- Be able to Understand and effectively apply scientific ethics.
- Through this course the students are exposed to importance of biological macromolecules.
- They study the influence and role of structure in reactivity of biomolecules.
- At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions.

DEPARTMENT OF COMMERCE & BUSINESS ADMINISTRATION
PROGRAM OUTCOMES: B.COM.

- To develop the skills required for the application of accounting concepts and techniques learned in the classroom at the workplace.
- To provide competent and technical skills personnel to the industry in the area of Accounting, Finance, Taxation, Cost and Management Accounting.
- To enhance the employability skills of the commerce students.
- To enhance the capability of the students, improve their decision-making skills.
- To enhance the capability of the students to make decisions at personal and professional level.
- To encourage entrepreneurship among students pursuing education in the field of Commerce.
- To empower students for pursuing professional courses like Chartered Accountancy, Cost and Management Accountancy, Company Secretary, etc.,
- To ensure holistic development of Commerce students.
- To enable the students to understand the system of preparing financial statement of sole trading concern and to create an awareness in the students about Financial Reporting Standards.
- To enable the students to understand the various functions of management• various types of organizations and to create an awareness in the students about application of management principles in business organizations

- To enable students to understand the basic concepts and principles of Marketing
- To enable the students to understand the basics of accounting, need for accounting in business and the system of preparing financial statements - to create an awareness in the students about Financial Reporting Standards
- To enable the students to understand the basics of managing workforce at work place and know the process of selection, training and development.
- To enable the students to understand the maintaining of accounts for various types of business firms including non- profit organizations.
- To enable the students to understand the types of companies incorporated in India and the promoters involved in forming a company and Company administration till its Liquidation
- To enable students to acquire specialized knowledge of law and practice relating to banking
- To create awareness in student about the need for possessing financial literacy education.
- To enable students to understand how the retail business functions and highlight the scope of retail business in India and across the world.

LEARNING OUTCOMES / COURSE OUTCOMES: B.COM.

- The students will be able to prepare and analyze financial statements of sole trading concerns.
- The students will be able to understand and identify the different theories of organization, which are relevant in the present context.
- Compare and chose the different types of motivation factors and leadership styles.
- Students will be able to learn the application of Principles of marketing by business firms
- The students will be able to prepare subsidiary books and to prepare and analyze financial statements of sole trading concern.
- The students will be able to manage themselves at work place and know the nuances of managing human resources.
- The students will be able to prepare the final accounts of business firms and NPO and they will be able to account for loss of stock.
- Identify the stages of formation and documents involved in the formation of company.
- Role of Managerial Personnel and procedure of conducting company meetings.
- Students will understand the conceptual frame work of Banking, classification of Banking, banker and customer relationship and E-Banking services.
- The students will be able to understand the importance of financial literacy and prepare financial plans and budgets.
- The student will be able to describe the importance of insurance services as social security measures.
- Students will be able to acquire skills required for managing retail business and start their own retail business in the future.
- Familiarizes statistical data and descriptive statistics for business decisionmaking.
- Comprehend the measures of variation and measures of skewness.
- Demonstrate the use of probability and probability distributions in business.
- Validate the application of correlation and regression in business decisions.

- Show the use of index numbers in business.
- Know the procedure of redemption of preference shares.
- Comprehend the different methods of Mergers and Acquisition of Companies
- Understand the process of internal reconstruction.
- Prepare the liquidators final statement of accounts.
- Understand the recent developments in accounting and accounting standards
- To provide competent and technical skills personnel to the industry in the area of Marketing, Finance, Human Resource, Data Analytics, Retailing and Logistics and Supply Chain Management.
- To enhance the employability skills of the management students.
- To enhance the capability of the students, improve their decision-making skills.
- To encourage entrepreneurship among students pursuing education in the field of Business Administration.
- To empower students of pursuing professional courses like MBA, Chartered Accountancy, Company Secretary, etc.,
- To ensure holistic development of Business administration students.

DEPARTMENT OF COMMERCE & BUSINESS ADMINISTRATION

PROGRAM OUTCOMES: BBA

- To develop the skills required for the application of business concepts and techniques learned in the classroom at the workplace.
- To provide competent and technical skills personnel to the industry in the area of Marketing, Finance, Human Resource, Data Analytics, Retailing and Logistics and Supply Chain Management.
- To enhance the employability skills of the management students.
- To enhance the capability of the students, improve their decision-making skills.
- To encourage entrepreneurship among students pursuing education in the field of Business Administration.
- To empower students of pursuing professional courses like MBA, Chartered Accountancy, Company Secretary, etc.,
- To ensure holistic development of Business administration students.

LEARNING OUTCOMES / COURSE OUTCOMES: BBA

- The ability to understand concepts of business management, principles and function of management.
- The ability to explain the process of planning and decision making.
- The ability to create organization structures based on authority, task and responsibilities.
- The ability to explain the principles of direction, importance of communication, barrier of communication, motivation theories and leadership styles.
- The ability to understand the requirement of good control system and control techniques.
- Understand the framework of accounting as well accounting standards.
- The Ability to pass journal entries and prepare ledger accounts.

- The Ability to prepare subsidiaries books.
- The Ability to prepare trial balance and final accounts of proprietary concern.
- Construct final accounts through application of tally.
- Understand the concepts and functions of marketing.
- Analyze marketing environment impacting the business.
- Segment the market and understand the consumer behavior.
- Describe the 4 p's of marketing and also strategize marketing mix.
- Describe 7 p's of service marketing mix.
- An understanding of the nature, objectives and social responsibilities of business.
- An ability to describe the different forms of organizations.
- An understanding of the basic concepts of management.
- An understanding of functions of management.
- An understanding of different types of business combinations.
- An understanding of basic knowledge of office organization and management.
- Demonstrate skills in effective office organization.
- Ability to maintain office records.
- Ability to maintain digital record.
- Understanding of different types of organization structures and responsibilities as future office managers.
- The ability to prepare final accounts of partnership firms.
- The ability to understand the process of public issue of shares and accounting for the same.
- The ability to prepare final accounts of joint stock companies.
- The ability to prepare and evaluate vertical and horizontal analysis of financial statements.
- The ability to understand company's annual reports.
- Ability to describe the role and responsibility of Human resources management functions on business.
- Ability to describe HRP, Recruitment and Selection process.
- Ability to describe to induction, training, and compensation aspects.
- Ability to explain performance appraisal and its process.
- Ability to demonstrate Employee Engagement and Psychological Contract.
- An Understanding of components of business environment.
- Ability to analyze the environmental factors influencing business organization.
- Ability to demonstrate Competitive structure analysis for select industry.
- Ability to explain the impact of fiscal policy and monetary policy on business.
- Ability to analyze the impact of economic environmental factors on business.
- The Understanding of the basic concepts of business math's and apply them to create solve and interpret application problems in business.
- Ability to solve problems on various types of equation.
- Ability to solve problems on Matrices and execute the laws of indices, law of logarithm and evaluate them.
- Ability to apply the concept of simple interest and compound interest bills.
- discounted etc. and apply them in day-to-day life.
- Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

- Ability to examine the difference between People Management with Human resource Management.
- Ability to explain the need for and importance of People Management.
- Ability to explain role of manager in different stages of performance management process.
- Ability to list modern methods of performance and task assessment.
- Ability to analyses the factors influencing the work life balance of a working individual. An understanding of the types and forms of Retail business.
- Ability to examine Consumer Behavior in various environment.
- Ability to analyses various Retail operations and evaluate them.
- Ability to analyses various marketing mix elements in retail operations.
- An understanding of Information Technology in retail business.
- The ability to prepare material requisitions and management of store.
- The ability to compare and contrast labour cost techniques.
- Ability to differentiate kinds of overhead costing.
- Ability to reconcile the cost.
- To understand the requirements of statistical framework to construct and visualize the data.
- To determine the data adequacy for analysis.
- To Review the data by using various tools.
- To understand and analyze the impact of probability.
- To identify the goals of financial management.
- To apply the concepts of time value of money for financial decision making.
- To evaluate projects using capital budgeting techniques.
- To design optimum capital structure using EBIT and EPS analysis.
- To evaluate working capital effectiveness in an organization.
- Understand the elements of costing and preparation of cost sheet.
- Explain the application of management accounting and various tool used
- Make inter – firm and inter- period comparison of financial statements
- Analyse financial statements using various ratios for business decisions.
- Prepare fund flow and cash flow statements
- Prepare different types of budgets for the business.

DEPARTMENT OF CHEMISTRY
M.Sc. in CHEMISTRY

PROGRAM OUTCOMES FOR PG CHEMISTRY

Students who have completed the M.Sc. Chemistry curriculum will be able to:

- **PO1:** Demonstrate and extend fundamental understanding of chemistry's core concepts in a variety of areas.
- **PO2:** Inculcate the subject's significance as a forerunner of numerous technological advances since the dawn of humanity.
- **PO3:** Develop analytical reasoning skills and scientific approach, an open-minded and reasoned approach; critically analyze theories, facts, and interactions.
- **PO4:** Continue to gain applicable experience and skills for practical practices while demonstrating the highest ethical principles in the field.
- **PO5:** Develop scientific expertise in various areas of chemistry, such as organic, nanoscience, theoretical, physical, and others, by dissertation/project practice.

LEARNING OUTCOME/ COURSE OUTCOMES FOR PG CHEMISTRY

Course: Inorganic chemistry

- **CO1:** Students will able to understand the concept of structural arrangements of different ionic crystals, hybridizations of inorganic molecules and their molecular treatment
- **CO2:** Students will able to understand the theories of acids and bases and their applications in various fields.
- **CO3:** Students will able to understand the periodic properties, trends and separation of f-block elements, and their uses in medicinal field.
- **CO4:** Students will able to understand the concept, theories and various factors that effects the formation of coordination compounds.
- **CO5:** Based on the various theories of coordination compounds students are able to understand electronic transitions, terms and symbols, Orgal and Tanabe Sugano diagrams, charge transfer spectra and magnetic properties.
- **CO6:** Students will able to understand reactions, mechanisms, stereochemistry, photochemistry of coordination compounds.
- **CO7:** To learn the fundamentals, preparation, nature of bonding that exists in organometallic compounds.
- **CO8:** Students will gain the knowledge of catalytic activity and uses of organometallic compounds in various industrial large-scale synthesis of chemicals.
- **CO9:** To acquire the knowledge of structure and synthetic applications of metallic clusters, silicates and silicones.
- **CO10:** Able to understand the role various metal ions in biological systems and their interactions.
- **CO11:** To learn the concept of chemistry involved in oxygen transport, enzymes activity electrons transport in various biological systems.
- **CO12:** To understand the deficiency, causes and treatment caused due to variation in ions deficiency.

Course: Organic Chemistry

- **CO1:** Students understand the different types of representation of organic molecules, optical activity, selectivity and their conformational analysis.
- **CO2:** The basic concepts of organic reactions, aromatic systems and determination of reaction mechanism.
- CO3: To study the basic reactions, their diversifications and some named reactions.
- **CO4:** To learn the concept of oxidation and reductions by catalyst, various reagents, and named reactions.
- **CO5**: A study on reagents and reactions in multi-step organic synthesis.
- **CO6:** Study of molecular rearrangements and retro synthesis by disconnection approach.
- **CO7:** Students will able to understand photochemical reactions, their associated reactions and pericyclic reactions.
- CO8: To understand the concepts and reactions of organometallic compounds.
- **CO9:** To gain the knowledge of asymmetric synthesis, topo city, reactions involving asymmetric catalyst and reagents.
- **CO10:** To know the concept of occurrence, structure, reactivity and synthesis of some important heterocycles.
- **CO11:** Students will be able to understand the carbohydrate chemistry, their structural variations in nature and study of biological importance.
- **CO12:** Students will be able to understand the amino acids, proteins and nucleic acids chemistry, their structural variations in nature and study of biological importance.

Course: Physical chemistry

- **CO1:** Students will gain the knowledge of entropy, free energy, partial molar properties, fugacity, activity and thermodynamics of dilute solutions.
- **CO2:** Students will learn the concepts of kinetics of complex reactions, theories of reaction rates, potential energy surfaces, reactions in solutions and fast reactions.
- **CO3:** Students will be able to understand the concept of electrochemistry of solutions, energetic of cell reactions and irreversible process of electrodes.
- **CO4:** Gain the knowledge of Schrodinger wave equation, concept of operators, postulates of quantum mechanics, Eigen functions, Eigen values and applications of Schrodinger wave equation.
- **CO5:** Acquire the knowledge of thermodynamic probability, partition functions, different distribution laws and phase rule studies.
- **CO6:** Students will gain the knowledge of fundamentals of polymers, polymerization, determination of molecular weights, kinetics of polymerization, phase transitions in polymers, thermal characterization, polymers in solutions and colloids.
- **CO7:** Gain the knowledge of homogeneous catalysis, kinetics of enzymes, linera free energy relationship, and kinetic isotope effect.
- **CO8:** They will learn the concepts of electrochemical cells, batteries, electroplating, basis of electrochemical corrosion, thermodynamic aspects of corrosion and corrosion inhibition mechanism.
- **CO9:** Students will able to understand the concepts of crystals such as experimental methods to determine the crystal structures and imperfections in atomic packing and its physical properties.
- **CO10:** Students will gain the knowledge of laws of photochemistry, quantum yield and its determination, term symbols for atoms and its significance, and photochemical kinetics.
- **CO11:** They will learn the concepts of interaction of electromagnetic radiation with matter, chemical dosimetry, 14C dating, hazards in radiochemical work and radiation protection, and radiation detection and measurement.
- **CO12:** Students will gain the knowledge of radioactive decay, nuclear reactions, production of radioisotopes and labeled compounds by bombardment, radiochemical separation techniques, and nuclear power reactors.

Course: Analytical chemistry

- CO1: To learn Analytical chemistry, errors, calibration and measurement and figures of merit of analytical method.
- CO2: Learn the concepts of preparing samples for analysis, titrimetric analysis and acid-base titrations in aqueous media.
- CO3: Students will learn the precipitation, complexometric and redox titrations.
- CO4: To learn the concepts of group theory, points group and its application.
- CO5: Learn the concepts of microwave, vibration and Raman spectroscopy.
- CO6: Learn the concepts of UV- visible spectroscopy and its application.
- CO7: Learn the concepts of NMR Spectroscopy and 13C-NMR Spectroscopy and its application and multiple resonance spectroscopy.
- CO8: Students gain knowledge of electron spin resonance spectroscopy and NQR, Mossbauer and photoelectron spectroscopy.
- CO9: Students understand the concepts of IR and Mass spectroscopy and its applications.

- CO10: Students learn the concepts of atomic and molecular spectroscopy with instrumental method and also learn plasma emulsion, flame emulsion and X-Ray spectroscopy with instrumentation and application.
- CO11: Learn the concepts of Thermogravimetric analysis and differential thermal analysis, differential scanning calorimetry and microcalorimetry.
- CO12: Learn the concepts of kinetic methods of analysis; it includes order of reaction, rates of reaction. Learn brief outline of IR, NMR, and Mass spectroscopy as tools for kinetic study.

COURSE: CHEMISTRY PRACTICAL

ANALYTICAL CHEMISTRY PRACTICALS

- CO1: Develop firm foundations in the fundamental of analytical chemistry to build an interface of practical concepts with their industrial applications.
- CO2: Demonstrate various tools to analyze samples for quantitative and qualitative estimation and facilitate the learner to make solutions of various molar concentrations.
- CO3: Analysis of some pharmaceutical drugs.
- CO4: Determination of percentage purity of some compounds.

INORGANIC CHEMISTRY PRACTICALS

- CO1: Outline the proper procedures and regulations to safe use of chemicals for identification of quantitative estimation of inorganic compounds.
- CO2: Apply the fundamental principles of semi micro qualitative analysis of inorganic ion mixtures.
- CO3: Preparation of inorganic complexes.
- CO4: Volumetric analysis.

ORGANIC CHEMISTRY PRACTICALS

- CO1: Outline the proper procedures and regulations to synthetic organic purpose and safe use of chemicals.
- CO2: Identify the functional group and solve chemical problems to explore new areas of research.
- CO3: Preparation of organic compounds
- CO4: Quantitative organic analysis

PHYSICAL CHEMISTRY PRACTICALS

- CO1: Demonstrate skills in laboratory techniques and the use of the instrumentation for analysis.
- CO2: Demonstrate a comprehensive understanding of the fundamental principles and multidisciplinary concepts in the field of chemical kinetics.
- CO3: Analysis of binary mixtures
- CO4: Determination of molecular weight of polymers.

Higher Studies:

- Forensic Science courses
- Laboratory Technique courses
- Biochemistry courses
- Ph. D. in Chemistry

Jobs:

- Pharma Sales Executives
- Toxicologist
- Quality control manager
- Research Scientist
- Laboratory Assistant
- Chemist
- Clinical research associate

DEPARTMENT OF COMMERCE
PROGRAM OUTCOMES FOR M.COM.

- Helps to impart knowledge regarding strategic financial planning.
- Cultivating cognitive skills required in the job market.
- Enable them to gain expert knowledge in the cost and management accounting, corporate accounting and solve specific problems.
- Apply the knowledge of Business Analytics, Accounting for managers, Credit risk management etc.
- Cultivating aptitude for research.
- Applying theoretical and practical exposure gained during the course of study.

LEARNING OUTCOMES / COURSE OUTCOMES: M.COM.

- Enable the student to understand the concept of corporate governance.
- Help students to know about corporate ethics and cultural influences.
- Impart knowledge of corporate social responsibility and accountability.
- Give information about the corporate governance reforming committee reports in India.
- To understand the conceptual ideology of auditing and its practices.
- To know the importance of auditing with different accounting practices.
- To compare the national auditing practices with international auditing principles.
- To have a detailed knowledge on Auditing Standards and its uses.
- To evaluate impact of auditing on the Indian & global economy and its contribution for the economic development.
- Understand the comprehend the role of capital markets.
- Evaluate the various capital markets instruments like Stock, bonds, etc.
- The basics of new instruments like futures and options.

Higher Studies:

- MBA
- ACCA (Association of Chartered Certified Accounts)
- Chatted Account courses.
- Become a Certified Public Accountant.
- Chartered Financial Analyst courses

Jobs:

- Digital Marketing
- Investment Banker
- Tax consultant
- Stock broker