

Shri Shivaji Education Society, Amravati's



**Mahatma Fule Arts, Commerce and Sitaramji  
Chaudhari Science Mahavidyalaya, Warud**

**DIST. AMRAVATI (M.S.) 444 906 Ph.(Off.) : 07229-232 002**

**ESTD : 1960**

**NAAC Reaccredited with 'B' Grade with CGPA-2.24**

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Bhausaheb Deshmukh**  
M.A., D. Phil., LL.B., Bar-at-  
Law

***2.6.1. Teachers and students are aware of the stated  
Programme and course outcomes of the  
Programme offered by the institution.***

- ***Programme outcomes, Programme  
Specific outcomes and Course outcomes***

## **Program Outcomes and Course Outcomes**

### **Programme Outcomes: Bachelor of Science (B. Sc.)**

- Enrich knowledge of students in all basic sciences
- Ability to identify, formulate and develop solutions to computational challenges
- Develop Scientific temper and Scientific thinking
- Inculcate sense of scientific responsibilities and social & environment awareness
- Help student to build-up a progressive and successful career in academics and industry
- Sensitivity towards environmental concerns and contribute in the development of Nation.

### **Syllabus for B.Sc. Part-I**

#### **Subject: Compulsory English**

#### **General Course Outcome (COs) :**

1. To facilitate the learners in acquiring listening and speaking competence
2. To assist the learners in independent language comprehension and production
3. To make the students aware of the different communicative functions of English.
4. To impart skills and proficiency for being employed as teachers, state government employees, civil aviation, engineering and medico-related industry, defense, commerce and taxation sector.
5. To be able to speak, write, read and listen flawlessly in person and through the electronic mode in English.
6. To understand views of others, mediate contradictory views/ disagreements, reaching conclusion in groups / group discussions.
7. To understand and use basic skills of the English language for applying it in the job assigned / employment accepted / profession undertaken.

#### **Course Specific Outcome:**

After completion of this course successfully, students would be able to

1. Understand nature and nuances of English Language used in prose lessons, poetic passages.
2. Apply the knowledge of English to communicate with others on personal, social, literary and interdisciplinary topics.
3. Compare the structure of English language to use LSRW.

4. Formulate the sentences as per situational requirement.
5. Differentiate between acceptable and unacceptable sentences in English.
6. Create appropriate, grammatically correct and acceptable sentences in English.
7. Develop general language proficiency through listening, speaking, reading and writing

### **Course Learning Outcome:**

At the end of the Course, student would be able to:

1. Understand the paragraph, prose and poetry.
2. Apply the four skills of language in his daily inter-personal communications.
3. Formulate/ compose his own sentences and able to speak English Language.
4. Converse with other students in English.
5. Communicate their ideas and concepts properly in English.

### **B. Sc. I Semester I Compulsory English**

#### **Course Objective:**

- To train and prepare the students to seek and find employment in various field.
- To develop communicative competence in students
- To impart knowledge, ideas and concepts in the technicalities of proper pronunciation, structure, appropriate use and style of the English language as well as the application areas of English Communication.
- To expose the students to the employment opportunities, challenges and job roles.

#### **Course Outcomes:**

At the end of the Course, student would be able to:

CO1 Understand the paragraph, prose, poetry

CO2. Apply the four skills of language in his daily routine.

CO3. Formulate/ compose his own sentences and able to speak English Language.

CO4. Collaborate with others students in English.

CO5. Communicate properly their ideas and concepts in English.

## **B. Sc. I Semester II Compulsory English**

### **Course Objective:**

- To train and prepare the students to seek and find employment in various field.
- To develop communicative competence in students
- To impart knowledge, ideas and concepts in the technicalities of proper pronunciation, structure, appropriate use and style of the English language as well as the application areas of English Communication.
- To expose the students to the employment opportunities, challenges and job roles.

### **Course Outcomes:**

At the end of the Course, student would be able to:

CO1 Understand the paragraph, prose, poetry

CO2. Apply the four skills of language in his daily routine.

CO3. Formulate/ compose his own sentences and able to speak English Language.

CO4. Collaborate with others students in English.

CO5. Communicate properly their ideas and concepts in English.

### **Name of the Programme: B.Sc. Part-I, Semester – I&II**

### **Name of Course – Marathi Compulsory**

### **Course Outcome**

Apart from understanding the language, the high level of human values in the society should be inculcated in the students, national integration, social commitment, humanity, patriotism, patriotism, scientific approach, environment protection conservation, compassion etc. Sant Gadge Baba Amravati University has very thoughtfully adopted the policy of determining this course in the context of the new educational policy in accordance with the goal policies set by the Human Resource Commission of the Government.

### **Course Specific Outcome**

Marathi language is not only a subject of learning and teaching but also an effective medium of self-expression. It is also a culture that creates such a person. It should be multi-faceted, along with this, the direction of the comprehensive study of the language should be indicated to the students, and the various literary types and trends in literature should be identified.

### **Name of the Programme: B. Sc. Mathematics**

### **Programme Outcomes & Programme Specific Outcomes**

**POs :**

At the end of the programme, graduates would be able to

1. Enhance the knowledge of student in all basic sciences.
2. Identify, formulate and develop solutions to computational challenges.
3. Develop scientific temper and think in a critical manner.
4. Build up progressive and successful career in academics, industry and society.
5. Develop student's abilities and aptitudes to apply the mathematical ideas.

**PSOs:**

Upon completion of the programme successfully, students would be able to

1. Understand major concepts in all disciplines of Mathematics
2. Formulate and develop Mathematical arguments in a logical manner
3. Gain good knowledge and understanding in advanced Mathematics
4. Create an awareness of the impact of Mathematics on the environment, society and development outside the scientific community.
5. Create sensitivity towards environmental concerns and contribute in the development of nation.

**B. Sc. I Semester-I Mathematics Paper-I  
Course Outcomes OF Algebra and Trigonometry**

Students will able to

1. Find inverse and normal form of matrices.
2. Evaluate the characteristic equation, eigen value and corresponding eigen vector of a given matrix
3. Evaluate relation between the roots and coefficients of equations.
4. To study application of De Moivre's theorem.
5. Compute summation of trigonometric series.

**B. Sc. I Semester-I Mathematics Paper-II  
Course Outcomes of Differential and Integral Calculus**

Students will able to

1. Define limit and study the basic properties.
2. Classify continuity and discontinuity of the functions.

3. Solve the differentiability and L'Hospital rule with their applications.
4. Describe the geometrical applications of mean value theorems.
5. Evaluate the reduction formulae for integration.

### **B. Sc. I Semester-II Mathematics Paper-III**

#### **Course Outcomes of Differential Equations: Ordinary and Partial**

Students will be able to

- Solve first order differential equations using different techniques..
- Solve higher order differential equations and orthogonal trajectories.
- Calculate complementary function and particular integral of the second order differential Equation.
- Describe the different methods to solve second order differential equations.
- Illustrate applications of differential equations.

### **B. Sc. I Semester-II Mathematics Paper-IV**

#### **Course Outcomes of Scalar and vector Analysis and Geometry**

Students will be able to

- Interpret the vectors, their products, differentiation and integration.
- Determine curvature and torsion .
- Apply the concepts of divergence, curls which are useful in physics.
- Describe the different forms of sphere and properties.
- Discuss the equations of cone and cylinder.

### **B. Sc. I Semester-II Mathematics**

#### **Course Outcomes of Mathematics Numerical Ability-I**

**COs:** After completing this course, students would be able to

1. Restate the ideas and concept of HCF & LCM of number and also find square root & cube roots.
2. Illustrate the problem on numbers, ages, percentage, and profit and loss.
3. Analyze ratio and proportion, time, work and distance.
4. Outline the problems on train, simple interest, compound interest, area measurement.
5. Create the Bar graphs, Pie charts and Line graphs.

### **B. Sc. II Semester-III Mathematics Paper-V**

#### **Course Outcomes of Advanced Calculus**

Students will be able to

- Have knowledge and proofs of theorems on limits of sequences, bounded and monotonic sequences, Cauchy's convergence criterion.
- Series of non negative terms, convergence of geometric series and Comparison tests, Use of Cauchy's integral test, Ratio test, Root test.
- Understand the concept of absolute Convergent, conditional convergent, Leibnitz rule, Abel's test, Dirichlet's test.
- Understand the limit and continuity of functions of two variables, Algebra of limits and continuity, Taylor's theorem for function of two variables.
- Define and find the maxima and minima of functions of two variables
- Apply the Lagrange's multipliers method to find the maxima and minima of the functions of two variables.
- Evaluate the Jacobian of the function of two variables.
- Define and evaluate the double integrals.
- Change the order of integration in double integrals
- Define and evaluate the triple integrals.
- Prove and apply the Guass and Stoke's theorem.

**B. Sc. II Semester-III Mathematics Paper-VI**  
**Course Outcomes of Elementary Number Theory**

Students will able to

- Understand the concept and definition of the divisibility and their properties and results.
- Prove division algorithm and its application in finding the results on greatest common divisor; find the gcd and lcm of two or more integers.
- Understand the knowledge of Euclidean algorithm and its applications
- Define and find Prime numbers,
- Prove and apply the fundamental theorem of arithmetic or Unique factorization theorem, Find Fermat numbers, Understand the concept of linear Diophantine equations
- Define the Congruence and its properties. Have the knowledge of special divisibility test, linear congruences,
- Understand the proof and application of Chinese remainder theorem.
- Define and understand the concept of Arithmetic functions,
- Understand the proof of the apply Euler's theorem,
- Define and find the  $\tau$  and  $\sigma$  functions, Mobius  $\mu$  function.
- Define and find the Primitive roots, primitive roots for prime, polynomial congruences, the congruence  $x^2 \equiv a \pmod{p}$ , general quadratic congruence, quadratic residues.

**B. Sc. II Semester-IV Mathematics Paper-VII**

### **Course Outcomes of Modern Algebra: groups and rings**

Students will be able to

- Define and verify a group with examples, properties of a group, subgroups, cyclic groups, order of a generator of a cyclic group, permutation groups even and odd permutations.
- Define and find Cosets and normal subgroups: Cosets, Lagrange's theorem, normal subgroups, different characterizations of normal subgroups, algebra of normal subgroups, quotient group.
- Define and verify Homomorphism, homomorphic image, kernel of homomorphism, isomorphism of a group, and Fundamental theorem on homomorphism of a group, natural homomorphism, second isomorphism theorem, and third isomorphism theorem.
- Define and verify left ideal, right ideal, examples, algebra of ideals, prime ideal, maximal ideal, principal ideal, quotient ring, ring homomorphism.

### **B. Sc. II Semester-IV Mathematics Paper-VIII**

#### **Course Outcomes of Classical Mechanics**

Students will be able to

- Understand the concept of Constraints, generalized coordinates,
- State and prove D'Alembert's principle and be able to derive Lagrange's equations of motion from it.
- To construct the Lagrangian find the Lagrange's equations of motion.
- Understand the concept of central force field, types of central force. Equivalent one body problem, Define Areal velocity, obtain the equations of central orbit.
- State and prove the Virial theorem and the Kepler's laws of motion.
- Define a functional, extremals, Euler's differential equation, Brachistochrone problem, invariance of Euler's equation, study and be able to apply Euler-Poisson equations for a functional dependent on higher derivatives and obtain Euler-Ostrogradsky equations.
- Understand Hamilton's principle, Lagrange's equations for non-holonomic system, Routh's procedure, least action principle.
- Find the generalized co-ordinates of a rigid body, Eulerian angles, Euler's theorem and understand finite rotations, infinitesimal rotations.

### **B. Sc. III Semester-V Mathematics Paper-IX**

#### **Course Outcomes of Mathematical Analysis**

Students will be able to

- Define Riemann Integral, Integrability of continuous and monotonic functions,
- Understand the proof fundamental theorem of integral calculus, mean value theorem of integral calculus.
- Understand Improper integrals and their convergence, comparison and limit tests.



- Define and Beta and gamma and its applications.
- Have a knowledge of Continuity and differentiability of complex function, analytic function, Cauchy-Riemann equations and their application in analytic functions, harmonic and conjugate functions.
- Find the analytic functions by Milne-Thomson method.
- Have a knowledge of Elementary function, mapping by elementary function, Mobius transformation, fixed point, cross ratio and its application to find the bilinear transformation, inverse and critical points, conformal mapping.
- Have a knowledge about Metric spaces, Definition and examples of metric spaces, neighbourhood, limit point, interior point, open and closed sets, Cauchy sequences, completeness.

### **B. Sc. III Semester-V Mathematics Paper-X**

#### **Course Outcomes of Mathematical Methods**

Students will able to

- Define and solve Legendre's equation, Legendre's polynomials, generating function of  $P_n(x)$ , recurrence formulae for  $P_n(x)$ , orthogonality of Legendre's polynomial, Rodrigue's formula.
- Define and evaluate Bessel's equation, solution of Bessel's equation, generating function for  $J_n(x)$ ,
- Understand Recurrence formulae for  $J_n(x)$ . Strun-Liouville boundary value problem.
- Understand and apply the fundamental concept of Fourier series,
- Find the Fourier series for odd and even functions, half-range Fourier sine series and half-range Fourier cosine series.
- Learns the method and properties of Laplace transform of some elementary functions, existence of Laplace transform
- Understand Laplace transform of derivatives and integrals, multiplications of  $t^n$  and division by  $t$ , inverse Laplace transform,
- Understand the convolution property, application of Laplace transform in solving ordinary and partial differential equations.
- Understand and apply the fundamental concept of Fourier Transform: Finite Fourier sine transform, inverse finite Fourier sine transform and cosine transform, Infinite Fourier transform, infinite Fourier sine transform and cosine transform, properties of Fourier transform, application to pde.

### **B. Sc. III Semester-VI Mathematics Paper-XI**

#### **Course Outcomes of Linear Algebra**

Students will able to

- Understand the Definition and example of vector spaces, subspaces, sum and direct sum of subspaces, linear span, linear dependence, independence and their

basic properties, basis , finite dimensional vector spaces ,existence theorem for bases, invariance of the number of elements of a basis set, dimension

- Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations using rank – nullity theorem, inverse transformations to solve the problems of matrix transformations, change of basis.
- Define the Dual space, bidual space.
- State and prove the theorems on natural isomorphism, Define the adjoint of a linear transformation,
- Understand Eigen values and eigenvectors of a linear transformation and solve examples on it.
- Use the concept of inner product spaces to find norm of vectors, distance between vectors, check the orthogonality of vectors, to find the orthogonal and orthonormal basis.
- State and prove Cauchy-Schwarz inequality, orthogonal vectors, orthogonal complements, orthonormal sets and bases, Bessel's inequality for finite dimensional spaces, Gram Schmidt orthogonalisation process.
- Understand the concept of Modules, submodules, quotient modules, homomorphism and isomorphism theorems.

### **B. Sc. III Semester-V Mathematics Paper-XII**

#### **Course Outcomes of Linear Algebra**

Students will able to

- Have a knowledge of Newtonian Mechanics and understand Inertial frames, speed of light and Galilean relativity, relative character of space and time, postulates of special theory of relativity, Lorentz transformation and its geometrical interpretation, group properties of transformation.
- Understand the concept of Composition of parallel velocities, length contraction, time dilation, transformation equation for components of velocities and acceleration of a particle, Lorentz contraction factor. The thermodynamics of moving systems: The two laws of thermodynamics for a moving system, the Lorentz transformation for thermodynamics quantities a) volume and pressure b) energy c) work d) heat e) entropy f) temperature.
- Have a knowledge of Four dimensional Minkowskian space-time of relativity , time like and space like intervals , proper time , world line, four vectors and tensors in Minkowskian space-time ,past, present and future null cone .
- Understand the concept of basic tensors, covariant, contravariant, mixed , operations on tensors, outer product, inner product, quotient law.
- Understand the concept of Relativistic Mechanics. Variation of mass with velocity, equivalence of mass and energy, transformation equation for mass,

momentum and energy, relativistic force and transformation equations for its components, relativistic Lagrangian and Hamiltonian, the energy momentum tensor.

**Faculty: Science and Technology**

**Programme: M.Sc. Mathematics**

**POs**

At the end of the programme, students would be able to

- Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions.
- Innovate, invent and solve complex mathematical problems using critical understanding, analysis and synthesis.
- Adjust themselves completely to the demands of the growing field of Mathematics by lifelong learning.
- Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations
- Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

**PSOs**

Upon completion of the programme successfully, students would be able to

- Develop problem-solving skills and apply them independently to problems in pure and applied mathematics.
- Understand advanced mathematical knowledge and skills that prepare them to pursue further studies and research.
- Understand advanced and pure mathematical concepts and research.
- Create knowledge, capability in formulating and analyzing mathematical models of real life applications.
- Analyze the latest advances in applied mathematics such as numerical computations and mathematical modeling in physical sciences.

**Programme : M.Sc.-I ( Mathematics) Semester- I**  
**Course Outcomes of Mathematics Real Analysis**

**COs:**

On successful completion of this course, students would be able to

- restate the ideas and concept of Riemann – Stieltjes integral with some of its properties and apply the Fundamental theorem of integration.
- apply the Weierstrass M-test, Abel's and Dirichlet's tests for uniform convergence of sequences.
- differentiate between uniqueness theorem for power series, Abel's limit theorem and Tauber's first theorem.
- recognize the functions of several variables, linear transformation, partial and higher order derivatives in an open subset of  $\mathbb{R}$ .
- demonstrate the inverse function theorem, implicit function theorem and solve problems on maxima and minima of a function.

**Programme : M.Sc.-I ( Mathematics) Semester- I**  
**Course Outcomes of Mathematics Advanced Abstract Algebra**

COs:

On successful completion of this course, students would be able to

- recall the concepts of coset and normal subgroup and to prove elementary propositions involving these concepts.
- recognize different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.
- demonstrate the homomorphism, Sum and direct sum of ideals, maximal and prime ideals, nilpotent and nil ideals.
- translate the transition of important concepts of homomorphisms and isomorphisms from discrete Mathematics to advanced abstract Mathematics.
- interpret the Definition and examples of modules and Sub modules ,quotient modules, completely reducible modules and free modules.

**Programme : M.Sc.-I ( Mathematics) Semester- I**  
**Course Outcomes of Mathematics Complex Analysis**

COs:

On successful completion of this course, students would be able to

- identify Cauchy integral formula apply to find the value of function at inside point of the region.
- express the function in series of positive and negative power of variable in a given region.
- record the concept of singularities to find integral of complex valued function on some simple

connected region and multi connected region.

- apply the residue theorem to compute several kinds of real integrals.
- recognize about everywhere differentiable function and they will learn how it helps them to decide analyticity of function.

### **Programme : M.Sc.-I ( Mathematics) Semester- I Course Outcomes of Mathematics Topology –I**

#### **COs**

On successful completion of this course, students would be able to

- identify the cardinal and ordinal numbers and their role in building up the topology.
- demonstrate the concepts such as topological spaces ,open and closed sets, interior, closure and boundary.
- categories some important concepts like continuity, compactness, connectedness, projection mapping etc and prove related theorems.
- relates the basic concepts of countability axiom, separation axioms and convergence in topological spaces.
- distinguish between the regular, normal and completely regular spaces.

### **Programme : M.Sc.-I ( Mathematics) Semester- I Course Outcomes of Mathematics Advanced Discrete Mathematics-I**

#### **COs**

On successful completion of this course, students would be able to

- design the graphs, paths, circuits, cycles and subgraphs.
- determine Circuit, Fundamental Circuit, cut sets, fundamental cut sets of the graph.
- illustrate chromatic number
- describe introductory computability theory its techniques.
- apply graph theory to grammars and languages .

### **Programme : M.Sc.-I ( Mathematics) Semester- I Course Outcomes of Mathematics Differential Geometry (Optional)**

## COs

On successful completion of this course, students would be able to

- discuss the local intrinsic properties of a surface, curves on a surface, surfaces of revolution.
- Design arguments in the geometric description of family of curves and surfaces in order to establish basic properties of geodesics.
- apply Geodesics theorem and restate the Gaussian Curvature, Surface of constant curvature, conformal and Geodesic mappings.
- recognize the tensor calculus, tensor product of vector spaces, transformation formulae, contraction special tensors, and inner product.
- apply covariant differentiation, of tensors and use absolute derivation of tensorial forms and tensor connexion.

### **Programme : M.Sc.-I ( Mathematics) Semester- I Course Outcomes of Mathematics AEC on Real Analysis 02**

#### COs:

On successful completion of this course, students would be able to

- Create the interest to solving the problems and grasp new techniques.
- Analyze various concepts of Sequence and Series.

### **Programme : M.Sc.-I (Mathematics) Semester- II Course Outcomes of Mathematics Measure And Integration Theory**

#### COs:

On successful completion of this course, students would be able to

- analysis Lebesgue outer measure, regularity and Lebesgue measurability
- explain integration and non-negative function, the general integral, Riemann and Lebesgue integrals
- demonstrate the concepts of four derivatives, differentiation and integration
- discuss the measure and outer measure
- express completion of measure, measure spaces, Holder and Minkowski inequality

### **Programme : M.Sc.-I (Mathematics) Semester- II Course Outcomes of Mathematics Advanced Linear Algebra and Field Theory**

**COs:**

On successful completion of this course, students would be able to

- recall the concepts of eigen values , eigen vectors and polynomials.
- explain quadratic form, linear transformation, canonical and normal form.
- describe the concepts of algebraic extension of fields.
- discuss normal and separable extension of Group.
- understand the concepts of Galois theory and its application.

**Programme : M.Sc.-I (Mathematics) Semester- II  
Course Outcomes of Mathematics Integral Equations****COs:**

On successful completion of this course, students would be able to

- understand the type of integral equations.
- categorize Volterra integral equations of first and second kinds.
- determine the solution of Fredholm integral equations of the second kinds.
- define the concepts of iterated kernels and reciprocals kernels.
- explain solution of Volterra integral equations of second kinds

**Programme : M.Sc.-I (Mathematics) Semester- II  
Course Outcomes of Mathematics Topology****COs:**

On successful completion of this course, students would be able to

- categorize some important concepts of metric spaces.
- restate the ideas and concepts of complete metric spaces.
- interpret the definition and examples of product spaces.
- express the function and quotient spaces.
- discuss the metrization and para compactness.

**Programme : M.Sc.-I (Mathematics) Semester- II  
Course Outcomes of Mathematics Advanced Discrete Mathematics-II (Optional)****COs:**

On successful completion of this course, students would be able to

- develop the logical tools among the students.
- interpret the concepts of Semi-groups and Monoids.
- categorize the concepts of Lattice and sub lattice.
- apply the Boolean algebra to switching circuits.

**Programme : M.Sc.-I (Mathematics) Semester- II**  
**Course Outcomes of Mathematics Riemannian Geometry (Optional)**

**COs:**

On successful completion of this course, students would be able to

- discuss the properties of Christoffel symbols, divergence, gradient and Laplacian.
- demonstrate the concepts of parallel vector field.
- interpret the concepts of curvature tensor.
- categorize some concepts like Ricci tensor, curvature invariant and Einstein tensor.
- summarize the concepts of Riemannian curvature, space of constant curvature, intrinsic symmetric and killing vectors.

**Programme : M.Sc.-I (Mathematics) Semester- II**  
**Course Outcomes of Mathematics AEC on Advanced Linear Algebra and Field Theory 02**

**COs:**

On successful completion of this course, students would be able to

- understand the concepts of Advanced Linear Algebra
- develop the mental ability to solve the problems.

**Name of the Programme: B.Sc. PHYSICS**

**Programme outcomes & programme specific outcomes**

**POs:**

At the time of graduation, Students will be able to

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.



PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

### **PSOs:**

Upon completion of the Programme successfully, students would be able to

1. acquire a comprehensive knowledge and sound understanding of fundamentals of Physics
2. develop laboratory skills, enabling them to take measurement in a physics laboratory and analyze the measurements to draw valid conclusions.
3. be prepared to acquire a range of general skills, to solve problems, to evaluate information, to use computers productively, to communicate with society effectively and learn independently.
4. Develop good oral and written scientific communication skill.

### **Course Outcomes of Physics**

#### **B. Sc. part-I Semester I**

#### **Course Outcomes of Mechanics, Properties of matters, Oscillations & Relativity**

Students will be able to

- Discuss the basic concepts of rotational dynamics.
- Examine the phenomenon of simple harmonic motion and distinction between undamped, damped and forced oscillations and the concept of resonance.
- Explain the superposition of simple harmonic motion and acquire the knowledge of Ultrasonic waves, their production, detection and applications in different fields.
- Determine the constants of elasticity and relate it with appropriate things
- Interpret the postulates of special theory of relativity.
- Know the concept of Global positioning system (GPS)

- Apply the principles of measurement and error analysis.
- Develop the skills to handle various instruments with precision.

### **Course Outcomes of Physics**

#### **B. Sc. part-I Semester I**

#### **Course Outcomes of (Laboratory/Practical/practicum/hands on/Activity)**

##### **Cos**

On successful completion of this practical course, the students would be able to

1. List out, identify and handle various equipment likes different types of pendulum.
2. Learn the procedures of operation of various oscillating objects.
3. Acquire skills in observing and measuring different types of errors.
4. Perform procedures and techniques related to experiments based on mechanics.
5. Conduct an experiments collaboratively and ethically.

#### **B. Sc. part-I Semester II**

#### **Course Outcomes of Electrostatics, Magnetostatics, Ultrasonic Waves and Acoustics, Network Theorems**

##### **COs**

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

7. Discuss the concept of scalars & vectors and their properties.
8. Develop an understanding of Gauss law and its applications to obtain electric field in different cases.
9. Formulate the relationship between electric displacement vector, electric polarization and dielectric constant.
10. Distinguish between the magnetic effect of electric current, electromagnetic induction and the related laws in appropriate circumstances.
11. Simplify electrical circuits by applying various network theorems.
3. Make use of Multi meter for the measurement of electrical parameters and get the knowledge of electronic components and their applications.
4. Estimate the power consumption of domestic appliances and carry out energy audit.

#### **B. Sc. part-I Semester II**

#### **Course Outcomes of (Laboratory/Practical/practicum/hands on/Activity)**

##### **COs**

On successful completion of this practical course, the students would be able to

- 6. Simplify various electrical circuits by using network theorems.
- 7. Learn the procedures of operation of electrical components like capacitor, resistor and inductor.
- 8. Acquire skills in measuring dielectric constants of different materials.
- 9. Perform procedures and techniques related to experiments based on electrical and electronic circuits.
- 10. Conduct an experiments collaboratively and ethically.

### **Course Outcomes B.Sc. Physics**

#### **B. Sc. II Semester-III**

Students will able to

- Have a knowledge about the Scalar & Vector fields, Gradient, Divergence & Curl
- Study Ampere's law. Understanding the concepts through experiments in laboratory.
- Know the Faraday's law, understanding Maxwell's equation
- Study Poynting theorem
- Know the semiconductors, understand Hall effect and study of different types of diodes.
- Have knowledge about the BJT, types& applications of FET.
- Study IC,OP-AMP.
- Know the special theory of relativity, length contraction, Time dilation, Einstein's mass-energy relation.
- Develop numerical solving technique in students
- Know the structure of earth, Atmosphere, earthquakes.
- Understanding above concepts through experiments in laboratory.
- Develop numerical solving technique in students.

### **Course Outcomes B.Sc. Physics**

#### **B. Sc. II Semester-IV**

Students will able to

- Know the lens system, understand interference in thin films.
- Study Newton's ring.
- Know the types of diffraction.
- CO-2: To understand, diffraction through plane transmission grating.
- Study zone plates.
- Know the Polarization, Brewster's law.
- Study Nicol's prism.
- Understanding the mechanism of Laser, types & applications of laser, concept of holography.
- Have knowledge about the mechanism of Optical fiber.

- Understand types & applications of optical fiber, study optical communication system
- Understanding the types of renewable energy sources, concept of solar energy, study photovoltaic cell.
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students

### **Course Outcomes B.Sc. Physics**

#### **B. Sc. III Semester-V**

Students will able to

- Have a knowledge about the black body radiation.
- Study of Plank's radiation law & photoelectric effect.
- Study Compton effect & Heisenberg's uncertainty principle.
- Know the Schrodinger's wave equation.
- Understanding mathematical operator's.
- Study motion of particle in rectangular box.
- Know the different atomic models.
- Understand quantum numbers.
- Study Raman effect.
- Have the knowledge about the theory of nucleus.
- Understand alpha & beta decay.
- Study Nuclear reaction & reactor.
- Know the h-parameters.
- Understand concept of amplifier, study Noise & distortion in amplifier.
- Know the concept of feedback, electronic oscillators, study of multivibrators.
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students

### **Course Outcomes B.Sc. Physics**

#### **B. Sc. III Semester-VI**

Students will able to

- Have the knowledge about the phase space, unit cell, micro & macro states, Boltzmann's entropy relation
- Study Maxwell-Boltzmann statistics & its applications.
- Know the concept of boson & fermions.
- Understand Bose-Einstein statistics & its applications.
- Study Fermi-Dirac statistics & its applications.
- Know the crystalline & amorphous solids.
- Understand different crystal structures & X-ray diffraction, crystal defects.
- Know the concept of drift motion.

- understand Fermi energy.
- Study band structure in solids.
- Have knowledge about the concept of magnetism.
- Understand types of magnetic materials.
- Study Hysteresis.
- Know the concept of superconductors.
- Understand types of superconductors & BCS theory.
- Study Basic concepts of nanotechnology.
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students.

**Faculty: Science and Technology**  
**Programme: M. Sc Physics**

**POs:**

On completion of program, students would be able to

1. Gain advanced knowledge, general competence, and analytical skills that are required in industry, consulting, education, and research.
2. Instill an inquisitive mindset in the students so that they are capable of independent and critical thinking.
3. Get trained in such a way that they can objectively carry out investigations, scientific and/or otherwise, without being biased or without having any preconceived notions.
4. Apply the knowledge and skill in the design and development of Electronics circuits to fulfil the needs of Electronic Industry.
5. Become professionally trained in the area of electronics, optical communication, nonlinear circuits, materials characterization and lasers.
6. Develop research problems related to Physics and Materials characterization and applications.
7. Get nurtured as good researchers in the field of technology too.
8. Demonstrate highest standards of Actuarial ethical conduct and Professional Actuarial behavior, critical, interpersonal and communication skills as well as a commitment to life-long learning.

**PSOs:**

Upon completion of the programme successfully, students would be able to

1. Understand the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, statistical mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
2. Learn how to perform experiments in basic as well as advanced areas of Physics such as Nanomaterial, Condensed Matter Physics, Electronics and Photonics.
3. Develop Analytical and integrative problem-solving methodologies through research-based learning.
4. Pursue research careers, careers in academics, in industries in physical science and in allied fields.

### **Programme M.Sc. Physics Semester I & II**

#### **Course Outcomes of Mathematical Physics**

Upon completion of the course successfully, students would be able to

- Explain vector spaces and transformations, the algebra of matrix, partitioning of matrices; solve the eigen value problem.
- Define and analyze limits and continuity for complex functions as well as consequences of continuity; apply the concept and consequences of analyticity and the Cauchy-Riemann equations; analyze sequences and series of analytic functions and types of convergence.
- Obtain the general solution of a homogeneous linear constant-coefficient second-order differential equation; classify and explain the functions of different types of differential equations; explain the properties of Legendre Polynomial which may be solved by application of special functions.
- Recall the power series method in solving differential equations, and know how to check the correctness of the result; solve differential equations like Legendre, Bessel and Hermite that are common in physical sciences.
- Solve transfer functions in Instrumentation using Laplace transforms and apply Fourier transforms in various physical problems.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes of Classical Mechanics**

Upon completion of the course successfully, students would be able to

- Explain the basics of Newtonian mechanics and its limitations; state the conservation laws and theorems.
- Describe the motion of a mechanical system using Lagrange and Hamilton's formalism.
- Explain the motion of particle in central force field.
- Describe the stability of circular orbits, its classification and differential equation, derive Kepler's laws.
- explain the classical background of quantum mechanics and get comfortable with Poisson brackets and Hamilton -Jacobi equation; develop the understanding of canonical transformation and small oscillations

## **Programme M.Sc. Physics Semester I&II**

### **Course Outcomes of Quantum Mechanics-I**

Upon completion of the course successfully, students would be able to

- be familiar with the main aspects of the historical development of quantum mechanics and be able to discuss and interpret experiments that reveal the wave properties of matter, as well as how this inspired replacing classical mechanics with a wave equation;
- gain the knowledge about quantum mechanical axioms and the matrix representation of quantum mechanics;
- solve the Schrödinger equation on their own for simple systems in one to three dimensions, both analytically and by using robust numerical methods; use these solutions to calculate their time evolution, associated probabilities, expectation values, and uncertainties, as well as give concise physical interpretations and reasoning underlying the mathematical results;
- grasp the concepts of angular momentum and spin, as well as the rules for quantization and their additions;
- Distinguish between Schrodinger, Heisenberg and Interaction representations; use commutation relations to explain the outcome of measurements and apply Variation method to obtain the ground state energy of various systems and WKB method for one dimensional problems.

## **Programme M.Sc. Physics Semester I&II**

### **Course Outcomes of Computational Methods and Programming**

Upon completion of the course successfully, students would be able to

- Iteratively find the roots of smoothly varying functions with nonzero derivatives; carry out matrix operations, including inverses and determinants.
- Solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; determine eigenvalues and eigenvectors; use numerical methods for interpolation, finding roots of equations and curve fitting.
- Use numerical differentiation and integration for problems in physics; numerically, solve ordinary differential equations with boundary value problems.
- Independently program computers using high level programming language (C-programming).
- Formulate and computationally solve the selected problems in physics using C-programming.

## **Programme M.Sc. Physics Semester I&II**

### **Course Outcomes of 1PHY5- Computer Lab**

Upon completion of the course successfully, students would be able to

- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Write programs that perform operations using derived data types.
- Solve an algebraic or transcendental equation using an appropriate numerical method.

- Develop and execute of C-language based programs.
- Formulate codes to solve theoretical problems in physics using various computational tools

**Programme M.Sc. Physics Semester I&II**  
**Course Outcomes of 1PHY6- General Lab**

Upon completion of the course successfully, students would be able to

- Organize and assemble
- Experiments on Mechanics
- Experiments on Optics
- Experiments on Modern Physics
- Perform data acquisition using assembled experiment.
- Engage in experimental troubleshooting with teaching assistants.
- Identify sources of error and fluctuations in the collected data.
- Construct graph on graph paper and also using computer based the collected data.
- Analyze the collected data.
- Distinguish between theoretical predictions and experimental measurements.
- Verify the fundamental laws and universal constants in Mechanics, Optics and Modern Physics.

**Programme M.Sc. Physics Semester I&II**  
**Course Outcomes of 2PHY1 Electrodynamics-I**

Upon completion of the course successfully, students would be able to

- Solve electrostatic potential; Poisson and Laplace equations; Electrostatic energy density; electric energy of a charge distribution.
- Solve boundary value problems with the help of Poisson and Laplace equations; Green's function.
- Apply Biot-Savart Law and Ampere's law for straight wire, loop, solenoid, toroid, current sheet; Magnetic moment, magnetic force and torque on a circuit.
- Solve the multipole expansion of potential and field; Material media, boundary conditions; Dielectric sphere in uniform field; Susceptibility and polarizability, and apply to molecular model.
- Estimate time varying fields; scalar and vector potentials, gauge invariance, wave equations and to solve Poynting theorem.

**Programme M.Sc. Physics Semester I&II**  
**Course Outcomes of 2PHY2: Quantum Mechanics-II**

Upon completion of the course successfully, students would be able to



- Derive from first principles, the expression for the first and second order energy shifts due to a perturbation for the non-degenerate and degenerate states and use this expression for obtaining fairly accurate energies corresponding to these states of perturbed systems;
- Solve the time dependent perturbation problems for quantum systems and predict the consequences; understand the possibility stimulated emission in the atomic systems as a result of interaction with the electromagnetic radiation.
- Understand the quantum theory of scattering and apply it to gain the knowledge about low and high energy physics scattering phenomenon.
- Construct the wave functions for the systems of identical particles; relate the symmetry property of the wave function to the spin of the particles (Bosons and Fermions) and applicability of Pauli's exclusion principle.
- Explain the KG equation and Dirac's equation (relativistic wave equations) and its free-particle solutions; be able to explain the KG equation (relativistic wave equation) and its free-particle solutions.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes of 2PHY3 Solid State Physics**

Upon completion of the course successfully, students would be able to

- Describe Single Crystal and Poly Crystals, Crystal Symmetry, Symmetry Elements, Crystal Types, Bravais Lattices.
- Use different X-ray techniques.
- Interpret the Powder Photograph; Bernal Chart; Brillouin Zones.
- Discuss the inter-Atomic Forces Cohesive Energy of a Solid; Infrared Absorption by Ionic Crystal Lattice; anharmonicity and thermal Expansion.
- Study the Dulong and Petit Law, Lattice Specific Heat, Einstein and Debye Theories, Electronic and Lattice Contributions to Specific Heat.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes of 2PHY4 (i): Network Theorems and Solid State Devices**

Upon completion of the course successfully, students would be able to

- Analyze the circuits using Kirchhoff's law and network simplification theorems.
- Explain and understand the physical concepts underlying the operation of semiconductor devices; have ability to design and analyze simple FET and MOSFET amplifier circuits.
- Design and analyze simple rectifiers and voltage regulators using diodes; have ability to design and analyze simple circuits using semiconductor switching devices like triac, diac and SCR.
- Design and analyze simple BJT amplifier circuits; design and analyze simple BJT oscillator and multi-vibrator circuits.

- Understand the construction, working and uses of various transducers; understand the construction and operation of basic measuring instruments.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes Of 2PHY4 (ii): LASERS AND LASER APPLICATIONS**

Upon completion of the course successfully, students would be able to

- discuss the Spontaneous emission, Stimulated emission, Population inversion, Fabry Perot etalon.
- analyse Two level laser system, Threshold for three and four level laser systems.
- apply solid state lasers, Semiconductor lasers, High power laser systems.
- apply Raman scattering; Non-linear interaction of light with matter; Laser induced multi-photon processes.
- apply Ultra high resolution spectroscopy; Optical fibers; Light wave communication and material processing.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes of 2PHY5- Lab on Solid State Physics**

Upon completion of the course successfully, students would be able to

- organize and assemble
  - Experiments on Laser/ Solid State Physics
  - Experiments on Modern Physics
  - Experiments on Nuclear Counters
- perform data acquisition using assembled experiment.
- engage in experimental troubleshooting with teaching assistants.
- identify sources of error and fluctuations in the collected data.
- construct graph on graph paper and also using computer based the collected data.
- analyze the collected data.
- distinguish between theoretical predictions and experimental measurements.
- verify the fundamental laws of Modern Physics.

### **Programme M.Sc. Physics Semester I&II**

#### **Course Outcomes of 2PHY6- Lab on Electronics**

Upon completion of the course successfully, students would be able to

- analyze the characteristics of different electronic devices such as diodes, transistors etc., and design simple circuits like rectifiers, amplifiers etc.
- measure voltage, frequency and phase of any waveform using CRO.
- generate sine, square and triangular waveforms with required frequency and amplitude using function generator.
- engage in experimental troubleshooting of electronic circuit.

## **Department of Electronics**

### **Programme Outcomes and Programme Specific Outcomes**

#### **Program Outcomes (POs):**

At the end of the programme, students would be able to

- 1) Utilize the basic knowledge in Electronics science.
- 2) Identify electronic components and ICs.
- 3) Design system components that meet the requirement of public safety and offer solutions to the societal and environmental concerns
- 4) Apply research based knowledge to design and conduct experiments
- 5) Construct, choose and apply the techniques, resources and modern electronics tools required for Electronics applications.
- 6) Apply the contextual knowledge to assess societal, health, safety and cultural issues and endure the consequent responsibilities relevant to the professional electronics practice.
- 7) Examine the impact of electronics solutions in global and environmental contexts and utilize the knowledge for sustained development.
- 8) Develop consciousness of professional, ethical and social responsibilities as experts in the field of Electronics and Communication.
- 9) Perform effectively as a member/leader in multidisciplinary teams.
- 10) Demonstrate resourcefulness for contemporary issues and lifelong learning.

#### **Program Specific Outcomes:**

Upon completion of the programme successfully, students would be able to

1. acquire knowledge in fundamental aspects of all branches of Electronics
2. create inquisitiveness and problem-solving skills
3. apply the principles of Electronics in solutions to real world problems
4. get prepared for higher education and career in Electronics
5. develop skills in the proper handling of apparatus and components
6. apply Electronics in their day to day life
7. act as a responsible citizen
8. Select and apply cutting-edge engineering hardware and software tools to solve complex Electronics

and Communication Engineering problems

9. Apply the fundamental concepts of electronics and communication science to design a variety of components.

## **B. Sc. Electronics I Semester –I**

### **Course outcomes of Basic Electronics**

**Cos**

#### **Unit I : Passive Components and Network –**

At the end of this unit, students will be able to know passive and active components, analysis and verification of network theorems with numericals. Also students will be able to select and identify electronic components such as resistors capacitors etc. of required value.

#### **UNIT II: Measuring Instruments :**

After this unit, students will be able to understand principle and working of different meters and CRO . They will be able to handle and connect the measuring instruments such as Voltmeter, Ammeter etc. at appropriate place

#### **Unit III: Semiconductor Diode and Regulated power supply:**

At the end of this unit, students will be able to know function of diodes, rectifiers and voltage regulators. They will be able to design simple dc power supply.

#### **Unit IV: Bipolar Transistors:**

After completion of this unit, students will be able to know types transistor and their working in different modes, amplification and biasing, faults detection in electronic circuits. Also they will be able to design and construct simple amplifiers.

#### **Unit V: Switching and Optoelectronic devices :**

At the end of this unit, students will be able to know Switching and Optoelectronic devices and their working. They will be able to use these active devices for many applications.

#### **Unit VI: Integrated Circuits:**

After completion of this unit, students will be able to know design and fabrication process of ICs and their scale of integration.

## **B. Sc. Electronics I Semester –II**

### **Course outcomes of Digital Electronics**

**COs**

#### **Unit I: Binary Arithmetic & Logic gates :**

After completion of this unit, students will be able to know number systems and binary codes, their interconversion and arithmetic, logic gates, use of logic gates in adders. They will be able to design and construct logic circuits using logic gates.

### **Unit II: Boolean Algebra & Logic families:**

At the end of this unit, students will be able to understand Boolean algebra, De’Morgan’s theorem, logic equations, K-map and logic families like DTL,TTL etc. They will be able to minimise logic equation, design and construct logic circuits using logic gates.

### **Unit III: Multivibrators and Flip Flops:**

At the end of this unit, students will be able to know construction and working of multivibrators and flip-flops. Also they will be able to design and construct different types of flip-flops using logic gates.

### **Unit IV: Counters and Shift registers:**

At the end of this unit, students will be understand the construction and working of different types of counters and shift registers and their IC version. They will be able to design and construct different types of counters and shift registers using flip-flops and logic gates.

### **Unit V: Combinational logic circuit:**

After this unit, students will be know the construction and working of different types of encoders, decoders, multiplexers and demultiplexers and their IC version. They will be able to design and construct different types of encoders, decoders, multiplexers and demultiplexers using logic gates.

### **Unit VI: Semiconductor Memories:**

At the end of this unit, students will be able to know different types of memories and their working. They will be able to access these memories in serial and parallel mode (to read and write operations).

## **Course outcomes of B. Sc. Electronics**

### **B. Sc. II Semester –III and IV**

Students will able to

- Understand the concept of feedback, amplifier, oscillator , operational amplifier and application, A/D and D/A convertor, its need and characteristic, combinational logic circuit
- Understanding the 8085 microprocessor and communication system in which students study the architecture and timing sand programming of 8085, interfacing modulation and demodulation, generalization of AM and FM, transmitter and receiver, pulse modulation and digital communication

## **Course outcomes of B. Sc. Electronics**

### **B. Sc. III Semester –V and VI**

Students will able to

- Have the knowledge about the basic instrumentation, measurement of temperature, timer and PLL
- Understand the display, digital instrument and recorder, sensor and actuators, biomedical electronics
- Study the advanced microprocessor and microcontroller and know the 8086 architecture, programming of 8086,
- Understanding the 8051 microcontroller architecture, its instruction set and programming, 8051 interfacing and applications.

### **Name of the Programme: B. Sc. Chemistry**

### **Programme Outcomes and Programme Specific Outcomes**

#### **POs:**

At the time of graduation, Students would be able to

**PO1.**Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO2.**Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

**PO3.** Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO4.** Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

**PO5.** Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

**PO6.** Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

**PO7.** Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

### **PSOs:**

Upon completion of the programme successfully, the learners would be able to

1. Understand the scope, methodology and application of modern chemistry.
2. Apply theoretical and practical concepts of instruments that are commonly used-in most chemistry field.
3. Plan and conduct scientific experiments and record the results of such experiments.
4. Get acquainted with safety of chemicals, transfer, and measurements of chemicals, preparation of solutions, and using physical properties to identify compounds and chemical reactions.
5. Describe how chemistry is useful to solve social, economic and environmental problem and issues facing our society in energy, medicine, and health.

### **B. Sc. Chemistry I Semester –I**

#### **Course outcomes of CHE (1S) T Chemistry 1S**

Students will able to

- Solve the conceptual questions using the knowledge gained by studying periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements.
- Apply concepts of acids and bases as well as non-aqueous solvents and their industrial usage.
- Compare different reaction intermediates, functional group chemistry through the study of methods of preparation, properties and chemical reactions with underlying mechanism.
- Choose correct synthetic approach to prepare derivatives of industrially important molecules
- Solve different numerical problem of varying difficulty associated with gaseous and liquid state.
- Apply the concepts from advanced mathematics to solve the derivation of different chemical formulae.
- Create models associated with periodic table
- Associate reaction intermediates and functional group chemistry with different types of reaction mechanisms.
- Solve numerical problem associated with gaseous and liquid state.

### **B. Sc. Chemistry I Semester –I**

#### **Course outcomes of CHE (1S) PR Chemistry 1S**

#### **COs**

At the end of Lab/Practical course, students would be able to

- Synthesise different types of organic compounds.
- Perform the process of filtration, crystallization, melting point, waste management.
- Understand the effect of orientation effect of a group
- Skillfully determine the surface tension, viscosity of liquid.
- Predict the endothermic or exothermic process from heat of solution of a salt.

### **B. Sc. Chemistry I Semester –II**

#### **Course outcomes of CHE (2S) T Chemistry 2S**

##### **COs**

By the end of this course, the students would be able to:

1. apply the knowledge gained by studying types of bonding, solvation, hybridization and molecular geometries.
  2. Draw the correct molecular structures, bond order and bond length.
  3. synthesize commercially important compounds of varying carbon backbone.
  4. Choose correct synthetic approach to prepare derivatives of industrially important molecules.
  5. Solve numerical problems related to crystalline state.
  6. Acquire skills to use chemical kinetics to develop mechanism of chemical reactions.
1. Create models associated with molecular geometries, hybridization, MO diagrams.
  2. Develop synthetic routes for halo benzenes and benzyl halides.
  3. Solve numerical problems associated with crystalline state and chemical kinetics.

### **B. Sc. Chemistry I Semester –II**

#### **Course outcomes of CHE (2S) PR Chemistry**

At the end of Lab/Practical course, students would be able to -

- Analyse the given organic compound qualitatively by different tests.
- Prepare the derivative of the provided substance.
- Illustrate the practical skills in volumetric analysis.
- Differentiate types of titrations e.g. acid-base, redox, etc.
- Comprehend the kinetics of reactions and interpret the experimental data.
- Calculate, communicate and analyse the result.

#### **Course outcomes of B. Sc. Chemistry**

##### **B. Sc. II Semester –III**

Students will able to

- Understand the concept of covalent bonding, metallic bonding
- Know free electron theory, Valence bond theory and molecular orbital theory



- Understand concept of volumetric analysis
- Have an information regarding gravimetric analysis
- Get the information of different of aldehyde and carboxylic acid
- Understand the terms Optical isomerism and conformational isomerism
- Know meaning of resolution ,enantiomers Diastereomers, R and S Configuration
- Understand the concept of liquid state surface tension, Viscosity
- Understand measurement application of surface tension and viscosity
- Understand principal of redox titration during practicals
- Know importance of water, measurement of different parameters
- Develop skill based aptitude among the students
- Performs redox titration, iodometry and iodimetric titration
- Develop skill force construction of phase diagram.
- Develop laboratory skill for study order of reaction

### **Course outcomes of B. Sc. Chemistry**

#### **B. Sc. II Semester –IV**

Students will able to

- Knowledge about 3d transition series elements
- Get the knowledge of metallurgy
- Understand inner transition elements
- Understand the chemistry of reactive methylene group
- Inculcate importance of carbohydrate
- Acquire importance of amino acids, diazonium salt and proteins
- Know the importance of colligative properties
- Understand crystalline state by using different models
- Know various parameters of water like hardness of water and its estimation
- Estimation of  $\text{KMnO}_4$  colorometrically and also copper
- Determination of equivalent weight of organic acid

### **Course outcomes of B. Sc. Chemistry**

#### **B. Sc. III Semester –V**

Students will able to

- Understand Werner's formulation of complexes and identify the type of valencies
- Get importance of electronic spectra of transition series elements
- Solve numerical on crystal field theory
- Have the knowledge of various drugs their synthesis and application
- Knowledge about various pesticides and herbicides
- Acquaint about mode of action of drugs on various diseases
- Understand different terms Lambert's law Beer's law, Quantum yield, Fluorescence, phosphorescence

- Derive expression for rotational spectra, vibrational spectra, band spectra
- Solve numerical on rotational and vibration spectroscopy
- Know idea for preparation of complexes like tetra mine Cu(II) sulphate, hexamine Ni(II) chloride, Prussian blue, Sodium thiosulphate
- Perform titration and estimation by conductometry, potentiometric, polarimetrically

### **Course outcomes of B. Sc. Chemistry**

#### **B. Sc. III Semester –VI**

Students will able to

- Knowledge of different reaction SN1 and SN2 substitution reaction
- Understand various concept of beers law verification, expressions
- Understand chromatography types
- Know the role Na ,K, Ca, Mg haemoglobin myoglobin in biological system
- Understand different spectroscopic terms In electronic spectroscopy chromophore, auxochrome bathochromic shift, hypsochromic shift
- Know application of electronic spectra for dienes unsaturated aldehydes and ketones, aromatic compound
- Understand concept of NMR, Mass spectroscopy and their application in structure determination
- Determination pH of solution by using hydrogen ,glass, quinhydrone electrode
- Understand different terms of nuclear chemistry Shell model, liquid drop model, meson theory
- Knowledge about nuclear fusion and fission, Q value
- Know the application of radioisotope in industries agriculture and medicine
- Know the idea to perform various titration formaldehyde, ascorbic acid, phenol, aniline, urea
- Develop skill based practicals like separation of mixtures of dyes
- To develop titration skill for conductometry, potentiometry , pH metry.
- Verify lamberts beers law by using colorimeter.

#### **Name of the Programme: M. Sc. Chemistry**

#### **Programme Outcomes and Programme Specific Outcomes**

##### **Program Outcomes**

By the end of the Programme, students would be able to

**PO1** Deep subject Knowledge and intellectual breadth Apply the subject knowledge to the solution of real-world problems.

**PO2 Professional Ethics** Apply ethical principles and commit to professional ethics and responsibilities and norms of the standard practices.

**PO3 Creative & Critical Thinking** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO4 Innovation, Research and Problem Solving** Identify, formulate, review research literature, and analyze complex problems reaching substantiated and innovative conclusions. Design solutions for complex problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Use research-based knowledge and research methods to provide valid conclusions. Demonstrate the knowledge of, and need for sustainable development.

**PO5 Team work and Communication Skills** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Present/communicate research at national/international level, write effective articles, reports and design documentation, make effective presentations, and give and receive clear instructions. Communicate disciplinary knowledge to the community and broader public.

**PO6 Professionalism and Leadership Readiness** Demonstrate personal accountability and effective work habits, e.g., punctuality, working productively with others, and time as well as workload management. Demonstrate integrity and ethical behavior, act responsibly with the interests of the larger community in mind, and to learn from his/her mistakes. Use the strengths of others to achieve common goals, and use interpersonal skills to coach and develop others. Assess and manage his/her emotions and those of others; use empathetic skills to guide and motivate; and organize, prioritize, and delegate work.

**PO7 Lifelong learning** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

**PO8 Competence for Digital World** Prepare well for living, learning and working in a Digital Society; Create, select, and apply appropriate techniques, resources, and modern ICT tools to complex activities with an understanding of the limitations. Use existing digital technologies ethically and efficiently to solve problems, complete tasks, and accomplish goals. Demonstrate effective adaptability to new and emerging technologies.

**PO9 Global Citizenship** Act with an informed awareness of global issues. Engage in initiatives that encourage equity and growth for all.

#### **Program Specific Outcomes:**

On completion of M.Sc. Chemistry programme, graduates would be able to:

PSO-1: observe, analyze and interpret chemical phenomena and process

PSO-2: design and develop new molecules/processes with industrial and societal applications

PSO-3: formulate new ideas/concepts in chemical sciences and test them

PSO-4: communicate effectively the principles and practice of chemical sciences

PSO-5: address issues of environment, health and development from a chemical perspective

PSO-6: follow professional ethics in all spheres of activity

PSO-7: function effectively as a member/leader in diverse teams/groups

PSO-8: engage in independent learning in the broadest context of scientific advancement.

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Inorganic Chemistry**

**Course Outcomes:** At the end of the course students would be able to

- predict the nature of bond and its properties through various electronic structural methods; bonding models
- recognize and assign symmetry characteristics to molecules and objects,
- understand and analyze structure-property correlation of coordination compounds
- correlate magnetic properties of complexes with strength of ligand field
- design new coordination compounds based on a fundamental understanding of their electronic properties
- appreciate specialized and advanced topics in inorganic and coordination chemistry
- Correlate structure and bonding with reactivity of boron clusters
- analyze ligation of diatomic ligands with metals.

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Organic Chemistry**

**Course Outcomes:** At the end of the course students would be able to

- Implement rules of aromaticity to organic molecules
- Sketch organic molecules in different projection formula and assign its configuration.
- Apply their understanding about the organic reactions of industrial significance with respect to the chemoselectivity, regioselectivity and enantioselectivity.
- Analyze the product distribution and the stereochemistry of various organic products.
- Evaluate the organic reactions based on the influence of the substituents on substrate molecules
- Design organic reactions in order to achieve the required product(s)

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Physical Chemistry**

**Course Outcomes:** At the end of the course students would be able to

- Understand basic concepts and theories for quantum mechanics, surface chemistry, thermodynamics and electrochemistry

- Apply the concepts of quantum mechanics to solve higher order problems associated with shapes, size and energy of atomic entities.
- Develop the methodologies to identify and use colloidal substances and micelles.
- Implement and build theoretical and experimental processes using thermodynamics and electrochemical concepts
- Solve numerical problems associated with quantum mechanics, thermodynamics, and electrochemistry

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Analytical Chemistry-I**

**Course Outcomes:** At the end of the course students would be able to

- Appraise specific analytical technique based on sample and target analyte
- Develop analytical ability and critical thinking in selection of statistics and their use in making interpretation meaningful and productive.
- Understand the principles of chromatographic techniques.
- Select proper chromatographic technique among the available techniques.
- Correlate the use of indicator used in different types of titration
- Explore electroanalytical techniques based on conductance and emf measurements.
- Design buffer systems of the required pH

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Ability Enhancement Course on DSC CY102: 01**

After completion of this course successfully, the students would be able to

1. Provide basic insights into concept of resonance and three dimensional arrangement of molecules
2. Draw and compare the significant resonance contributor, help to assign the correct configuration
3. Draw and name structure using structure drawing software
4. Prepare and present report on a particular topic
5. Develop imagination of molecule in three dimensional space.

## **M. Sc. Chemistry Semester –I**

### **Course outcomes of Physical Chemistry**

**Course Outcomes:** At the end of the course students would be able to

- Select the proper indicator for a titration
- Improve scientific skill of data collection and analysis.

- Create methods for estimation of concentration of electrolytes in mixture using potentiometry.
- Correlate nature of graphs in conductometric titrations
- Get awareness about laboratory skills of handling electroanalytical instruments.
- Apply concept of critical micellar concentration to cleaning power of detergents.

### **M. Sc. Chemistry Semester –I**

#### **Course outcomes of CY107 Organic Chemistry (Lab-02)**

**Course Outcomes:** At the end of the course students would be able to

- Design the methodologies to develop ecofriendly and green technology for industry and research.
- Develop methods and remedies for reactions with environmental pollution.
- Improve scientific practical information orally and in writing.
- Get awareness about laboratory safety and handling of chemicals.
- Apply different purification techniques recrystallization, thin layer chromatography, distillation and solvent extraction.

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of CY201 Advanced Inorganic Chemistry**

**Course Outcomes:** At the end of the course, student would be able to

- recollect the principles of electronic structure, bonding and reactivity of coordination complexes
- understand the concept of synthesis and stability of transition metal organometallic complexes
- develop the possible catalytic pathways leading to desired products
- apply the principles of transition metal coordination complexes in understanding functions of biological systems
- identify the medicinal applications of inorganic compounds

unravel and interpret the photochemical properties of coordination complexes

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of CY202 Organic Reaction Mechanism**

**Course Outcomes:** At the end of the course students would be able to

- Predict the orientation and stereochemistry of the product of addition reaction
- Predict the orientation and stereochemistry of the product of elimination reaction
- Apply enolate chemistry to achieve molecular complexity
- Design organic reactions in order to achieve the required product (s).
- Formulate green chemistry synthesis to increase atom economy

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of CY203 Physical Chemistry-II**

**Course Outcomes:** At the end of the course students would be able to

- Understand basic and advanced level statistical thermodynamics, reaction kinetics, photochemistry and nuclear-chemistry
- Apply the concepts of statistical thermodynamics and reaction kinetics to solve complex problems.
- Demonstrate the ability to use chemical dynamics to solve problems associated with enzyme kinetics, fast reactions and complex reactions
- Implement and build theoretical models for reaction rates, thermodynamics and nuclear phenomena
- Solve numerical problems associated with statistical thermodynamics, reaction kinetics, photochemistry and nuclear chemistry

## **M. Sc. Chemistry Semester –II**

### **Course outcomes of CY204 Analytical Chemistry-II**

**Course Outcomes:** At the end of the course students would be able to

- Select most suitable modern chromatographic technique for separation of analyte from matrix.
- Explain various types of columns and detectors used in chromatography.
- Determine pK<sub>a</sub> value of indicator using potentiometry
- Summarize principles and applications of molecular absorption and molecular emission spectroscopy
- Design experiments based on spectro photometry and polarographic analysis.
- Apply the principle involved in radio analytical techniques and instrumentation therein.
- Formulate experiments based on optical and electro analytical techniques.

## **M. Sc. Chemistry Semester –II**

### **Course outcomes of Ability Enhancement Course on DSC: 02**

1. correlate concept of pK<sub>a</sub> to predict the reaction mechanism
2. apply the basic operations of spreadsheet applications
3. operate various Chemistry software with advanced functions
4. prepare and present report on a particular topic

## **M. Sc. Chemistry Semester –II**

### **Course outcomes of CY206 Physical Chemistry (Lab03)**

**Course Outcomes:** At the end of the course students would be able to

- Apply knowledge to determine reaction rate of chemical reactions
- Create methods for estimation of concentration of electrolytes in mixture using potentiometry.
- Correlate nature of graphs in conductometric titrations
- Improve skill to perform experiment in electroanalytical methods
- Correlate structure property relationship of conjugated systems
- Design conjugated polymer of desired optoelectronic property.

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of CY207 Inorganic Chemistry (Lab-04)**

**Course Outcomes:** At the end of the course students would be able to

- apply knowledge to develop method for qualitative identification elements from the mixture having applications in industry and research
- create methods for estimation of element/metal from the complexes.
- improve skill for separation identification and removal of interfering radicals
- get idea about development of spot test for the different elements.
- Understand importance of metal complexes and green methods for the synthesis.

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of General Interest Course :01 Chemistry for All (02 Credit)**

**Course Outcome:** After completion of this course successfully, the students would be able to.....

1. grasp basic insights into concept of atoms and molecules
2. understand Periodic Table trends and functional groups;
3. correlate concept of properties of elements, chemical reactivity and stability.
4. correlate Chemistry with the process of photosynthesis and pollution.
5. apply concepts of chemistry to biomolecules and functions of drugs inside the body.

### **M. Sc. Chemistry Semester –II**

#### **Course outcomes of General Interest Course: 02**

#### **History of Chemistry in ancient and Medieval India (02 credit)**

**Course objective:** Main objective is to highlight the development of chemistry and alchemy in ancient India.

**Course Outcome:** After completion of this course successfully, the students would be able to

1. understand application of science & technology in ancient Indian civilization
2. get insight of Indian Contribution to World in Chemistry
3. correlate ancient health management systems through home remedies



4. apply concepts of Indology of chemistry to biomolecules and functions of drugs inside the body.

### **M. Sc. Chemistry Semester –III**

#### **Course outcomes**

Students will able to

- Know the unifying principle, microwave spectroscopy, reactivity and characteristic of nanoparticles
- Have the knowledge about ultraviolet and visible spectroscopy, infrared spectroscopy,
- Know the mass spectroscopy
- Know the nuclear magnetic spectroscopy, carbon NMR spectroscopy
- Understand the characterization of organic molecules
- Understand the thermal methods of analysis and thermal titrations, thermometric titrations
- Study the electroanalytical methods, high frequency titrations, electrogravimetry, coulometry
- Have the knowledge about the chemical, biochemical and biosensors, ion-selective electrode
- Study the electroanalytical technique , polarography, voltammetry and related technique
- Know the bio-analytical chemistry, application of spectrophotometry, ultracentrifugation, gel electrophoresis
- Study the organic chemistry in which students knows the oxidation-reduction
- Polynuclear hydrocarbons, construction of ring systems, non aromatic heterocycles
- Understand the formation of C-C bond principle, electrophilic and non-electrophilic carbon species, use of acetylides acid catalysed condensation of olefins FC reaction, Fries reaction
- Know the umpolung concept, phosphours and sulphur ylide, enamines
- Study the selective organic name reaction, modern synthetic methods
- Know the carbohydrates, lipids, amino acids, proteins and peptides, enzymes
- Know the alkaloids and terpenoids, biosynthesis of terpens, alkaloids
- Know the steroids and hormones, prostaglandins, pyrethoids, rotenones and pheromones
- Understand the classification, occurrence of chemistry of vitamins A, C, D, E and K, B<sub>12</sub> , B<sub>1</sub> B<sub>6</sub> etc and natural pigments

### **M. Sc. Chemistry Semester –IV**

#### **Course outcomes**

Students will able to

- Know the Raman spectroscopy, classical and quantum theories of Raman effects, photoelectron spectroscopy
- Understanding the X-ray diffraction, electron diffraction, neutron diffraction
- Know the electron spin resonance spectroscopy, Mossbauer spectroscopy
- Study the determination of structures of complex organic molecule by spectroscopic means, problems based on IR, PMR,  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR data and structure determination of organic molecules/inorganic compounds
- Have the knowledge about the radiochemical methods of analysis, neutron activation analysis, isotropic dilution analysis (IDA), radiometric titration
- Understanding the molecular photofluorescence and phosphorescence
- Know the optical methods and flow injection analysis
- Know the food and cosmetic analysis, the chemical analysis of food, analysis of cosmetics, analysis of face powder, analysis of deodorants and antiperspirants
- Understanding the forensic and fuel analysis
- Study the applied and medicinal chemistry in which students know the mechanism of polymerization, dyes agrochemicals such as, carbamate pesticides, organophosphorous pesticides, plant growth regulators
- Have a knowledge about the general aspects of drug, drug design, classification of drug,
- Understanding the application of organometallics in organic synthesis, organometallic reagents, organo transition metal reagents, metallocenes
- Understand the designing the synthesis based on retrosynthetic analysis, ring synthesis
- Have the knowledge about the protection and deprotection of functional groups, phase transfer catalysis, heterocyclic compounds

## **Programme B. Sc. Botany**

### **Programme outcomes and specific programmes outcomes**

#### **POs:**

The students graduating with the degree B.Sc. with Botany will be able to

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

### **PSOs:**

Upon completion of the programme successfully, students would be able to

1. Identify major groups of plants and compare the characteristics of lower ( microbes, algae ,fungi, bryophytes and pteridophytes) and higher ( Gymnosperms and angiosperms).
2. use evidence based comparative botany approach to explain the evolution of organism and understand the genetic diversity.
3. explain various plant processes and functions, metabolism, concepts of gene, genome and how organism's function is influenced at the cell, tissue and organ level.
4. understand adaptation, development and behavior of different forms of life.
5. demonstrate the experimental techniques and methods of their area of specialization in Botany.

### **B.Sc. Botany I Semester –I**

#### **Course outcomes of BOT (1S)/Botany DIVERSITY Of MICROBES , PHYCOLOGY, MYCOLOGY AND PHYTOPATHOLOGY**

After completion of this course successfully , the students would be able to

- understand microbial diversity, reproduction and economic importance.
- differentiate the microbes, algae and fungi on the basis of morphology, cellular organization, nutrition and metabolic activities.
- classify and identify the various algal genera.
- classify and identify the various fungal genera.
- Systematize the plant diseases and their pathogens
- Apply understanding of microbial diversity, phycology and mycology for teaching primary to high school students.

## **B.Sc. Botany I Semester –I**

### **Course outcomes of skill enhancement module**

- Acquire skill of isolation of Arbuscular Mycorrhizal Fungal and also able to
- classify the various species of mycorrhiza.
- Evaluate the AMF spore in the soil sample of crop plants.
- Establish own production unit of mushroom cultivation
- Asses the economy of mushroom cultivation
- Diagnosed the local crop diseases.
- Advise the proper fungicides or other measures to prevent crop diseases.

## **B.Sc. Botany I Semester –I**

### **Course outcomes of BOT(1S)/BOTANY Practical 2**

After completion of this course successfully , the students would be able to

- Identify and classify the algae on the basis of morphology and other characters.
- Create monograph of Algae and Fungi.
- Demonstrate the structural details of viruses and bacteria included in practical work.
- Evaluate the plant diseases of local plants and diagnosed the diseases on the basis of symptomatology.

## **B.Sc. Botany I Semester –II**

### **Course outcomes of BOT( 2 S)/Botany Bryophytes, Pteridophytes, Gymnosperms and Morphology of Angiosperms**

After completion of this course successfully , the students would be able to

- demonstrate on understanding of Archegoniate, Bryophytes, Pteridophytes and Gymnosperms.
- identify and classify plants from Bryophytes, Pteridophytes and Gymnosperms.
- develop critical thinking on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
- acquire skill of collection and preservation of Bryophytes, Pteridophytes and Gymnosperms.
- Understand the herbal technology.
- Develop the skill for cultivation of plants.
- Acquire the skill of morphological and microscopic examination of herbal plants.
- List the major herbs, their Botanical names and chemical constituent's.

## **B.Sc. Botany I Semester –II**

### **Course outcomes of BOT(2S)/Botany Bryophytes, Pteridophytes, Gymnosperms and Morphology of Angiosperms, Utilization of Plants**

By the end of the Lab/Practical Course, generally students would be able to:

- Understand forms of Bryophytes, Pteridophytes and Gymnosperms.
- Acquire the skill of preparation of slides of plant body and reproductive organs.

- Classify and identify different plant parts on the basis of external morphology.
- Describe the plants in technical language.
- develop critical understanding on morphology, botanical names and cultivation practices of economically important plants.

### **B.Sc. Botany I Semester –II**

#### **Course outcomes of Ethnobotany and Ethnopharmacology**

After completion of this course, student would be able to

1. Appreciate the need to conserve floristic and cultural diversity of the region.
2. Rescue and document Ethno botanicals for sustainable use of plant resources.
3. Understand the need for development of new drugs for safe and more rational use of herbal preparations.
4. develop laboratory skills in testing of herbal drugs and new commercial products.

#### **Course Outcomes**

#### **B. Sc. Botany (Sem III- Sem VI)**

Students will able to

- Understand plant diversity, study of algae, bryophytes, fungi, pteridophytes, mechanism of reproduction in plants and microbes responsible for plant diseases and economic losses
- Study gymnosperm classification, plant morphology such as study of roots, stem and leaves, Inflorescence, economic botany and the role of plants as a medicine, food, condiments etc
- Understand the basis for classification of plants; plant taxonomy; plant families; plant anatomy and embryological study of the plants
- Know basic cell biology, cellular contents, chromosomal study, mechanism of inheritance; effects due to chromosomal changes
- Understand the basic physiology of plants as how a plant can prepare its own food material; how it can respire; Nutrition mechanism, Role of hormones in growth and development of plants; flowering mechanism, plant movements, ecology and ecosystem
- Molecular mechanism of DNA Replication and protein synthesis. Genetic engineering of the cell in order to create the new hybrid ones; new aspects in biological science and plant tissue culture mechanism for the conservation of rare plants

#### **Programme M. Sc. Botany**

#### **Programme outcomes and specific programmes outcomes**

## **POs**

By the end of the programme, students would be able to

**PO1 Deep subject Knowledge and intellectual breadth** Apply the subject knowledge to the solution of real-world problems.

**PO2 Professional Ethics** Apply ethical principles and commit to professional ethics and responsibilities and norms of the standard practices.

**PO3 Creative & Critical Thinking** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO4 Innovation, Research and Problem Solving** Identify, formulate, review research literature, and analyze complex problems reaching substantiated and innovative conclusions. Design solutions for complex problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Use research-based knowledge and research methods to provide valid conclusions. Demonstrate the knowledge of, and need for sustainable development.

**PO5 Team work and Communication Skills** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Present/communicate research at national/international level, write effective articles, reports and design documentation, make effective presentations, and give and receive clear instructions. Communicate disciplinary knowledge to the community and broader public.

**PO6 Professionalism and Leadership Readiness** Demonstrate personal accountability and effective work habits, e.g., punctuality, working productively with others, and time as well as workload management. Demonstrate integrity and ethical behavior, act responsibly with the interests of the larger community in mind, and to learn from his/her mistakes. Use the strengths of others to achieve common goals, and use interpersonal skills to coach and develop others. Assess and manage his/her emotions and those of others; use empathetic skills to guide and motivate; and organize, prioritize, and delegate work.

**PO7 Lifelong learning** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

**PO8 Competence for Digital World** Prepare well for living, learning and working in a Digital Society; Create, select, and apply appropriate techniques, resources, and modern ICT tools to complex activities with an understanding of the limitations. Use existing digital technologies ethically and efficiently to solve problems, complete tasks, and accomplish goals. Demonstrate effective adaptability to new and emerging technologies.

**PO9 Global Citizenship** Act with an informed awareness of global issues. Engage in initiatives that encourage equity and growth for all.

## **PSOs:**

After completing the programme successfully, students would be able to

1. explore the cutting edge technologies and skills currently used in plant sciences.
2. Be aware of social, environmental issues and plant significance in natural interest.
3. create interest in nature conservation and save the natural resources.
4. study the concepts of genetics, plant breeding and their applicability.
5. understand and correlate the various biochemical and physiological processes in plants.
6. study the evolutionary process in Bryophytes and Pteridophytes.
7. study the bioactive principles in plants and their defence mechanisms.

### **M.Sc. Botany I Semester –I**

#### **Course outcomes of Cell and Molecular Biology**

Upon completion of this course successfully, students would be able to

- understand structural organization and functional role of cell, organelles and biomolecules.
- correlate the various life processes and their functioning.
- understand the process of chromosomal organization and its role in cellular metabolism.
- evaluate the various life processes and their regulations with special reference to regulation of gene expression.
- Develop strong fundamental basics of cell dynamics.
- They would be able to analyze and interpret the cell behavior, cell cycle and cell communication processes.
- They would be able to predict disorders within the biological systems related to gene regulation.
- They would be able to illustrate and justify the biological mechanisms
- Able to explain the structure, synthesis and processing of Nucleic acids.

### **M.Sc. Botany I Semester –I**

#### **Course outcomes of AEC I Molecular Techniques 01**

Upon completion of this course successfully, students would be able to

- Upon completion of this course successfully, students would be able to Get acquainted about the latest techniques used in plant sciences Be trained about the tools and techniques.
- know the principle and applications of these techniques.
- Become expert in laboratory preparation as well as chemical preparations of different concentrations.
- apply various formulas in preparations of reagents and are aware of their properties.
- Apply various techniques at appropriate places as per required.
- standardize the process and techniques on basis of knowledge.
- Analyze and interpret the results with accuracy.

## **M.Sc. Botany I Semester –I**

### **Course outcomes of DSC II Evolution and Diversity of Algae and Fungi**

Upon completion of this course successfully, students would be able to

- Understand the phycology with special reference to Indian work.
- Identify Algae in diversified habitats (Terrestrial, fresh water, marine) Criteria used in classification of algae, Role of algae in human welfare
- Know General account of thallus organization, reproduction and life history of algae.
- Study important groups of algae Cyanophyta, Chlorophyta, Charophyta, Xanthophyta, Bacillariopyta, Phaeophyta & Rhodophyta.
- Study General Characters of Fungi Classification., Economic importance of fungi in medicine, Use Algae and fungi in Agriculture (Biopesticide and biofertilizer) & Fungi as plant pathogen.

## **M.Sc. Botany I Semester –I**

### **Course outcomes of DSC III Economic Botany and Resource Utilization**

Upon completion of this course successfully, students would be able to

- Study the origin, divarication, utility and conservation strategies & natural resources
- Study importance of food, fiber, medicines & oil yielding plant.
- Study the plants and their value in the service & mankind.
- Study the conservation of biodiversity
- Understand the pattern origin diversification and cultivation & plant in nature.
- Know about origin and cultivation and various economically importance crop plants.
- apply the strategies for conservation of biodiversity.
- become well-versed with the plants utilized by human race

## **M.Sc. Botany I Semester –I**

### **Course outcomes of DSC IV Plant Development**

Upon completion of this course successfully, students would be able to

- Deal with regulation of growth and development of plants in relation to bio-molecular interaction.
- know the various structural and anatomical components of plant tissue and reproductive parts.
- Understand Structure and development of Flower, Male gametophyte, Female gametophyte, Seed development, dormancy.
- Know about plant anatomical structure, their developmental patterns.
- Identify plant reproductive parts development of male, female gametophytes, seed and fruits.
- Know anomalous Secondary Growth.
- Apply the knowledge of anatomy, structure and functions to all flowering plants.
- Apply the embryological techniques and methods to various plant species and situations.



- Understand and apply the knowledge of pollen biology and methods and techniques to various plant species.

### **M.Sc. Botany I Semester –I**

#### **Course outcomes of DSC I Cell and Molecular Biology**

Upon completion of this course successfully, students would be able to

- Create monographs of algal isolates.
- Classify and identify algal genus
- Demonstrate the application of algae in different fields
- Create monographs of fungal isolates
- Classify and identify algal genus.
- Perform Diagnosis of plant diseases
- Create compendium of plant diseases

### **M.Sc. Botany I Semester –I**

#### **Course outcomes of BOEC I Medicinal Plant Diversity**

Upon completion of this course successfully, students would be able to

- study the Ethnic tribes in ethnobotany
- study the significance and cultivation of medicinal plants
- be aware about IPR.
- know the organizations' working in these lines.
- Explain and elaborate the history, scope and significance of medicinal plants.
- Apply this knowledge in cultivation of medicinal plants that are rare and endangered.
- Use some of these plants practically in minor ailments.
- Know ex-situ and in-situ conservation of some rare medicinal plants.
- Know patenting and preservation of Traditional knowledge.

### **M.Sc. Botany I Semester –II**

#### **Course outcomes of DSC V Plant Physiology**

Upon completion of this course successfully, students would be able to

- Grasp concepts of proteins, enzymes, basic plant signaling mechanisms, sensory photobiology.
- deal with physiology of nutrient uptake, photosynthesis and nitrogen metabolism
- demonstrate a depth of knowledge of physiological processes together with a better understanding of interaction and regulation of growth, metabolism and development and influence of environment on plant and further will be able to communicate scientific ideas in both written and oral forms to diverse audiences.
- showcase knowledge of various signal transduction mechanisms in plants. The concept of second messengers, calcium signaling, kinases/phosphatases in plant signaling would be delineated to

enhance their grasping power for understanding of different signaling pathways operative in plants. Two component signaling concept would be introduced and extended to plant hormone signaling. Quorum sensing and its potential biotechnological applications should be clear to students after these classes.

- gain knowledge about various mechanisms such as channel or transport proteins involved in nutrient uptake in plants. Further the course will deal with various phytohormones and their role in physiology of growth and development. This course will introduce students to physiological advances in sensory photobiology

## **M.Sc. Botany I Semester –II**

### **Course outcomes of AEC II Modern Techniques**

Upon completion of this course successfully, students would be able to

- learn about the latest techniques used in plant sciences
- get training on the tools and techniques.
- know the principle and applications of these techniques.
- Become expert in laboratory preparation as well as chemical preparations of different concentrations.
- Apply electrophoresis techniques for biological sample analysis.
- Standardize the process and techniques on basis of knowledge.
- Analyze and interpret the results with accuracy.
- demonstrate the various chromatographic techniques.

## **M.Sc. Botany I Semester –II**

### **Course outcomes of DSC VI Evolution and Diversity of Bryophytes and Pteridophytes**

Upon completion of this course successfully, students would be able to

- understand evolutionary diversification of early land plants and morphology and reproduction in bryophytes, pteridophytes.
- know the Ecological and Economic Importance of bryophytes, pteridophytes.
- classify Bryophytes into various groups, study their importance
- classify Pteridophytes into various groups, study their importance and multiplication of important ferns
- know the applied aspects of Bryophytes and Pteridophytes.
- Classify Bryophytes into various groups, study their importance
- Classify Pteridophytes into various groups, study their importance and multiplication of important ferns
- Create awareness on the threats to biodiversity and sensitize towards the Biodiversity Conservation for sustainable development.

## **M.Sc. Botany I Semester –II**

## **Course outcomes of DSC VII Genetics and Plant Breeding**

Upon completion of this course successfully, students would be able to

- understand the concept of classical and modern genetics clearly.
- study the inheritance pattern.
- know the role of chromosomes in evolution and the factors leading to changes in them.
- study mutations and breeding and their significance in crop improvement.
- study the variation in populations.
- Differentiate the genetics changes and can justify the reasons.
- signify the maternal inheritance can be very well elaborated.
- Explain how mutations can lead to variation and lethality.
- apply their knowledge to the changes in population genetics.

## **M.Sc. Botany I Semester –II**

### **Course outcomes of DSC VIII Plant Biochemistry and Pharmacognosy**

Upon completion of this course successfully, students would be able to

- study the plant biochemistry and its various aspects.
- study the metabolism and regulation of bio molecules.
- understand the medicinal properties of plants and its constituents.
- study the evaluation and standardization methods of drugs
- Classify Carbohydrates, Lipids, fatty Acids and their importance
- learn about the techniques of crude drug preparations.
- expand knowledge domain in tune with Drug development.

## **M.Sc. Botany I Semester –II**

### **Course outcomes of BOEC I Floriculture and nursery Management**

Upon the satisfactory completion of class assignments and the classroom experiences provided in the course, the student would be able to:

- List and describe procedural steps necessary during floriculture crop production from propagation to marketing.
- Identify and define environmental factors that regulate growth and flowering of floriculture crops.
- Develop production schedules for floriculture crops.
- Grow several crops in the greenhouse through nursery management.
- Identify and name some floriculture crops and classify them as potted, cut and/or garden crops.
- Develop methodology for production of horticultural crops through seeds.
- learn management practices for wholesale container and field production nurseries.
- Understand Business development, management, site selection and financial aspects.

- Acquire knowledge of harvesting and processing of nursery plants.

## **B. Sc. Zoology**

### **Programme outcomes and specific programmes outcomes**

#### **POs:**

At the time of graduation, Students will be able to

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

#### **PSOs**

By the end of the programme, Students would be able to

1. Develop a deeper sense with respect to phylum Protozoa to Echinodermata relation to taxonomy, classification, body organization and general characteristics this strengthens students' capability in basic zoology.
2. grasp various the Systematic positions from Protozoa to Echinodermata their pathogenicity and its epidemiology.

3. describe unique characters and recognize life functions of Protozoa, Porifera, Coelenterate, Helminthes, Arthropoda, Annelida, Mollusca and Echinodermata. Improve ability and apply Knowledge of Nonchordates for its execution in Agriculture especially with the phylum Arthropoda.

4. Implement an extensive idea about economic and ecological significance of various non-chordates phylum's in human life.

### **B.Sc. Zoology I Semester –I & II**

#### **Course outcomes of Life and diversity of Animals (Non-chordate)**

##### **COs:**

Upon completion of this course successfully, students would be able to

- Develop a deeper sense with respect to phylum Protozoa to Echinodermata relation to taxonomy, classification, body organization and general characteristics this strengthens students' capability in basic zoology.
- grasp various the Systematic positions from Protozoa to Echinodermata their pathogenicity and its epidemiology.
- describe unique characters and recognize life functions of Protozoa, Porifera, Coelenterate, Helminthes, Arthropoda, Annelida, Mollusca and Echinodermata.
- Improve ability and apply Knowledge of Non-chordates for its execution in Agriculture especially with the phylum Arthropoda.
- Implement an extensive idea about economic and ecological significance of various non-chordates phylum's in human life.

### **B.Sc. Zoology I Semester – I & II**

#### **Course outcomes of Life and diversity of Animals (Chordate) and concept of Evolution**

##### **COs:**

Upon completion of this course successfully, students would be able to

1. know what the chordates are.
2. Learn about the different phylum of chordates.
3. confidently explain the general characters and classification of Protochordates upto class Mammalia.
4. understand the level of organization in chordate.
5. explain the origin and evolutionary relationship in different subphylums of chordates.
6. describe specific features of Protochordates upto class Mammalia.
7. recognize and differentiate life functions of Protochordates upto class Mammalia.

8. understand Migration in fishes and birds , parental care in Amphibians and Poisonous and non-poisonous snakes.

9. explain the adaptations in Birds and Mammals.

### **B.Sc. Zoology I Semester – I & II**

#### **Course outcomes of Snake Identification their Rescue & Snake Bite Management.**

##### **Course Outcome:**

Every student participating in the course will get to know about the different species of snakes in Vidarbha. The student can easily identify venomous and non-venomous snakes. It will be possible to differentiate between venomous and non-venomous snake bites. Participate in a rescue operation with volunteers from a snake rescue organization. Understand how to catch them. Students confidently told about the habitat of snakes, their role in nature and why it is important to save snakes. Visiting hospitals for people who have been bitten by snakes will help them to understand the difference between the bites of different venomous snakes. Awareness can be created by taking active part in future campaigns on the importance of snakes for the environment.

### **B.Sc. Zoology I Semester – I & II**

#### **Course outcomes of Basic Course in Ornithology**

##### **Course Outcome:**

The student who has taken admission in this course will get basic knowledge of bird species from all over the world as well as complete information about bird species found in Maharashtra and Vidarbha. Course students will get an in-depth knowledge of various bird species in nature, their functions, their major habitats, bird-specific habitat. Students may have the opportunity to work on various research projects run by international or national bird organizations. Students can set up their own bird tour company, organize small bird tours at famous bird sanctuaries in India, pursue their hobbies and earn money through the tour. Students can put up an exhibition of selected photographs of the birds they photograph while going birding each day. This will make people aware of the local bird diversity and at the same time help encourage other students who are interested in the field. Students can also earn money by selling selected photos displayed in the exhibition.

### **B.Sc. Zoology I Semester – I & II**

#### **Course outcomes of ENVIRONMENTAL ISSUES AND ITS AWARENESS.**

##### **Course outcomes:**

- Students will understand current environmental scenario with clearer concepts in mind.
- Students will have Ability to demonstrate understanding of the environmental processes and will possess knowledge of the changing climate.
- Students will have Ability to comprehend to structure and functions of ecosystem.

- Students will know how to identify and quantify the magnitude and intensity of Environmental pollution problems.
- Student will have Ability to demonstrate understanding Environmental Laws and policies in India.
- Student will appreciate the ecosystem responses to climate change and how environmental crisis will greatly impact both current and future generations of humans and all other species.

### **Course Outcomes**

#### **B. Sc. Zoology (Sem III - Sem VI)**

Students will able to

- Classify Non Chordates animals
- Learn the habitats of different animals
- Get knowledge of economical importance of some animals
- Have the knowledge of which animals become the source of food
- Have the knowledge of diseases and their prevention like malaria, amoebiasis,
- Get the knowledge of structure of cell and cell organelles
- Know the functions of different cell organelles
- Get the knowledge of development process ie embryonic process in Amphioxus, Frog and Chick
- Have the knowledge of stem cells and its significance
- Practices incubation of chick egg. It will helpful them in poultry for how to hatch eggs
- Classify Chordates animals
- Have the knowledge of economical importance of some animals
- Have the knowledge of which animals become the source of human food anatomy and physiology of Chordate animals
- Students understood the Mendelian Laws and Assortments of traits in plants and animals
- Have the knowledge of genetic diseases and how these are transmitted
- Get the knowledge of process of evolution
- Have the knowledge of vestige organs, homologous organs and analogous organs
- Have the knowledge of physiological process in chordates ie physiology of circulation, osmoregulation, muscle physiology, nerve physiology ,reproductive physiology and endocrinology
- Count WBCs, RBCs, Haemoglobin percentage , blood pressure in Human
- Practices micro technique , a very basic principle of research work
- Students understand blood groups and related diseases
- Students understood the different ecosystem i.e. water, forest, etc. and also got the knowledge of role played by different organisms in ecosystem

## **M. Sc. Zoology**

### **Programme outcomes and specific programmes outcomes**

#### **POs:**

The post graduate course of Zoology will provide theoretical as well as experimental knowledge as per the courses included under the syllabi by which build up creativity in students will lead towards thorough learning and development of ideas of research work and will become ready to face recent challenges.

Students can attain the employability skills through the experiences based on their practical knowledge.

After completion of MSc in Zoology successfully, the students would be able to:

1. demonstrate the significance of the topics of syllabi and evaluate its relevance. Think creatively for its gravity and develop ideas.
2. Interpret scientific ideas and its analysis. Create experiments independently and draw inferences by sharing it with others.
3. Derive information from various digital sources. Develop skills for scientific writing and present the data and analyse it scientifically.
4. Articulate scientific ideas lay down a hypothesis, design the pathway to develop research ideas.
5. Acquaint skills in handling the instruments and different techniques through the practicals and developing the scientific temperaments for research.
6. Develop competence through healthy atmosphere and a quality intercommunication with different groups.
7. Understand environmental and sustainability issues and its sensitivity and regional relevance.
8. get the facility of different training and internship programs through job-oriented curriculum
9. Utilize the sources confidently and independently and develop self-sustenance.

#### **PSOs:**

Upon completion of the programme successfully, students would be able to

1. Learn to Prepare the checklist and inventories through the identification of the fauna in local areas being Melghat Tiger Reserve and Pohra Forest are very nearer to survey.
2. Gain comprehensive knowledge about different animals and develop confidence to handle them during research work.
3. Interpret metabolic pathways, their correlation in concern with prokaryote and eukaryotes.



4. Compare genetic aspects, genetic traits, diseases and their specific causes.
5. Survey and analyse data of the various kinds of diseases in the locality.
6. Understand the various strategies and phenomena related to animal reproduction and their development.
7. Get acquainted with conservation strategies and environmental threats to reduce and save energy through Wildlife Week Celebration.
8. Compare the different developmental events during embryogenesis of different animals.

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of Animal Structure and Function (Non-Chordate)**

Upon completion of this course successfully, Students would be able to .....

- Find out the taxonomic characters of the different animals and apply for forming the zoological names of the animals in biosystematics.
- Classify invertebrates by using different methods and can develop different cladogram and phylogram
- Compare different systems in all phyla of nonchordates and compare it with evolutionary significance of it. They know about the transition occurred with time scale. They can explain digestive, respiratory, circulatory, excretory, reproductive and nervous system from Protozoa to Hemichordata.
- find out distinguished mechanism of the different system function and the change in their mode of function if any throughout the invertebrate series
- Identify various larval forms of invertebrates like of Porifera, coelenterate, helminthes, Annelida and Crustacea.

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of Animal Structure and Function (Chordata)**

After learning this course, students would be able to.....

- Describe different types of taxonomic characters and rules and operative principles of International Code of Zoological Nomenclature and designate zoological names.
- Distinguish the endoskeletal system of Protochordates and Chordates and replacement of the cartilaginous structure by bones.
- Study different systems throughout the vertebrate series as per their adaptations in different habitat and their successive modifications.
- Explain structure and functioning of sense organs of mammals.
- Learn migration avenues of Fishes and Birds, their types, benefits, routes, threats etc.

**M.Sc. Zoology I Semester – I & II**  
**Course outcomes of Gamete Biology**

After learning this course, students would be able to.....

- Study spermatogenesis and oogenesis in eukaryotes.
- Determine different events and their mechanisms during fertilization and its consequent changes.
- Learn assisted reproduction techniques to overcome infertility.
- Understand Ex vivo and In vivo gene therapy etc.
- Learn about contraception and methods.

**M.Sc. Zoology I Semester – I & II**  
**Course outcomes of Genes and Differentiation**

After learning this course, students would be able to.....

- Describe cell specification and differentiation in whole vertebrate series.
- Study different body axis formation in Drosophila, Amphibia and Chick etc.
- Learn about Human Aging and Senescence and factors affecting it.
- Describe Biology of sex determination.
- Study stem cells, their properties, types markers and disorders etc.

**M.Sc. Zoology I Semester – I & II**  
**Course outcomes of 1ZOO5 Lab I: Practical based on 1ZOO1 and 1ZOO2**  
**1ZOO6 Lab II: Practical based on 1ZOO3 and 1ZOO4**

**Cos:**

Upon completion of the course successfully, students would be able to CO Description

- CO1 Understand comprehensive anatomy of different systems of animals with available resources like C.D./chart/ models/ Video clippings/ PPT/ Preserved dissected specimens etc.
- CO2 Prepare permanent mountings of various material
- CO3 Collect photographs of the fauna of the local region or selected field
- CO4 Classify the specimen by the salient features they carry
- CO5 Compare the bones throughout the vertebrate series

**M.Sc. Zoology I Semester – I & II**  
**Course outcomes of Cos of 1ZOO6**

Upon completion of the course successfully, students would be able to

**COs**

- CO1 realize the importance of animal ethics in laboratories
- CO2 Compare the structural differences of the reproductive organs of male and female animals.
- CO3 Analyze the events of oogenesis and spermatogenesis through histological preparations

- CO4 Distinguish between the developmental/metamorphic events in the life cycle of frog, Chick and Lymnea.
- CO5 Count the sperms and analyse semen for fructose contents

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of 2ZOO5 Lab III: Practical based on 2ZOO1 and 2ZOO2**

#### **2ZOO6 Lab IV: Practical based on 2ZOO3 and 2ZOO4**

**Cos:**

Upon completion of the course successfully, students would be able to

**CO Description**

- CO1 separate and determine molecular weights of protein by gel electrophoresis.
- CO2 Prepare histochemical demonstration of lysosomes by acid phosphatase activity
- CO3 Prepare histochemical demonstration of DNA by Fuelgen technique and DNA/RNA by MGPY Technique
- CO4 Prepare histochemical demonstration of carbohydrate by PAS reaction
- CO5 Separate Amino acid by Paper chromatography.
- CO6 Investigate bacterial growth and different microbial preparations

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of 2ZOO6: Practicals based on 2ZOO3 and 2ZOO4**

**Cos:**

Upon completion of the course successfully, students would be able to

**CO Description**

- CO1 study human hormonal disorders.
- CO2 Analyse parameters of different soil samples
- CO3 Analyse parameters of different water samples
- CO4 Calculate Diversity indices (Shannon, Simpson)
- CO5 Determine RQ
- CO6 Identify Freshwater Plankton from water samples
- CO7 Perform Qualitative analysis of Pollution indicators

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of COs 2ZOO1: Molecular Cell Biology**

After learning this course, students would be able to.....

- Understand and Compare Biomembranes and extracellular matrix.
- Compare various type cell surface and intracellular receptors.

- Analyse types of Cell Signalling pathways and Cell cycle control.
- Describe cytoskeleton in the form of microfilaments and microtubules.
- Determine secretory pathways in eukaryotic cells

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of COs 2ZOO2: Tools and Techniques in Biology**

After learning this course, students would be able to.....

- Apply principles and uses of techniques in Biology.
- Find principles and applications of advanced microscopes and compare their uses.
- Adopt different microbiological techniques.
- Know cryotechniques and cryopreservation of cells, tissues and organisms.
- Study Radioisotope and mass isotope techniques in biology.

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of CO's 2ZOO3 Endocrinology**

Upon completion of the course successfully, students would be able to

- Study histology and histophysiology of different endocrine glands.
- Study classification of hormones and their actions at cellular as well as genetic level.
- Study regulation of the processes in organism by hormones.
- Describe synthesis, transport and metabolism of steroid and nonsteroid hormones.
- Study hormones of different endocrine glands and relative diseases.
- Study hormone replacement therapy and neuroendocrine mechanisms in different animal.

### **M.Sc. Zoology I Semester – I & II**

#### **Course outcomes of COs 2ZOO4: Environment and Ecology:**

Upon completion of the course successfully, students would be able to

- Study environment and their biotic and abiotic interactions.
- Describe population ecology in terms of diversity indices along with growth curves, demes and dispersal.
- Study community ecology, ecological succession, ecosystems.
- Describe environmental pollution and effects on nature, global warming global dimming.
- Study conservation biology through sanctuaries, National parks, Project Tiger and Biosphere reserves.
- Study toxicological effects of pesticides and remedial aspects of it.
- Study Inter-Government Policy/Protocol for Climate change, Intellectual Property Rights and Environment Impact Assessment Processes.

### **M.Sc. Zoology I Semester – I & II**

**Course outcomes of 2ZOO5 Lab III: Practical based on 2ZOO1 and 2ZOO2**  
**2ZOO6 Lab IV: Practical based on 2ZOO3 and 2ZOO4**

**Cos:**

Upon completion of the course successfully, students would be able to

**CO Description**

- CO1 separate and determine molecular weights of protein by gel electrophoresis.
- CO2 Prepare histochemical demonstration of lysosomes by acid phosphatase activity
- CO3 Prepare histochemical demonstration of DNA by Fuelgen technique and DNA/RNA by MGPY Technique
- CO4 Prepare histochemical demonstration of carbohydrate by PAS reaction
- CO5 Separate Amino acid by Paper chromatography.
- CO6 Investigate bacterial growth and different microbial preparations

**M.Sc. Zoology I Semester – I & II**

**Course outcomes of 2ZOO6: Practicals based on 2ZOO3 and 2ZOO4**

**Cos:**

Upon completion of the course successfully, students would be able to

**CO Description**

- CO1 study human hormonal disorders.
- CO2 Analyse parameters of different soil samples
- CO3 Analyse parameters of different water samples
- CO4 Calculate Diversity indices (Shannon, Simpson)
- CO5 Determine RQ
- CO6 Identify Freshwater Plankton from water samples
- CO7 Perform Qualitative analysis of Pollution indicators

**B. Sc. Computer Science**

**Programme outcomes and specific programmes outcomes**

**POs:**

After completion of graduation, students will be competent to:

PO1: Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2: Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3: Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4: Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5: Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6: Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7: Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

### **PSOs:**

At the end of this program, the students would be able to:

PSO1: Understand the computer hardware and software.

PSO2: use the knowledge of software installation.

PSO3: Select modern computing tools and techniques for programming task.

PSO4: Identify, analyze, formulate and develop computer-based solutions to meet desired needs within realistic constraints.

PSO5: Develop databases and perform operations on them.

PSO6: Identify research and development areas in multiple disciplines.

PSO7: Design and develop the small web applications.

## **B. Sc. Computer Science Semester – I**

### **Course outcomes of Fundamentals of Computer and C Programming**

#### **COs**

Upon completion of this course successfully, Students would be able to -

- Understand the computer, I/O and peripheral devices.
- Understand concept of Operating systems.

- Apply the Programming concepts.
- Learn C language.
- Write Simple C Programs
- To draw flowchart, learn Algorithms and write simple programs.
- To assess the curricular skills acquired by students at college level through Assignments, Unit test, Internal Test, Group Discussion/Seminar/Mini Project, Study Tour

## **B. Sc. Computer Science Semester – I**

### **Course outcomes of Fundamentals of Computer and C Programming**

#### **COs**

Upon completion of this course successfully, Students would be able to demonstrate/perform/accomplish the following

- Write word processing task.
- Create worksheet and perform operations on it.
- Design, compile and debug programs in C language.
- Classify conditional expressions and looping statement to solve problems associated with conditions and repetitions.
- Demonstrate the programs using arithmetic and relational operators.
- Implement the concept of various string handling functions.
- Classify programming components that efficiently solve computing problems in real-world.

## **B. Sc. Computer Science Semester – I**

### **Course outcomes of 1CS2 Data Structure and OOPS**

#### **COs**

Upon completion of this course successfully, Students would be able to -

- Implement basic data structures such as arrays, stacks.
- use linked list, trees and queues.
- Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.
- Describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data and objects.
- Perform programming on functions, inline functions, constructor and destructor.
- Perform programming on the concept of function overloading, operator overloading, virtual functions and polymorphism.
- Acquire skill to work with core components of data structure
- Acquire object oriented programming skill.

## **B. Sc. I Computer Science Semester – I**

## **Course outcomes of Data Structure and OOPs lab**

### **COs**

Upon completion of this course successfully, Students would be able to demonstrate/perform/accomplish the following

- Perform various operations Data structure using CPP.
- Develop the concept of dynamic memory allocation through linked list.
- Design stack and queue with contiguous and non-contiguous data storage mechanism.
- Perform the various operations on binary tree.
- Implement sorting on 1-D array using different techniques

## **B. Sc. I Computer Science Semester – II**

### **Course outcomes of Data Structure and OOPs lab**

#### **COs**

Upon completion of this course successfully, Students would be able to -

- Implement basic data structures such as arrays, stacks.
- use linked list, trees and queues.
- Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.
- Describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data and objects.
- Perform programming on functions, inline functions, constructor and destructor.
- Perform programming on the concept of function overloading, operator overloading, virtual functions and polymorphism.

\*SEM : Assignment, Class test, Study tour, Industrial visit, Group discussion or any other innovative practice/activity

COs:

1. Acquire skill to work with core components of data structure
2. Acquire object oriented programming skill.

## **B. Sc. I Computer Science Semester – II**

### **Course outcomes of Data Structure and OOPs lab**

#### **COs**

Upon completion of this course successfully, Students would be able to demonstrate/perform/accomplish the following

- Perform various operations Data structure using CPP.
- Develop the concept of dynamic memory allocation through linked list.
- Design stack and queue with contiguous and non-contiguous data storage mechanism.
- Perform the various operations on binary tree.
- Implement sorting on 1-D array using different techniques



## **Course Outcomes**

### **B. Sc. Computer Science (Sem III- Sem VI)**

Students will able to

- Classify the computers, block diagram of computer, memory, keyboard, mouse, scanner, printers, DMP, inkjet, laser
- Have the knowledge about DOS, Booting process, formatting, directory structure, FAT
- Have the knowledge about internal DOS commands, REN, CD, MD, RD, DIR, DEL, COPY, TYPE, DATE, TIME, COPYCON, PROMPT
- Have the knowledge about external DOS commands , FORMAT, XCOPY, CHKDSK, PATH, ATTRIB, AUTOEXEC, BAT, CONFIG, SYS
- Have the introductory knowledge about windows, Windows explorer
- Have the knowledge about Number System, Decimal, binary, octal, hexadecimal and their conversions, ASCII code
- Know about internet, types of internet protocol such as, TCP/IP, FTP, HTTP, E-mail address, www web browser; Netscape navigator, search engine
- Understanding the programming concept like Algorithm, flowcharting programming languages, programme design
- Know the introduction to C, History, feature structure of C programme
- Have the knowledge about I/O operations, Print(),Scanf(), getche(),Control structure if, else, nested if, etc
- Have the knowledge about an introduction to Data structure, list array, stack and Queue
- Understanding the linked list and its implementation,
- Know Tree: Binary, tree traversing: inorder, preorder, postorder sorting and searching technique
- Understanding Function , prototype, local and global variable, function parameter, function with array
- Know the string handling , declaring and initialization of string variable, operating on string
- Know the structure, initialization of string of structure, nested structure
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students
- Understanding the fundamental of DAMS, database model, data dictionary
- Know the E-R diagrams function dependency, 1NF, 2NF, 3NF, 4NF, BCNF
- Have the knowledge about the introduction to SQL, data types, DDL commands, CREATE, ALTER, DROP, DML commands SELECTS, INSEART, DELETE
- Know the introduction to Visual programming, VB environment, New project window, toolbar, menu bar, tool box, form window
- Know the application wizard for menu, menu editor, text box, image control

- Know the introduction to internal functions; MsgBox(), default button, specifying icons, Input box, title, caption, VB programming
- Have the knowledge about numerical functions, data type function, special functions, string functions
- Know the number functions, AVG, MAX, MIN, SUM, COUNT, GREATEST, LEAST, ABS, MOD, FLOOR, CEIL, TRUNC, SIN, COS, LOG
- Know the character function; INITCAP, LOWER, UPPER, INSTR,
- Have the knowledge about the cursors, fetching data, transaction
- Know the securities of database, Dialog box control, mouse and control, working with form collection, the count properties,
- Have a knowledge about working with files; open statement, working with sequential access file, print# statement, file related commands

## **M. Sc. Computer Science**

### **Programme outcomes and specific programmes outcomes**

#### **PROGRAMME OUTCOMES (POs)**

Upon completion of the programme successfully, students would be able to

#### **PO1: Problem Analysis**

Identify, formulate, review research literature and analyze complex engineering problems in Computer Science and Engineering reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

#### **PO2: Design / Development of Solutions**

Design solutions for complex engineering problems and design system components or processes of Computer Science and Engineering that meet the specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

#### **PO3: Conduct Investigations of Complex Problems**

Use research-based knowledge and research methods including design of experiments in Computer Science and Engineering, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

#### **PO4: Modern tool usage**

Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex activities related to Computer Science with an understanding of the limitations.

#### **PO5: The services to the society**

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in Computer Science and Engineering.

### **PO6: Project Management**

Demonstrate knowledge and understanding of the computer science 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.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

Upon completion of the programme successfully, students would be able to

PSO 1: deliver efficient solutions for emerging challenges in the computation domain through continuous learning

PSO 2 : design, develop, implement computer programs and use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Computer System Design**

#### **Course Outcome:**

Upon completion of this course successfully, students would be able to

- Understand the theory and architecture of central processing unit.
- Analyze some of the design issues in terms of speed, technology, cost, performance
- Design a simple CPU with applying the theory concepts.
- Use appropriate tools to design verify and test the CPU architecture.
- Understand the theory of memory system design
- Understand the architecture and functionality of central processing unit.
- Exemplify in a better way the I/O and memory organization.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Data Structure with OOP**

#### **Course Outcomes**

Upon completion of this course successfully, students would be able to

- Learn the concepts of linear data structures such as arrays, linked lists, stacks and queues.
- Learn the concepts of non-linear data structures such as trees & Graph.
- Learn and understand various data searching and sorting methods with its complexity.

- Demonstrate operations such as insertion, deletion, searching and traversing on data structures.
- analyse and apply specific sorting and searching methods depending upon factors like type of data, volume of data.
- Learn & Understand B-tree indexing, hashing, collisions processing and its applications.
- Learn the fundamental concepts of data structures.
- Identify and Apply the fundamental concepts of data structures
- Apply Academic Skills & Critical Thinking Skills

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Data Base Management Technologies**

#### **Course Outcomes :**

Course Outcomes: On completion of this course, students would be able to:

- CO1: Analyze Database Management System & its Architecture and design ER model.
- CO2: Implement database queries using database languages and normalize the database design using normal forms.
- CO3: Write queries and PL/SQL Code blocks for given requirements, using different SQL and PL/SQL concepts.
- CO4: Apply different query processing, optimizing, indexing and hashing techniques in real-time database.
- CO5: Apply Transaction Management concepts, concurrency control concepts and deadlock handling concepts in real-time situations
- CO6: Use advanced database Programming concepts like Parallel databases, Distributed database & Object-based database for processing data

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Computer Network & Wireless Communications**

#### **Course Outcomes :**

Upon completion of this course successfully, students would be able to

- Apply cellular concepts to evaluate the signal reception performance in a cellular network and traffic analysis to design cellular network with given quality of service constraints.
- Determine the type and appropriate model of wireless fading channel based on the system parameters and the property of the wireless medium.
- Analyse and design receiver and transmitter diversity techniques.
- Determine the appropriate transceiver design of multi-antenna systems and evaluate the data rate performance.
- Design wireless communication systems with key 3G (e.g., CDMA) and 4G (OFDM) technologies.
- Describe and differentiate four generations of wireless standard for cellular networks.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Advanced Java**

#### **Course Outcomes :**

#### **1. Advanced Java:**

Upon completion of this course successfully, students would be able to

- become familiar with the advanced features of Java Language
- Design a desktop application which can be used for many kinds of clients.
- Gain the knowledge of J2EE architecture, MVC Architecture.
- Design a web application which can work as a dynamic web with the help of JDBC.
- Develop an application which can also be connected with the database.
- To understand Java Servlets and their life cycle
- To understand Java server Pages (JSP) technology
- To develop JSP Custom tags and use them in JSP pages

#### **2. NS-2 Tool:**

Upon completion of this course successfully, students would be able to

- demonstrate operation of network
- simulate and demonstrate the performance of GSM and CDMA
- implement data link layer and transport layer protocols.
- Demonstrate Installation procedure of the required software in groups and document the same in the journal.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Discrete Mathematical Structure**

#### **Course Outcomes**

Upon completion of this course successfully, students would be able to

- discuss fundamental concepts and tools in discrete mathematics
- Understand sets and perform operations and algebra on sets. Determine properties of relations, identify equivalence and partial order relations, sketch relations. Identify functions and determine their properties.
- assess the curricular skills acquired by students at college level through Assignments, Unit test, Internal Test, Group Discussion/Seminar/Mini Project, Study Tour
- Discuss fundamental concepts and tools in discrete mathematics with emphasis on their applications to computer science.
- Use mathematically correct terminology and notation.
- Construct correct direct and indirect proofs.

Apply logical reasoning to solve a variety of problems

### **M. Sc. Computer Science Semester – I & II**

#### **Course outcomes of Course Name Entrepreneurship Development**

##### **Course Outcome:**

Upon completion of this course successfully, students would be able to

- understand the Key concepts underpinning entrepreneurship and its application
- analyse the recognition and popularization of product/ service/ process opportunities.
- apply new ideas, methods and ways of thinking
- create new business plan and marketing it.
- investigate the issues associated with securing and managing financial resources in new and established organisations.
- design creative strategies for pursuing, exploiting and further developing new opportunities.

### **M. Sc. Computer Science Semester – I & II**

#### **Course outcomes of Name Research Methodology**

Outcomes Upon completion of this course successfully, students would be able to

- 1.draw upon foundational knowledge, learn, adapt and successfully apply analytical and computational approaches on changing societal and technological challenges
- 2. Demonstrate the ability to choose methods appropriate to research aims and objectives.
- 3. Understand the limitations of particular research methods. The curricular skills acquired by students should be assessed at college/university department level through Assignments,Unit test, Internal Test, Group Discussion/Seminar/Mini Project, Study Tour

### **M. Sc. Computer Science Semester – I & II**

#### **Course outcomes of Course Name Management Information System**

##### **Course Outcomes :**

Upon completion of this course successfully, students would be able to

- Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
- Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
- Effectively communicate strategic alternatives to facilitate decision making. Evaluate the role of information systems in today's competitive business environment.

- Assess the relationship between the digital firm, electronic commerce, electronic business and internet technology.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name Data Science and Analytics**

Upon completion of this course successfully, students would be able to

#### **Course Outcomes**

- Analyze and interpret data using an ethically responsible approach
- Use appropriate models of analysis, assess the quality of input, derive insight from results, and investigate potential issues
- Apply computing theory, languages, and algorithms, as well as mathematical and statistical models, and the principles of optimization to appropriately formulate and use data analyses
- Formulate and use appropriate models of data analysis to solve hidden solutions to business-related challenges
- Interpret data findings effectively to any audience, orally, visually, and in written formats

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name Lab-I 1,2 - Programming(C/C++/Java/ALP)**

#### **Course Outcomes:**

Upon completion of this course successfully, students would be able to

- Demonstrate the use of various OOPs concepts with the help of programs.
- Describe the procedural and object oriented paradigm with concepts of classes, functions, data and objects.
- Demonstrate the programs for the implementation of constructors, destructors and function overloading.
- Use the syntax and semantics of java programming language.
- Design event driven GUI and web related applications which mimic the real word scenarios.
- Get Familiarized with the assembly level programming.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name Lab-II 3-SQL/ DBMS tools, MS-SQL, My Sql**

#### **Course Outcomes :**

Upon completion of this course successfully, students would be able to

- Demonstrate the Basics Concepts and SQL Queries of Database Management System.
- Apply the Conceptual Design Model and Database Hierarchical Structure to construct the real-world requirement.
- Analyze the various constraints to populate the database through SQL Queries.

- Implement different working concepts of DBMS using SQL Queries.
- Present the result of database creation and querying process, document it.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course 1 Operating System Algorithms**

#### **Course Outcome:**

Upon completion of this course successfully, students would be able to

- Analyze basic components of Operating Systems and various types of Operating Systems.
- understand and implement the mechanism of an OS to handle multiple processes and threads and their communication.
- analyze different mechanisms involved in memory management OS.
- find the loopholes in the system to resolve the problem of deadlock.
- study the components and management aspects of concurrency management
- study and analyze the problems in distributed Operating System.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name - Graphics Application programming**

#### **Course Outcomes :**

Upon completion of this course successfully, students would be able to

1. Learn the fundamental concepts of Computer Graphics.
2. Identify and Apply the fundamental concepts of Computer Graphics in Animation, Virtual Reality.
3. Apply Academic Skills & Critical Thinking Skills
4. understand the mathematical modelling of graphical objects to be drawn/used in different kind of applications.
5. Learn and understand the concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in 2D & 3D.
6. Learn and understand the algorithms to generate line segments, polygon and its transformations, windowing and clipping.
7. Demonstrate operations such as various Transformation and Projection.
8. Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
9. Implement display control, 3D geometry, primitives and conversions, algorithms for hidden surfaces and lines, concepts of shading and curves.



**M. Sc. Computer Science Semester – I & II**  
**Course outcomes of Course Name 3 Software Engineering**

**Course Outcomes :**

Upon completion of this course successfully, students would be able to

- identify the need for engineering approach to software development and various processes of requirements analysis for software engineering problems.
- Analyse various software engineering models and apply methods for design and development of software projects.
- Work with various techniques, metrics and strategies for Testing software projects.
- Identify and apply the principles, processes and main knowledge areas for Software Project Management
- Proficiently apply standards, CASE tools and techniques for engineering software Projects

**M. Sc. Computer Science Semester – I & II**  
**Course outcomes of Course Name 4 Data Mining and Data Warehousing**

**Course Outcomes :**

Upon completion of this course successfully, students would be able to

- use basic concepts and techniques of Data Mining
- develop skills of using recent data mining software for solving practical problems.
- gain experience of doing independent study and research.
- study the methodology of engineering legacy databases for data warehousing and data mining to derive business rules for decision support systems.
- Develop and apply critical thinking, problem-solving, and decision- making skills.

**M. Sc. Computer Science Semester – I & II**  
**Course outcomes of Course Name 1-Operating system (Windows/Android/Linux)**

**Course Outcomes**

**1. Operating system Algorithm:**

Upon completion of this course successfully, students would be able to

- implement the mechanism of an OS to handle multiple processes and threads and their communication.
- simulate and demonstrate the performance mechanisms involved in memory management OS.
- demonstrate the loopholes in the system to resolve the problem of deadlock.
- simulate and demonstrate the performance the components and management aspects of concurrency management

- simulate and demonstrate the performance of the problems in distributed Operating Systems.

## **2. Java:**

Upon completion of this course successfully, students would be able to

- become familiar with the advanced features of Java 37 Language
- Design a desktop application which can be used for many kinds of clients.
- Gain the knowledge of J2EE architecture, MVC Architecture.
- Design a web application which can work as a dynamic web with the help of JDBC.
- Develop an application which can also be connected with the database.
- apply Java Servlets and their life cycle
- use Java server Pages (JSP) technology
- develop JSP Custom tags and use them in JSP pages

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name (1)Theory of Computation**

#### **Course Outcomes :**

Upon completion of this course successfully, students would be able to

- use basic concepts of formal languages of finite automata techniques
- Design Finite Automata's for different Regular Expressions and Languages
- Construct context free grammar for various languages
- solve various problems of applying normal form techniques, push down automata and Turing Machines

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name 2 Computer System Architecture**

#### **Course Outcomes Course Outcome:**

Upon completion of this course successfully, students would be able to

- Understand the theory and architecture of central processing unit.
- Analyze some of the design issues in terms of speed, technology, cost,performance.
- Design a simple CPU with applying the theory concepts.
- Use appropriate tools to design verify and test the CPU architecture.
- apply the concepts of parallel processing, pipelining and interprocessor communication.
- Understand the architecture and functionality of central processing unit.
- Exemplify in a better way the I/O and memory organization.
- Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.

## **M. Sc. Computer Science Semester – I & II**

## **Course outcomes of Course Name (3)Enterprise Resource Management**

### **Course Outcomes (COs)**

Upon completion of this course successfully, students would be able to

- build an understanding of the fundamental concepts of ERP systems, their architecture, and working of different modules in ERP.
- develop and design the modules used in ERP systems, and can customize the existing modules of ERP systems.
- Analyze the strategic options for ERP identification and adoption.
- Design the ERP implementation strategies.
- Apply reengineered business processes for successful ERP implementation.
- Implement ERP system with different approaches.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name (4)Mobile Computing**

#### **Course Outcome :**

Upon completion of this course successfully, students would be able to

- Explain the basics of mobile Computing
- Describe the functionality of Mobile IP and Transport Layer
- Classify different types of mobile telecommunication systems
- Demonstrate the Adhoc networks concepts and its routing protocols
- Make use of mobile operating systems in developing mobile applications

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name (5) Compiler Construction**

#### **Course Outcomes**

Upon completion of this course successfully, students would be able to

- explore the principles, algorithms, and data structures involved in the design and construction of compilers.
- write the machine dependent code
- draw the flow graph for the intermediate codes.
- Design a compiler for a simple programming language

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name Lab-III 3,4-SE-Tools/DM Tools**

#### **Course Outcomes**

Upon completion of this course successfully, students would be able to

- Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship.
- Draw a class diagram after identifying classes and association among them.
- Graphically represent various UML diagrams and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially.
- use modern engineering tools for specification, design, implementation and testing
- translate end-user requirements into system and software requirements
- generate a high-level design of the system from the software requirements.
- Provide a formal basis for understanding the modeling language.
- apply standard data mining methods and techniques such as association rules, data clustering and classification.
- Learn new, advanced techniques for emerging applications (e.g. social network analysis, stream data mining).
- Gain practical intuition about how to apply these techniques on datasets of realistic sizes using modern data analysis frameworks.

## **M. Sc. Computer Science Semester – I & II**

### **Course outcomes of Course Name Lab-IV 2 Graphic Programming & Tools**

#### **Course Outcomes**

Upon completion of this course successfully, students would be able to

- Apply the basic concepts of C programming in developing the code for various Graphics applications.
- Individually Apply C programming concepts to do the Programming for Computer Graphics.
- Identify and apply a suitable transformation for a given application.

#### **Course Outcomes (M. Sc. Computer Science)**

##### **Semester-III and IV**

Students will be able to

- Study the data mining and data warehousing, data processing, data warehouse and OLAP technology, mining frequent patterns, associations and correlations
- Know the classification and prediction, cluster analysis, graph mining social network, analysis of multirelational data mining
- Understanding the computer graphics, geometry and line generation, polygon, segments, interaction
- Know the hidden surfaces and lines, shading and curves
- Understanding the Client-Server computing, networking in Java, Java data base connectivity, servlets

- Understanding the Java script overview, Remote method invocation RMI, JSP concept and advanced JSP
- Know the distributed DBMS , synchronization in distributed system, process and processors in distributed system, distributed file system and case study MACH
- Understanding the artificial intelligence and expert system, prolog programming, AI technique, basic problem solving methods, game planning
- Have a knowledge representation using predicate logic, natural language understanding and its concept
- Study the design and analysis of algorithms, Greedy method, basic search and traversal technique, branch and bound, general method, 0/1 knapsack problem
- Understanding the lower bound theory
- NP-Hard and NP-complete problem
- Study the network security, Cryptography, Authentication, Standard, E-mail security, Firewall
- Have the knowledge about mobile communication, medium access control, satellite systems, wireless LAN, Layers, support for mobility

## **B. Sc. Environmental Studies**

### **Programme outcomes and specific programmes outcomes**

- Environmental Science is an multidisciplinary course to develop an awareness of the natural , social and cultural environment
- Environmental science emphasis on using various objects, places, plants and animals
- Students exposes to real situations in their surroundings to help them to connect
- Undergraduates students demonstrate critical thinking skills in relation to environmental affairs
- Students expresses knowledge and application of communication skills and the ability to write effectively in a variety of contexts
- Undergraduate students acquire awareness about the ability to integrate the many disciplines and fields that intersect with environmental concern
- Students the approach to environmental issues with a focus on sustainability
- Students develop skills of reflection, critical analysis and communication
- Enhance and promote curiosity and creativity in relation to the immediate surroundings

### **Course Outcomes**

#### **B. A. / B. Com. / B. Sc. Environmental Studies (Sem VI)**

Students will able to

- Understand the multidisciplinary nature of environmental studies , definition, scope and importance , need for public awareness

- Know the social issues and the environment from unsustainable to sustainable development
- Understand urban problems related to energy, water conservation, rain water harvesting
- Have the knowledge about the environmental ethics, global warming, consumerism and waste products
- Know the environmental protection act, wildlife protection act, forest conservation act and public awareness
- Understand the human population environment, population growth, environment and human health, case study
- Acquire the knowledge about human rights, value education, woman and child welfare
- Understand the role of information technology in environment and human health

## **Bachelor of Commerce & Management**

### **Programme Objectives :-**

- To impart the basic knowledge of Economics.
- To impart basic knowledge of Accountancy & Statistics.
- To impart knowledge of creating a cash book and ledger books.
- To impart the basic knowledge of management, planning, organizing, directing and controlling
- To impart the basic knowledge of application of computers and its development.
- To impart the knowledge of business sectors, firms, e-commerce, cashless transaction
- To impart the knowledge of local and global enterprises and trade.
- To develop presentation skills and ability of goal setting.
- To bring about the holistic development of the students.
- To develop ethics of life.
- To inculcate Environmental awareness.
- To impart the fundamental knowledge of Computer.

### **Programme Outcomes :-**

- The students would be able to –
- Attain requisite skills and knowledge after the completion of the Programme.
- Achieve the basic knowledge of Economics.
- Assimilate basic knowledge of Accountancy & Statistics.
- Efficiency in reading and writing skill.
- Achieve requisite skills and knowledge of preparing cashbook, ledger books and balance sheet of company.
- Become knowledgeable about marketing.
- Create a self employment.

- Assimilate ethics of life.
- Achieve Environmental awareness.
- Attain fundamental knowledge of Computer.

### **B.COM I. Semester – I**

#### **Course outcomes of English.**

##### **Course Outcome :**

1. Able to communicate skillfully in Business correspondence
2. Acquaint with the work culture in corporate world
3. The life of great personalities will motivate them to toil to be successful
4. Learn and gain fluency in the English language and conversation.
5. Become efficient in reading and writing skills.
6. The drafting skills of the learners will be honed through grammar and writing skills
7. Become proficient in the language and to eventually inculcate professional skills

### **B.COM I. Semester – I**

#### **Course outcomes of Principle of Accountancy**

##### **Course Outcome :**

- Student important basic accounting knowledge at applicable to business i.e. meaning of
- accountancy.
- Able to handling account transaction
- Maintaining sub subsidiary books and all types of cash books
- Calculation of depreciation method of assets
- Preparation of all types of final account.

### **B.COM I. Semester – I**

#### **Course outcomes of Principle of Business Economics**

##### **Course Outcomes :**

- Application of Micro & Macroeconomic Concepts
- Application of Utility & Indifference Curve Analysis
- Application of Demand Pattern
- Application of Supply and Production Pattern
- Application of Cost & Revenue Pattern.

### **B.COM I. Semester – I**

#### **Course outcomes of Principle of Business Management**

##### **Course Outcomes :**

The students will be able to :

- With this course, students will be able to have clear understanding of managerial functions.
- Students will have the knowledge of planning process in the organization.
- Students will be able to demonstrate the ability to directing, leadership and communicate effectively.
- Students able to analyze isolate issues and formulate best control tools and techniques.

## **B.COM I. Semester – I**

### **Course outcomes of Computer Fundamental And Operating System-I**

#### **Course Outcomes:**

The students will be able to -

- Get information about evolution and application of computer & its development.
- Know about different elements of computer system.
- Aware about different types of memory.
- Get to know about different input devices and output devices.
- Learn to prepare a text document with complete formatting and page setting.

## **B.COM I. Semester – I**

### **Course outcomes of Computer Fundamental And Operating System-I (Practical)**

#### **Course Outcomes:**

Students will be able to do at the end of practical's:

- Prepare new document using Templates.
- Change font size & font color
- Change line spacing of Paragraph
- Change case of Paragraph
- Create Bullets, Numbering list
- Create Subscript & Superscript
- Decrease and Increase of Paragraph indent
- Insert Header & Footer in document
- Page Setup of Document
- 10) Insert Page break, Section break, Columns.
- Students will learn to final Proofing and printing documents.

## **B.COM I. Semester – II**

### **Course outcomes of English.**

1. Able to communicate skillfully in Business correspondence



2. Acquaint with the work culture in corporate world
3. The life of great personalities will motivate them to toil to be successful
4. Learn and gain fluency in the English language and conversation.
5. Become efficient in reading and writing skills.
6. The drafting skills of the learners will be honed through grammar and writing skills
7. Become proficient in the language and to eventually inculcate professional skills.

## **B.COM I. Semester – II**

### **Course outcomes of Course Outcomes of Skill Enhancement Module :**

The students will be able to:

1. Acquaint with work culture in Bank
  2. Acquaint with the use of ICT in Finance sector
  3. Acquaint with Management Skills in the industry
- i) Assignment: A Report on Visit to Bank or Industry
  - ii) Class Test: Sharing experiences on visited Bank or Industry

## **B.COM I. Semester – II**

### **Course outcomes of Financial Accounting**

**Course outcome :**

- 1 Rectification of Journal entry
- 2 Student acquire the knowledge of nonprofit organization
- 3 Prepare the all types of cooperative society account
- 4 Students should be acquired partnership farm accountancy
- 5 The bill of exchange contest and unconditional order to pay a create amount on as agree day.

## **B.COM I. Semester – II**

### **Course outcomes of Business Economics**

**Course Outcomes**

- Examine the difference between business and managerial economics.
- Application of Discriminative nature of monopolist.
- Application of monopolistic competition, oligopoly, and perfect competition
- Application of demand and supply pattern of rent and wage.
- Application of the theories of interest and profit.

## **B.COM I. Semester – II**

### **Course outcomes of Principle of Business Organization**

The students will be able to:

- To Familiar with business organization.
- Understand the concepts related to Business policies.
- Demonstrate the roles, skills and functions of management.

- To diagnose and solve organizational problems and develop optimal managerial decisions..

## **B.COM I. Semester – II**

### **Course outcomes of Computer Fundamental And Operating System-II (Practical)**

#### **Course Outcome:**

Students will be able to do at the end of practical's:

- Know how to organize files/folder in File Explorer
- Understand different customization setting in windows 10.
- Create windows login Account which is necessary for Windows 10
- Create table, utilizing existing Template provided by Microsoft and add customization Template according to user needs.
- Add header and footer to long list of pages which is crucial.
- Complete Mail Merge process.
- Change layout of pages
- Create Presentation, designing slides and add different Transition and Animation effect to objects and Slide.

#### **Course outcomes**

### **B. Com. (Sem-III – Sem-VI)**

Students will able to

- Know the different definitions of economics, Micro and macro economics
- Know the utility approach, demands and its expectations
- Have the knowledge about the elasticity of demands, concept, measurements, determinants and importance, indifference curve and its characteristics
- Understand the production function, ISO quants, internal economics and diseconomies
- Know the meaning and types of cost, short and long run curve, total, average and marginal revenue curve
- Have a basic knowledge of operating system, structure, types, concept, MS DOS, MS WINDOW NT, UNIX, LINUX
- Have the knowledge about Window 7 , Window screen, internal explorer, task bar, properties
- Know the advanced operating system, its programmes and features, functions of operating system, data management, security
- Understand the modern communication concept, FAX, Voice mail, e-mail, tele communication, video conferencing, network type LAN, MAN, WAN
- Have a knowledge about the word processing working with table and graphics, procedure and application of mail merge
- Understanding the working with MS power point 2007, its concept, different slides view, gallery, colour layout, slide show and printing

- Have a basic accounting knowledge applicable to business
- Know the classification of accounts, rules of debit and credit, posting and balancing
- Understanding the rectification entries and suspense accounting
- Know the sub-sidiary book, purchases book, cash book, sales book, trading account, profit and loss balance sheet with adjustment
- Understand the depreciation concept, problems on straight line method and reducing balanced method
- Understand the bank reconciliation statement
- Understand the business and managerial economics, meaning, characteristics, nature and scope, objectives and importance
- Know the market structure ; meaning classification, price determination and price discrimination under monopoly
- Understanding the monopolistic competitions, oligopoly, and price determination under monopoly
- Know the factor pricing, marginal productivity theory, Wages, Rent, interest, profit, and its innovation theory,
- Understanding the Loanable funds and liquidity preference theory of interest
- Know the Management concept, planning Organizing directing and controlling
- Understanding the Cost Accounting, Cost Concepts, Classification of Cost, Material Cost, Labour Cost, Reconciliation of Cost and Financial Accounts
- Understanding Indian Business Environment, Agricultural Environment, Industrial Environment, Service Environment, India and Foreign Trade Environment
- Indian Contract Act,12, Sales of Goods Act, 1930 and Consumer Protection Act, 19, Negotiable Instrument Act, 11, Goods and Services Tax Act, CGST, SGST and IGST
- Business Process, Industrial Policy, Public sector, Compensation Act - Industries Development and Regulation Act, Export- Import Policy
- Cooperative Movement, Cooperative Movement in India, Cooperative Management, Administrative System for Cooperatives, Issues in Co-operative Management
- Horizon of Insurance Industry, Life Insurance
- Understand the concept, features, objectives functions and importance of Public Sector Banks, Private Banks, Cooperative Banks, Development Banks, Non-Banking Financial Institutions
- Have the knowledge about Network, Types of Networks, Network Model, Internet, Internet Enabled Services, The mechanism of the internet, Open System Interconnection Reference Model

- Have the knowledge about Electronic Mail, The World Wide Web Consortium, Website, Designing Website/ Webpage, HTML, Explanation of Structure of the home page
- Understanding the basics of e-commerce, e-commerce in India, Retail e-commerce, B2B e-commerce, e- Payment and e- Banking
- Understanding the Management Accounting, Break-Even-Analysis, Problems on Break Even Analysis, Ratio Analysis, Budget, Budgetary Control
- Know the Economic Development, Economic Growth Models, Growth Balanced & Unbalanced, Development of Capital: Human & Financial
- Understanding the silent features of company, Act 2013, Formation of company, stages of formation, Promoters, Functions of promoter, Duties and liabilities of promoter
- Know the incorporation of company, Share capital of company, securities market, company secretary and company meetings
- Understand the business Policy, Levels of Management, Corporate Planning, Strategy Formulation, International business environment
- Have the knowledge about Indian Economy, Primary, secondary and tertiary Sector Co-operatives, Cooperative Development Agencies
- Understanding the Insurance corporations, Insurance Regulations and Acts, Career in Insurance-Agent, Insurance Marketing, Current Scenario of Insurance Industry
- Understanding the Retail Banking, Deposits: A Banking Shake hand, Advances: Ultimate Banking Purpose, Agency Functions: Trusteeship, Online Banking: Modern Incarnation
- Study the Web Browsing, History of web Browsers, Web Directory, Mobile Applications, Google Drive, M.S. FrontPage Express
- Study the Internet e-commerce Business Models, B2C Internet Marketing, B2B Online Marketing, E-governance, E- Governance Models

**Master of Commerce (Sem-I – Sem-IV)**  
**Programme Objectives & Programme outcomes**

**Programme Objectives :**

- 1) To enable the student to acquire the process of managerial economics, demand analysis, production theory, price determination and pricing practices, etc.
- 2) To acquaint the student with basic issues in services marketing and customer relationship management.
- 3) To enable the student to understand & master the accounting concepts as well as tools and techniques used for taking managerial decisions.
- 4) To impart the knowledge of ratio analysis, cash flow and budgetary control.
- 5) To enhance decision making abilities of students in situation of uncertainty in dynamic business environment.

- 6) To help the student to understand and master the conceptual framework of Management and organizational behavior.
- 7) To provide understanding of computer operating system and application of relevant software's in managerial decision making.
- 8) To impart the knowledge of commercial banks and its transactions, nature and scope of insurance and its kinds.

### **Programme Outcomes :-**

The student would be able

- 1) To acquire a job as an Economist, Market Research Analyst, a banker, management consultant, stockbroker/trader, Actuary, Financial analyst, Financial advisors or Advisor to Tax Law Court etc.
- 2) To acquire the process of managerial economics, demand analysis, production theory, price determination and pricing practices, etc.
- 3) To acquire proficiency in the accounting concepts as well as tools and techniques used for taking managerial decisions.
- 4) To master the knowledge of ratio analysis, cash flow and budgetary control.
- 5) To achieve decision making abilities in the situation of uncertainty in dynamic business environment.
- 6) To master the conceptual framework of Management and organizational behavior.
- 7) To attain understanding of computer operating system and application of relevant softwares in managerial decision making.
- 8) To gain the knowledge of commercial banks and its transactions, nature and scope of insurance and its kinds.

## **M.COM I. Semester – I**

### **Course outcomes of Managerial Economics**

#### **Course Outcomes**

- Application of concepts of Managerial Economics in the process of business decision making.
- Application of demand supply concepts towards consumer choices.
- Compare economies and dis-economies scale of production in real life situation.
- Assessment of Production process determination in various industries.
- Impact of business cycles in Agriculture, Industry, Services and Share Market.
- Application of pricing practices in various markets and bargaining tendencies thereof.

## **M.COM I. Semester – I**

### **Course outcomes of Service Marketing & Customer Relationship Management**

#### **Course Outcome**

- Students will understand seven phases of marketing of service in depth.
- Student will understand strategic issues peculiar of service marketing.

- Students will understand an importance of new and innovative concepts of CRM, especially E-CRM.
- Demonstrate idea creation and implementation of CRM for different service sector.

### **M.COM I. Semester – I**

#### **Course outcomes of Advanced Financial & Cost Accounting**

##### **Course Outcomes :**

- Investments are assets held by an enterprise for earning income Final Accounts gives an idea about the profitability and financial posting of business to its management, owners and other interested parties.
- The cost sheet is prepared to ascertain cost of product/job/operation or to give autatier or to determine tender price for supply of goods or providing service
- Operating result the operating result is the surplus or deficit for the year under the Accounting Standard
- framework an getting result recognize all revenues and operating expenditure
- Accounting for construction contracts is the allocator of contract revenue and contract.

### **M.COM I. Semester – I**

#### **Course outcomes of Banking & Insurance Services**

##### **Course Outcomes :**

- Application of CIBIL Score in qualifying the proposal of advances.
- Impact of Monetary Policy on various industries.
- Impact of PMJJBY & PMSBY.
- Assessment of Claim Settlement Procedure of Life Insurance.
- Assessment of Claim Settlement Procedure of General Insurance.

### **M.COM I. Semester – II**

#### **Course outcomes of Accounting for Managerial Decision**

##### **Course Outcomes :**

- Ratio analysis compares line item data from a company's financial statements to reveal regarding profitability individually operated ... and solvency.
- A cash flow analysis determines a company working capital the amount of money available to run business operation and complete transaction. That is Calculate as current assets and current liabilities.
- The outcome of Anovit in the statistics This ratio shows the difference between the with in group variance and which ultimately produces a figure which allows a conclusion that the hypothesis is supported or rejected.

- BEO tells you how many units of a product must be sold to cover the fixed and variable cost of production. The BEP is considered to measure the margin of
- Budgetary control is the process of preparation of budgets for various activities and company the budget figures for arriving at deviation of any which to be elemental in future. Thus budget is a means and budgetary control is the end result.

## **M.COM I. Semester – II**

### **Course outcomes of Strategic Management**

#### **Course outcome**

- Demonstrate decision making ability and dynamism.
- Will understand major theories, background work, concept and research output in the field of strategies management.
- Demonstrate a proper meaning of the tools and technique used by executives in executing strategies and will appreciate its integrative and interdisciplinary nature.
- Demonstrate practical situation for diagnosing and solving organizational issues.
- Relate theories and device application of it.

## **M.COM I. Semester – II**

### **Course outcomes of Management Concept & Organizational Behavior**

#### **Course Outcomes :**

- Student Understand decision making process both at individual level and in group.
- Student Understand Power, Politics, and Accomplishing organizational goals.
- Students demonstrate ability to manage conflicts.
- Students will determine Leadership style according to the situation.

## **M.COM I. Semester – II**

### **Course outcomes of Computer Application in Business**

#### **(Skill Enhancement Course)**

#### **Course outcomes:**

- Word processing allows students to interpret and process to understand higher standard of word processing. Students can perform the practical parts and remove mistakes on word documents.
- Students should be able to demonstrate and understanding of accounting theory. Apply accounting procedure by using computer accounting software. Perform accounting reports and records.
- Enable students to gain expert knowledge, principles and procedure of computerize accounting and taxation. Critical thinking and problem solving skills in analyzing financial information and taxation.

- Student should know basic data types in spreadsheets. Is able to determine database and convert them. Know basic functions to calculate mathematical, statistical and logical operations. Have skills of data visualizing depending on data and task types.
- Understand how to start MS –Excel and SPSS. Enter basic data into SPSS and Carry out statistical analysis that can test hypothesis. Develop various required graphs.

## **M.COM I. Semester – II**

### **Course outcomes of Computer Application in Business (Practical) Skill Enhancement Course**

#### **Course outcomes:**

- Upon completion of the practical course student will be able to1. Describe what micro soft word 2013 and how it is useful in both personal and professional life.
- Create a new document, work with a document, format text insert and work with clip arts and pictures, use the mail merge, print a documents and create high quality document designs and layouts.
- Enter the accounting transactions in computerized format and gate the financial results.
- Acquire the skill of financial decision making and interpret the financial statements as well as evaluation of stock of the end.
- Apply the micro soft office Excel program and modify a worksheet. Work with cell references.
- Learn to use functions and formulas. Create and edit tables, charts and graphs. Import and export data .

#### **Course outcomes**

### **M. Com. ( Sem-III – Sem-IV)**

Students will able to

- Know the concept of managerial economics, opportunity cost principle, equi marginal principle
- Understand the demand analysis in individual and market, law of demand, price elasticity, income elasticity, cost elasticity, theory of consumer choice
- Have a knowledge about the production theory, production with one and two variable inputs, economics and dis-economics of scale, law of supply
- Understanding the price determination and pricing practices, characteristics of different market structures, monopolistic competition, oligopoly and monopoly
- Know the business cycle, monetary innovation, samuelson and Hicks theories, characteristics and types of inflation, effects of inflation
- Know the nature and types of services, services marketing triangle, micro and macro environment for services marketing, customer's expectations and perception
- Understand the service marketing process and applications



- Know the customer relationship management, nature and scope, attributes and determinants of relational exchange
- Know the customer selection, relationship strategies, and implementing customer relationship management
- Know the accounting books and final accounts, accounting standard, valuation of goodwill and shares
- Understanding the final accounts and financial statements of companies, amalgamation and absorption of companies
- Have a knowledge about cost accounting, meaning, importance and scope of cost accounting, costing as guide to business policy, typical problems on ascertainment of total cost, net profit and selling price
- Have the knowledge about the allocation of on-cost, special revenue items, operating costing
- Understanding the normal spoilage or wastage, abnormal spoilage, job and contract accounting, cost audit, procedure, advantage of cost audit
- Have a knowledge about the commercial banks, functions, credit creation, nationalisation, mobilisation of resources, current trends in giving loans, NPA, computerisation of banks, E-banking, ATM

Understanding the functions of RBI, SBI and co-operative banks, role of economic development of the country, functions of regional, rural and co-operative banks

- Know the nature and scope of insurance, progress and performance, privatisation of insurance and its effect
- Have the knowledge about life, fire, marine, crop, livestock insurance, other forms of insurance like, motor, personal, accident, sickness
- Know the legislation of life and general insurance, development, working and functions of IRDA, IDBI, IFCI, ICICI, IBRD
- Know the concepts of environment and components of environment, SWOT analysis
- Have the knowledge about modernization and diversification, disinvestments and liquidation, marketing, production, personal financial policies
- Understanding the conceptual framework of management and organizational behaviour
- Providing knowledge and understanding the application of relevant softwares in business data analysis for accounting and decision making
- Making students conversant with the basic principles and theoretic concepts of the research methodology and guide them in their application so that students will be able to write project report
- Make the student learn the application of statistical tools and technique for decision making

- Making students conversant with the corporate assessment, concept of corporate tax planning and Indian tax laws, as also their implications for corporate management
- Gain knowledge about E-commerce and its various components with legal security
- Understanding to the field work and practical proficiency that should be acquired by the students
- Understanding the structure organization and working of financial market and institution in India
- Understanding the various issues in security analysis and portfolio management
- Acquaint student with the theory and practice and advertising as well as management of a firm sales operation
- Have the knowledge about co-operation and management, human resource management, financial management, Marketing management, co-operation legislation
- Expose students to the conceptual framework of International marketing management
- Have the knowledge about International marketing, International business and economic environment
- Know the foreign policy, procedures and documentation

### **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

#### **PSOs:**

After completion of this course students will be able to:

1. Comprehend various forms of literature like Prose, Poetry, Drama and Fiction
2. Develop the knowledge of grammatical system
3. Develop four language skills LSRW
4. Widen scope of employability and Entrepreneurship viz Teaching, Civil Services and Creative Writing.

#### **B.A.I. Semester – I**

#### **Course outcomes of Compulsory English**

Cos:-

After completion of this course students will be able to:

- Understand the basic knowledge of English language and literature
- Understand the relation between literature and real life.

- Understand and interpret the prose, poem, short stories
- Write the News Report, Letter, Essay, Paragraph etc.
- Avail the pleasure of literary forms such as Novel, Poem, Play etc.
- Develop interview technique, Reading Skills, Writing Skills and Speaking Skills.
- Enhance the interest in English Language.

### **B.A.I. Semester – I**

#### **Course outcomes of Skill Enhancement Module (For Internal Assessment)**

##### **Reading Skills: Comprehension**

###### **Cos:**

After completion of this module students will be able to:

- Read speedily and fluently.
- Develop understanding of the passage
- Enrich their vocabulary.
- Summaries a paragraph.

### **B.A.I. Semester – I**

#### **Course outcomes of Ability Enhancement Course (Communication Skills in English)**

###### **COs :**

After completion of this course students will be able to:

- Communicate effectively in different real life situations.
- Register complaints, make enquiries and give opinions.
- Make proper self introduction.
- Respond well to questions at an interview.

### **B.A.I. Semester – II**

#### **Course outcomes of Compulsory English**

###### **PSOs:**

After completion of this course students will be able to:

1. Comprehend various forms of literature like Prose, Poetry, Drama and Fiction
2. Develop the knowledge of grammatical system
3. Develop four language skills LSRW
4. Widen scope of employability and Entrepreneurship via Teaching, Civil Services and

Creative Writing

### **B.A.I. Semester – II**

#### **Course outcomes of Cos:-**

After completion of this course students will be able to:

- Understand the basic knowledge of English language and literature
- Understand the relation between literature and real life.
- Understand and interpret the prose, poem, short stories
- Write the News Report, Letter, Essay, Paragraph etc.
- Avail the pleasure of literary forms such as Novel, Poem, Play etc.
- Develop interview technique, Reading Skills, Writing Skills and Speaking Skills.
- Enhance the interest in English Language.

### **B.A.I. Semester – II**

#### **Course outcomes of Skill Enhancement Module (For Internal Assessment)**

##### **Writing Skills: Writing an Application**

**Cos:**

After completion of this module students will be able to:

- Understand various types of application.
- Understand the structure of application.
- Write various applications.

#### **Course outcomes**

### **B. A. (Sem-III – Sem-VI) – English**

Students will be able to

- Understand the basic knowledge of English language and literature
- Writing the news report, letter, essay, paragraph etc
- Avail the pleasure of literacy forms such as, novel, poem, play etc
- Develop interview technique
- Understanding and interpret the prose, poem short stories
- Enhancing the interest in English language
- Have the relation between literature and real life

### **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

#### **Programme : B.A. (English Literature) Part A**

**PSOs:**

AFTER COMPLETION OF THIS COURSE STUDENTS WILL BE ABLE TO:

1. Understand Literary Movements that existed in different ages.
2. Define Literary Theories and Terms in Criticism.
3. Develop reading, writing and analytical skills.
4. Communicate their ideas critically and creatively.

### **Programme : B.A. (English Literature) Semester-I to VI**

#### **Cos:**

AFTER COMPLETION OF THIS COURSE STUDENTS WILL BE ABLE TO:

1. Analyse various forms of literature.
2. Acquaint them with the forms of structures and aesthetics of style and techniques of literary works.
3. Analyse various elements of literature.
4. Communicate in English orally and in writing.
5. Kindle their critical thinking skills.

### **Programme : B.A. (English Literature) Semester I&II**

#### **Skill Enhancement Module (For Internal Assessment) Report Writing**

#### **COs:**

After completion of this module students will be able to:

1. Understand different kinds of Reports.
  2. Understand writing reports effectively
  3. Prepare effective reports
- I) Project : Collection of Newspaper Report
- II) Class Test : Report of Activity

### **Programme : B.A. (English Literature) (Soft Skills) Semester I&II (Course Code GIC ENG 1.5)**

#### **COs:**

AFTER COMPLETION OF THIS COURSE STUDENTS WILL BE ABLE TO:

1. Understand various soft skills.
2. Avail the pleasure of reading English short stories.
3. Use soft skills in day to day life.
4. Communicate in English orally and in writing.

**Programme : B.A. (English Literature) (Soft Skills) Semester I&II  
(Course Code GIC ENG 1.6)**

**COs:**

**AFTER COMPLETION OF THIS COURSE STUDENTS WILL BE ABLE TO:**

1. Understand various soft skills.
2. Avail the pleasure of reading English short stories.
3. Use soft skills in day to day life.
4. Communicate in English orally and in writing.

**Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)  
Programme : B.A. (Marathi)**

**B.A. Marathi (Required) Syllabus Specific Result PSOS:**

- 1) Sant Gadgebaba B.A from Faculty of Human Sciences, Amravati University. By studying the Marathi (required) syllabus, the concept of 'literature' will be clarified and the Marathi language taste will be developed.
- 2) Marathi literary tradition, writers, poets, thinkers will be introduced, social integration, interfaith equality, national integration and human values which are the foundation of Indian Constitution will be inculcated in the students through their writings.
- 3) Students will develop interest in Marathi, language, literature, art, due to the development of their vision of treatment, comparison and review, they will conduct proper study, research and creative production of writing in various literature types.
- 4) By studying language and literature at the social as well as artistic level, practical application of literature and language can be made by developing prudent rationality and compassionate sensitivity.
- 5) Arts students will acquire linguistic skills to get prestigious employment along with philosophical study of Marathi language.
- 6) Students will apply practical skills required in various fields through Marathi language.

7) Students will develop an attitude towards various skill formation required for employment generation.

## **B.A.I. Semester – I**

### **Course outcomes of compulsory Marathi**

#### **Conclusion of Study (COS):**

1. From the assigned literature, the life philosophy, contemporary business sense will be known.
- 2 Knowledge of various types of literature such as conceptual, fine, poetry. In this class one will know the uniqueness of the Maya type and will understand the similarities and differences between them.
3. Students will understand the creative form of language through conceptual prose. Also, students will get inspiration from the life work of great people with character and the idea that they can overcome the crisis and succeed in life will make them money.
4. Through the reading of fine art, the students' knowledge about life will be enriched by getting pleasure, understanding, knowledge etc
5. The perspective of the students will be enriched by conceptualism, philosophy, poetics, sentimentality, vision of abnormality in ordinary things,
6. Students will develop their taste by increasing their ability to understand, describe, appreciate, analyze and evaluate different types of literature.
7. Through this literary form, the students will get the teaching of various moral values, life values, it will be used to lead a better life.
8. Through the applied component, various types of skills will be developed in them and they will become employable
9. Students will understand how to use language creatively and produce different types of literature through this study will be motivating and helpful to become thinkers, writers, poets. Also they will be employable by practical application.

## **B.A.I. Semester – I**

### **Course outcomes of Ability Enhancement Course-I**

#### **Conclusions of Study (COs)**

1. It will help in the development of communication skills.

2. It will help to increase Marathi language ability.
3. The doors to the conversation area will open
4. Opportunities will be available in various business sectors.

### **B.A.I. Semester – I**

#### **Course outcomes of compulsory Marathi 'Shabdganha' part-1**

##### **Coordinating Officers (COs):**

1. From the assigned literature, life philosophy, contemporary practice awareness will be known.
2. There will be knowledge of various forms of conceptual, fine, poetry. The uniqueness of this type of palace will be known and the similarities and differences between them will be understood.
3. Through ideological prose, students will understand the creative form of language, also the life work of great people with character will inspire students and the idea that success in life can be overcome by overcoming adversity will be instilled in them.
4. Through the reading of fine art, the students' knowledge about life will be enriched by attaining happiness, wisdom, knowledge etc.
5. The perspective of the students will be enriched with conceptualism, philosophy, poetics, sentimentality, vision of abnormality in ordinary things.
6. Students will develop their taste by increasing their ability to understand, describe, appreciate, analyze and evaluate different types of literature.
7. Students will learn various moral values and life values from this class, which will be used to lead a good life.
8. Through the applied component, various types of skills will be developed in them and they will become employable.
9. This study will be motivating and helpful to become a thinker, writer, poet, students will understand how to use language creatively and will produce different types of literature and will become employable by practical application.

### **B.A.I. Semester – II**

#### **Course outcomes of 'Marathi Language Skills: Writing Skills'**

##### **Conclusions of Study (COs)**



1. It will help in writing skill development.
2. It will help to increase Marathi language ability,
3. The doors to the writing field will open.
4. Opportunities will be available in various business sectors.

### **Course outcomes**

#### **B. A. (Sem-III – Sem-VI) – Marathi**

Students will able to

- Explaining the nature of language and literature
- Obtained the skills of literary criticism
- Obtaining the skills of writing essay, letter, news report, one act play, poetry
- Enhancing the interest in Marathi language
- Understanding the various trends in rural literature
- Developing reading, writing, speaking and listening skills

#### **B.A.I. Semester – I to VI**

##### **Course outcomes of Marathi Literature**

1) By studying the Marathi literature (optional) curriculum in the Faculty of Humanities of Sant Gadgebaba Amravati University, the concept of literature will be clarified and the taste of Marathi language will be developed.

2) Marathi literary tradition, writers, poets, thinkers will be introduced, social integration, interfaith equality, national integration and human values which are the foundation of Indian Constitution will be inculcated in the students through their writings.

3) Students will develop interest in literature and art. As his vision for therapy, comparison, and review develops, he will study, research, and creatively produce writing in various literary genres.

4) The study of language and literature at the social as well as the artistic level leads to the practical application of literature by developing rational rationality and compassionate sensitivity.

5) Literature students will acquire skills to get prestigious employment with study of Marathi literature.

6) Students will develop an attitude towards various skill building required for employment generation.

#### **B.A.I. Semester – I**

## **Course outcomes of Marathi Literature (Optional)**

### **Course Outcomes (COs):**

- 1) Awareness of social issues and social values will be created through the flow of novels.
- 2) The novel Dhulpaval will show various characters in the society and rural culture.
- 3) The complexities of relationship and emotional movement of the characters in the assigned novel can be explored
- 4) Linguistic and literary values will be studied.
- 5) The technique of novel writing can be learned.
- 6) By understanding the nature and elements of a novel, one can attempt to write a novel based on human beings and other elements that are at the center of life.
- 7) Various types of compositions can be studied through poetry.
- 8) Commitment to social consciousness, national unity, love feelings, sentimentality will arise.
- 9) Various streams of poetry will be introduced and the inspiration for poetry will be developed from it.

## **B.A.I. Semester – II**

### **Course outcomes of Marathi Literature (Optional)**

#### **Course Specific Outcome (PSOS):**

- 1) By studying the Marathi literature (optional) course in the Faculty of Humanities of Sant Gadgebaba Amravati University, the concept of literature will be clarified and the taste of Marathi language will be developed.
- 2) Marathi literary tradition, writers, poets, intellectuals will be introduced, social integration, interfaith equality, national integration and human values which are the foundation of Indian Constitution will be inculcated in the students through their writings.
- 3) Students will develop an interest in literature and art, develop the ability to treat, compare, and review it, and will conduct proper study, research and creative production of writing in various literary genres.
- 4) The study of language and literature at the social as well as the artistic level leads to the practical application of literature by developing rational rationality and compassionate sensitivity.

5) Literature students will acquire skills to get prestigious employment with study of Marathi literature

6) The attitude of various skill formation required for employment generation will be created in the students.

## **B.A.I. Semester – II**

### **Course outcomes of Marathi Literature (Elective)**

1) The students will be introduced to the literary form 'Nataak' which enriches human life

2) Various human tendencies will be seen in the play 'Vata Palawata'.

3) Social culture will be seen through Vata Palawata plays and various personalities will be introduced.

4) The study of 'Vata Palawata' will develop the ability to understand, appreciate and evaluate drama

5) Studying the elements and techniques of drama production will inspire students to produce drama.

6) This study paper will be useful for students who want to pursue a career in drama / theatre.

7) Various types of compositions can be studied through Kavyasarita.

8) Commitment to social consciousness, national unity, love feelings, sentimentality will arise.

9) Various streams of poetry will be introduced and inspiration for poetry will develop from it.

## **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

### **Programme : B.A. (Philosophy)**

#### **PSOs:**

1. To develop the insight among students about Fundamentals of Indian and Western

Philosophy

2. To create an interest among the students about various Indian and Western Schools.

3. To classify between Indian and Western Philosophical thoughts.

4. To inculcate and develop Ethical Values among the students

5. To apply the various Moral Values in day to day life.

6. To analyze the moral thoughts of Contemporary Indian Saints.

### **B.A.I. Semester – I**

#### **Course outcomes of Introduction to Philosophy**

##### **COs**

- To create insight about Nature of Philosophy.
- To develop understanding of Branches of Philosophy.
- To identify various isms in Philosophy.
- To develop insight into Orthodox and Heterodox Schools and Contemporary Indian Philosopher.
- To Evaluate Ancient, Medieval and Modern Western Philosophy and Contemporary Western Philosopher.
- To Analyze and Evaluate the contribution of various Contemporary Indian Social Philosopher
- To Criticize and Justify the Theories of various Contemporary Indian Social Philosopher

### **B.A.I. Semester – II**

#### **Course outcomes of Human Life and Ethics**

##### **COs**

- To introduce the Nature of Ethics as a branch of Philosophy.
- To develop understanding of various concepts in Human Moral System.
- To develop insight and application of Buddhist, Jainas', Patanjali's, Plato's and Kant's ethics in every human being for betterment of life.
- To Apply Moral Teaching of Indian Saints in day to day life.
- To know an ultimate goal of human life according to Hedonic thoughts various Indian and Western Moral Thinkers.
- To Analyze and Evaluate the Applied Ethics
- To Criticize and Justify the Significance of Applied Ethics.

#### **Course outcomes**

#### **B. A. (Sem-III – Sem-VI) – Philosophy**

Students will able to

- Know the definition of Philosophy, moral philosophy or ethics and the branches of Philosophy
- Understand the nature of ethics that is ethics is a science or not
- Do the Philosophical analysis of conduct, Greek Hedonism, Cyrenicism, Immanuel Kant
- Know the concept of purusharthaie Dharma, Artha, Kaam and Moksha, ethics of Geeta and Veda
- Have a knowledge about Buddhist ethics, Jaina's ethics, Hedonism, object of moral judgement, Justification for punishment

- Know the ancient Greek Philosophy, Monist philosopher, Pluralist philosopher
- Know the Sophist, Socrates, Aristotle and Plato and their thoughts
- Have the knowledge about the thoughts of Rene Descartes, Benedict Spinoza, G W Leibnitz, John Locke, George Berkeley, David Hume, G W F Hegel, Immanuel Kant, the concept of God

## **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

### **Programme : B.A. (B.A. Economics)**

#### **Pos:**

1. Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

#### **PSOs:**

- Problem analysis: recognize formulate and study the problems of various sectors of the Indian economy, regional economy and the global economy with the help of the economic ways of thinking, theories, concepts and laws.
- Apply the knowledge of economic concepts, laws and theories, for a better economic environment for the society at large.
- Communicate effectively on the economic activities with the community and the society through the acquiring knowledge of the national and the global economy.
- To build on these concepts to develop deeper understanding of Economy in the future.
- Explain the basic concepts, laws and theories related to the economic behavior of the human being.

- Graduates from our department are effectively taught and explained the cause with the help of visual aids like white board and PowerPoint Presentation.
- They will be able to visualize the real world situation and enhance them to initiate the programmers for pursuing studies and be alert with the importance of entrepreneurial skills for their self-employment, to improve the general attitudes and living conditions of the masses.

## **B.A.I. Semester – I**

### **Course outcomes of Economics Micro Economics**

#### **Course Outcomes:**

The student will be able to:

- Apply knowledge and skill in the field of Economics and will be able to have the employability in these areas.
- Describe and apply the methods for analysing consumer behaviour through demand and supply, elasticity.
- Perform analysis to analyse the impact of economic events on Markets,
- To create a new approach towards the study of Economics.
- The course will illustrate how microeconomic concepts can be applied to analyze real-life situations
- Analyse the performance of firms under different market structures,
- Evaluate the factors affecting firm behaviour, such as production and costs
- To have better awareness regarding different Factors Pricing Rent, Wages, Interest, and Profit.

#### **Skill Enhancement Module(SEM): Agricultural Market System**

- Awareness about Market System
- To develop the ability of Entrepreneurship

## **B.A.I. Semester – II**

### **Course outcomes of Economics Economy of Maharashtra**

#### **Course Outcomes:**

The student will be able to:

- Develop ideas of the basic characteristics of Maharashtra's economy and its potential for natural resources.
- Understand agriculture as the foundation of economic growth and development, analyse the progress and changing nature of the agricultural sector and its contribution to the economy as a whole.
- Understand the role of Agriculture in Economy of Maharashtra.
- Study the issue of farmers suicide in Maharashtra.

- Study the concept of FDI and its trends in Maharashtra.
- Consider the role of Industry and Service sector in Economy of Maharashtra.

#### **Skill Enhancement Module (SEM): Agro-based Industries**

- To introduce Agro-based Industries
- To understand how to create new employment opportunities from Agro-based Industries

#### **Course outcomes**

##### **B. A. (Sem-III – Sem-VI) – Economics**

Students will able to

- Know the different degrees of competitions in market affect pricing and output
- Understanding the efficiency and equity implications of market interference
- Study the characteristic features and changes in indian economy
- Have the knowledge about theories of economic growth, development and issues of economic problem
- Understanding the problem of unemployment, poverty, rising economic and social inequality and unbalancing problems of India
- Understanding the impact of new economic reforms and planning in indian economy
- Have the knowledge about GDP, GNP, NNP, personal income etc
- Identifying the basic concept and theories of macroeconomics and awareness about changing the economic policies
- Understanding the pricing in different market
- Evaluating the development of economic thoughts
- Have the knowledge about the changes in export import policies of India
- Knowing the various aspects the various aspects of research in economics
- Evaluating various types of exchange rates and its merits and demerits
- Realizing various production theories

#### **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

##### **Programme : B.A. (Political Science)**

#### **POs:**

- 1: Understanding of constitution, government institutions, electoral processes and policies.
- 2: Knowledge of some of the philosophical underpinnings of modern politics and government.

3: Develop the ability to make logical inferences about social and political issues on the basis of comparative and historical knowledge.

4: Knowledge of key theories and concepts, political thoughts, organization, and modern issues in international relations.

5: Develop the analytical abilities, observational skills and decision making abilities of the students so that they will be able to face different challenges of life.

6: Equip students with the concepts, principles, theories and processes studied in Political Science, so as to facilitate their career choices and employment.

7: Aim at shaping the students' perception and outlook on social, economic and political environment of India and beyond.

#### **PSOs:**

Student of B.A. program studying Political Science as an optional subject is expected to:

1: To understand the basic structure of Indian political system

2: To Inculcate interest in political field

3: To create the leadership qualities in students

4: To understand Indian governing system

### **B.A.I. Semester – I**

#### **Course outcomes of Political-Science Indian Political System**

#### **COs**

At the end of the course the students should be able to:

- 1: Understand and explain the significance of Indian constitution as the fundamental law of the land.
- 2: To know the making process of the constitution and salient features of Indian constitution.
- 3: Exercise the fundamental rights in proper sense at the same time identifies his responsibilities in national building.
- 4: Analyze the Indian Political System, the powers and functions of the Union, State Government in detail.
- 5: Critically analyzing the important institutions of Indian Union: The Executive: President, Vice-President, Prime Minister, Council of Ministers, State Executive: Governor, Chief Minister, Council of Ministers, The Legislature: Rajya Sabha, Lok Sabha, State Legislature, The Judiciary: Supreme Court and High Court: Composition and jurisdictions.
- 6: To make conscious of the social, cultural, economic and political environment that affects politics in India, at the national as well as regional levels.
- 7: To improve knowledge and communication and presentation skill of the students.



- 8: To encourage the students to explore new areas relevant to the topic.

## **B.A.I. Semester – II**

### **Course outcomes of Political Science Indian Political System**

#### **COs**

At the end of the course the students should be able to:

- Understand and explain the significance of Election Commission of India
- know the powers and role of Governor, Chief Minister & Council of Minister
- Understand structure & powers of Legislative Assembly and Legislative Council
- Explain the structure and jurisdiction of High Court and District Court
- Know the Composition Function and Powers of Grampanchayat & Gram Sabha.

#### **Course outcomes**

### **B. A. (Sem-III – Sem-VI) - Political Science**

Students will able to

- Have the knowledge about political systems of the nation and study the national and international political affairs
- Create the appropriate and efficient leaders
- Know the political processes, structure and the actual functioning of the political system
- Understand the concepts, ideas and theories in political science
- Understand the preamble- nature and importance
- Understand the fundamental rights, duties and know the methods to acquire citizenship
- Understand the election process, power and functions
- Understand the parliament, Lok Sabha and Rajyasabha, its structure and powers
- Know the directive principles of the state policy
- Know the role and functions of President, vice-president, Speaker of Lok Sabha and Prime Minister of India
- Have the knowledge about the structure of Indian Judiciary
- Understand the structure and powers of High court and Supreme court
- Understand the structure and powers of election commission of India, electoral reforms, recognition of political parties, eligibility of voters
- Understand the state executives like appointment, power, role and functions of Governor, Chief minister and Council of minister
- Study the parliament of UK, salient features of constitution of USA
- Understand the Legislature of USA congress
- Study the objectives, structure and function of South Asian Association for Regional Co-Operation (SAARC)

- Study the legislative assembly, Vidhansabha, VidhanParishad and legislative council
- Obtain the information of the political parties and system of justice in India
- Understand the local self government of Maharashtra in which students understand the types of local self Government (Urban & Rural), Municipal Corporation Gram Panchayat their structure, power, structure and functions
- Know the woman participation in panchayat raj in Maharashtra
- Study of salient features of the constitution of China
- Study the Composition, powers and functions of state council of China
- Understanding the appointment, role and functions of President and Prime minister of China,
- Study the aims and basic principles of UNO, general assembly, council of UNO, International court justice
- Understand the Indo-China relations- Major issue etc

### **Programme Outcomes and Programme specific outcomes Bachelor of Arts (B. A.)**

#### **Programme : B.A. (B.A. Home Economics)**

##### **PSOs**

After successfully completion of UG course in Home Economics student will be able to -

- Describe the home management process and apply it in practice for planning and executing inside and outside the home
- Play model role as a home maker, home manager, home Scientist, counselor as well as play a differentrole in different kinds.
- Build Confidence to create her own business and adjust in it better way.
- Derive certain changes in behavior and attitudes that require for effective communication and as a Entrepreneur.

#### **B.A.I. Semester – I**

#### **Course outcomes of Family Resource Management and Interior Decoration**

##### **COs**

After successfully completion of course student should be able to-

- Formulate a plan of activities/programs managing and saving resources.
- Evaluate the planned activities and will be able to build better plan in coming program.
- Classify the decisions to its hierarchy for achieving a goal in future.
- Make family budget with list of items.
- Make greeting cards and sample design using colour schemes
- Quote and Name to each flower arrangement.

**Objectives:** This course will enable the students-

- To recognize the basic concepts home economics.
- To design a plan of home-work using management process.
- To classify the resources and decisions and use it effectively.
- To enhance the chances of reaching the desired goals through wise decisions and effective use of resources.
- To apply the course knowledge in day-to-day life.

### **B.A.I. Semester – I**

#### **Course outcomes of SEM (Module) Event Management**

**Objectives: -**

- To Acquire the basic concept of event management
- To design a event plan for carrying out easily and skillfully.
- To enable event delivery and evaluation
- To develop skills Event /planning is a source of employment and self-employment

**COs**

After successfully completion of module course students should be able to –

- Design Draft of event plan and follow the timeline
- Do job work in event planning industry as well as play a role of Event manager after well-practiced
- Identify best practice in the development and delivery for successful event.
- Enhance the scope for bringing understandings into event planning practices.

### **B.A.I. Semester – I**

#### **Course outcomes of Family Resource Management and Interior Decoration**

**COs-**

After successfully completion of practical course student will be able to-

- Draw a design for colour schemes.
- Apply the practical knowledge of colour schemes for rangoli and flower arrangement.
- Do and demonstrate types of flower arrangements.
- Take order of flower decoration.

### **B.A.I. Semester – I**

#### **Course outcomes of Family Resource Management and Interior Decoration**

**Objectives:**

- To realize the basic concepts of housing
- To design a plan of different arrangements in home Decoration
- To modify the home simply using this course knowledge.

- To demonstrate the principles of housing
- To develop aesthetic sense of students.

#### **COs**

After successfully completion of course student can-

- Formulate a plan of arrangements to modify home decoration.
- Classify and arrange the items using principles of housing.
- Design plan of work/ activities by acquiring knowledge of Work Simplification
- Make carrier in the field Interior Decoration and designing.
- Apply and guide ergonomics' technique for comfort physique.

### **B.A.I. Semester – II Home Economics**

#### **Course outcomes of SEM (Module) Interior Decoration**

Objectives: This Module will enable the students-

- To describe the basic concept of Interior Decoration
- To design art draft skillfully.
- To inspire the students to choose their carrier in this field
- To apply the knowledge in their carrier advancement

#### **COs**

After successfully completion of module course student should be able to-

- Design a Draft plan of interior decoration on gain knowledge.
- Match all the arrangements in order to relation in home space and area.
- Enhanced their Skills in this field for carrier advancement.
- Open his/her self- enterprise all industry, applying the respective course knowledge.

### **B.A.I. Semester – II**

#### **Course outcomes of Family Resource Management and Interior Decoration**

#### **COs-**

After successfully completion of practical course student will be able to-

- Draw a design on clothes.
- Apply the practical knowledge for making block printing sample
- Create carpet designs applying motifs
- Decorate their own home by applying the practical course knowledge.
- Enter in this field doing self-enterprise.

#### **Course outcomes**

#### **B. A. ( Sem-III – Sem-VI) - Home Economics**

Students will able to

- Create an awareness among the students about resource and their management in the family
- Make aware about decision making and to enhance the decision making capability of the woman
- Provide knowledge and develop skills regarding principles and methods of interior decoration
- Develop skill regarding preparing the bouquets and flower arrangements for decoration and enhance the chances of employment
- Developing the food preparation skills in the students
- Enables people to understand people, business, and market
- Enables the development of skills and the achievement of meaningful learning
- Bring awareness about waste management and water conservation for environment protection
- Learn and apply the skill of earning while learning
- Develop knowledge, understanding, skill and attitudes necessary to meet nutritional recommendation and provide healthy diet
- Have the knowledge about cooking, sewing and finances
- Train students from self employment point of view
- Understand the development abilities to plan diets for various diseases
- Understand the methods of food preparation and food preservation
- Aware the work of different in the area of health

### **Programme Outcomes and Programme specific outcomes Master of Arts (M. A.)**

#### **Programme : M.A. (English)**

##### **PROGRAMME OUTCOME (POs)**

- 1) To educate students in English literary and critical writing with a view to enable them to probe literary & critical theories & contexts that require substantive expertise in literature.
- 2) To develop and foster ideological sense and a sense of social awareness and cultural understanding.
- 3) To acquire proficiency in expression skills and critical thinking skills through exposure to various forms & genre of writing.
- 4) To develop research, critical and analytical attitude & approach in the students.
- 5) To help emerge social thinkers & critics who can take up a study of various social problems and issues that ail the society and impede social change and progress and contribute to the process of social transformation and social progress.

6) To help grow great leaders, thinkers, artists, visionaries, pundits / experts, educationists, managers, consultants, guides, coaches, social analysts, reformers, social activists, social pleaders & crusaders, think-tanks, journalists, critical and creative writers professionally in various fields of knowledge.

### **COURSE OUTCOMES (COs)**

1) The students would acquire critical attitude and approach and gain knowledge, intellectual competence and critical scholarship which would help them to improve their performance in competitive exams like MPSC/UPSC/NET/SET in the subject.

2) The student will be able to understand and apply the evocative power of language and would be able to apply critical insight and judgment to form an informed and impactful opinion.

3) The Student will be fairly acquainted with the background and socio-political as well cultural background of the poets and understand the factors behind their making and evolution. The student will grasp the distinctive writing style and technique of various poets & creative writers.

4) The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.

5) The student will understand the socio-political and cultural importance of Literature and Literary Criticism.

6) The Course would help emerge social thinkers & critics who can take up various social problems and issues that ail the society and impede social change and progress and thus to achieve social transformation and social progress.

### **M.A. (English) I. Semester – I**

#### **Course outcomes of History of English Literature-1**

##### **Programme Specific Outcomes (PSOs-1) –**

1) To develop a sense of history through understanding of major traditions, trends, conventions, fashions as well as social developments.

2) To facilitate insight into social norms and culture that the causes and consequences of human actions and dispositions.

3) To study the emergence and development of Renaissance and its influence on the English society.

4) To assimilate the values and principles that lead to progress and social well-being.

##### **Course Outcome (Cos-1):**

1) To gain critical understanding and insight into the phenomenon of Renaissance

2) Understanding the factors behind the emergence of Shakespeare as a great dramatist

3) To critically analyse the chronology of events that led to the rise and glory of Elizabethan Literature

4) To improve one's performance in competitive exams like MPSC/UPSC/NET/SET

**M.A. (English) I. Semester – I**  
**Course outcomes of Literary Criticism – 1**

**Programme Specific Outcomes (PSOs- 2)**

- 1) To enhance aesthetic understanding
- 2) To develop critical, analytical and logical thinking and judgment
- 3) To grasp and assimilate critical temper and insight
- 4) To appreciate and analyse critical texts and documents
- 5) To apply logic and sense of discrimination in decision-making

**Course Outcome (Cos-2):**

- 1) To be able to write critical review
- 2) To analyse and interpret texts
- 3) To compare and contrast different ideas
- 4) To apply critical sense and judgment to form an informed opinion
- 5) Acquisition of critical attitude.

**M.A. (English) I. Semester – I**  
**Course outcomes of Poetry – 1**

**Programme Specific Outcomes (PSOs- 3)**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Poetry as an Art.
- 2) To develop fertile imaginativeness and emotional depth and maturity.
- 3) To perceive subtle nuances and shades of meaning in the use of language.
- 4) To appreciate and assimilate suggestive and pictorial quality of language.
- 5) To sharpen artistic and critical skills with better grasp and acquisition of qualities like Pictures queness, terseness, conciseness, accuracy, aptness, freshness etc. in expression.
- 6) To explore the subjective nature of Truth and Beauty.

**Course Outcomes (Cos-3)**

1. The Student will be able to critically appreciate and interpret a piece of poetic work.

2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the poet and understand the factors behind his making and evolution.
3. The student will grasp the distinctive poetic style and technique of various poets.
4. The student will understand the socio-political and cultural importance of Poetry and Poetic art.
5. The student will be able to quote the memorable quotations in his speech and writing.
6. The student will be able to understand and apply the evocative power of language.
7. The student will understand and appreciate the subjective nature of Truth and Beauty.
8. The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.

### **M.A. (English) I. Semester – I**

#### **Course outcomes of Drama – 1**

##### **Programme Specific Outcome (PSOs-4):**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Dramatic art.
- 2) To understand various dramatic types and the origin of the English drama.
- 3) To explore and appreciate the wonder and magic of Renaissance Drama and the greatness of Shakespearean dramatic art.
- 4) To understand and assimilate the laws and principles of dramatic composition.
- 5) To acquire insight and understanding of the mysteries and ironies of human life.

##### **Course Outcomes (Cos-4)**

1. The Student will be able critically appreciate a piece of dramatic art.
2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the dramatist and understand the factors behind his making.
3. The student will grasp the distinctive dramatic style and technique of various playwrights.
4. He will understand the socio-political and cultural significance of Play and dramatic art.
5. He will be able to quote the memorable dialogue and quotations in his speech and writing.

### **M.A. (English) I. Semester – I**

#### **Course outcomes of Fiction**

##### **Programme Specific Outcomes (PSOs- 5):**

- 1) To enhance artistic sensibility for word and critical understanding of Novel as an art form.



- 2) To understand cultural and social importance of Novel as a genre from various chronological ages of English literature.
- 3) To acquire comprehensive understanding of plot construction and art of characterisation.
- 4) To enhance emotional depth and maturity as well as existential understanding of life.
- 5) To understand and assimilate the laws and principles of fiction writing.
- 6) To acquire insight and understanding of the mysteries and ironies of human life.

#### **Course Outcomes (Cos -5)**

1. The Student will be able to critically appreciate and analyse a piece of fictional writing.
2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the novelist and understand the factors behind his making.
3. The student will grasp the distinctive writing style and technique of various novelists.
4. S/he will understand the socio-political and cultural importance of Novel writing.
5. S/he will be able to quote the memorable quotations in his speech and writing and acquire artistic expression skill.
6. S/he acquire insight and understanding of the mysteries and ironies of human life.

### **M.A. (English) I. Semester – II**

#### **Course outcomes of History of English Literature -2**

##### **Programme Specific Outcomes (PSOs- 6)**

- 1) To develop a sense of history through understanding of major traditions, trends, conventions, fashions as well as social developments.
- 2) To facilitate insight into human nature as well as understanding of social norms and culture.
- 3) That the causes and consequences of human actions and dispositions.
- 4) To study the emergence and development of Renaissance and its influence on the English society.
- 5) To assimilate the values and principles that lead to progress and social well-being.

##### **Course Outcome (Cos- 6):**

- 1) The student will attain a sense of history and the impulses behind human action.
- 2) To gain critical understanding and insight into trends & fashion in English society and culture.

- 3) Understanding the factors behind the emergence of John Milton as well as other post Shakespearean writers and value and significance of their literary output.
- 4) To critically analyse the chronology of events that led to the rise and growth of post Shakespearean writers.
- 5) To create good critical thinkers and writers.

### **M.A. (English) I. Semester – II**

#### **Course outcomes of Literary Criticism- 2**

##### **Programme Specific Outcomes (PSOs- 7)**

- 1) To enhance aesthetic understanding and expression skills.
- 2) To develop critical, analytical and logical thinking and judgment.
- 3) To grasp and assimilate critical temper and insight.
- 4) To appreciate and analyse critical texts and documents.
- 5) To apply logic, reasoning and sense of discrimination in decision-making.
- 6) To grow in erudition and intellectual scholarship.

##### **Course Outcome (Cos - 7):**

- 1) The student be able to write critical and scholarly reviews and articles.
- 2) The student analyse and interpret texts and grasp subtle and deep meaning embedded in the texts.
- 3) The student compare and contrast different ideas logically and rationally.
- 4) The student apply critical sense and judgment to form an informed opinion.
- 5) The student will acquire critical attitude and approach.
- 6) The student will acquire knowledge, intellectual competence and critical scholarship.

### **M.A. (English) I. Semester – II**

#### **Course outcomes of Poetry – 2**

##### **Programme Specific Outcomes (PSOs- 8)**

- 1) To enhance artistic sensibility for sounds or word-music and critical appreciation of Poetry as an Art.
- 2) To develop fertile imaginativeness and emotional depth and maturity.
- 3) To perceive subtle nuances and shades of meaning in the use of language.

- 4) To appreciate and assimilate subtle, suggestive and pictorial quality of language.
- 5) To sharpen artistic and critical skills with better grasp and acquisition of qualities like Pictures queness , terseness, conciseness, accuracy, aptness, freshness etc.in expression.
- 6) To acquire the ability to read between the lines.
- 7) To appreciate and acquire the evocative power of language.
- 8) To explore the subjective nature of Truth and Beauty.

**Course Outcomes (Cos- 8)**

1. The Student will be able to critically appreciate and interpret a piece of poetic work.
2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the poet and understand the factors behind his making and evolution.
3. The student will grasp the distinctive poetic style and technique of various poets.
4. The student will understand the socio-political and cultural importance of Poetry and Poetic art.
5. The student will be able to quote the memorable quotations in his speech and writing.
6. The student will be able to understand and apply the evocative power of language.
7. The student will understand and appreciate the subjective nature of Truth and Beauty.
8. The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.

**M.A. (English) I. Semester – II**  
**Course outcomes of Drama – 2**

**Programme Specific Outcomes (PSOs - 9):**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Dramatic art.
- 2) To understand various dramatic types and the origin of the English drama.
- 3) To explore and appreciate the wonder and magic of Renaissance Drama and the greatness of Shakespearean dramatic art.
- 4) To understand and assimilate the laws and principles of dramatic composition.
- 5) To acquire insight and understanding of the mysteries and ironies of human life.

**Course Outcomes (Cos - 9)**

1. The Student will be able critically appreciate a piece of dramatic art.
2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the dramatist and understand the factors behind his making.
3. The student will grasp the distinctive dramatic style and technique of various Play wrights.
4. He will understand the socio-political and cultural significance of Play and dramatic art.
5. He will be able to quote the memorable dialogue and quotations in his speech and writing.

## **M.A. (English) I. Semester – II**

### **Course outcomes of Non-Fiction**

#### **Programme Specific Outcomes (PSOs - 10)**

- 1) To educate students in English with a view to enable them to probe literary & critical theories & contexts that require substantive expertise in literature.
- 2) To foster ideological sense and a sense of social awareness and social understanding.
- 3) To acquire proficiency in expression skills and, critical thinking through various forms of writing with a view to contribute to social debates and public discourse.
- 4) To develop research, critical and analytical attitude & approach in the students.
- 5) To help emerge social thinkers & critics who can take up various social problems and issues that ail the society and impede social change and progress and thus to achieve social transformation and social progress.
- 6) To help grow great leaders, thinkers, visionaries, pundits, experts, educators, managers, consultants, guides, coaches, social analysts, reformers, social activists, crusaders, pleaders, journalists, critical and creative writers professionally in various fields of knowledge.

#### **Course Outcomes (Cos - 10):**

- 1) The student will be able to write sociological and critical reviews.
- 2) The student will be to analyse and interpret social problems and undertake social projects.
- 3) The student will be to compare and contrast different ideas in pubic and social discourse.
- 4) The student will be to apply critical sense and judgment to form an informed opinion.
- 5) The student will be to acquire critical understanding and social and environmental awareness.
- 6) The subject will help grow great leaders, thinkers, visionaries, pundits, experts, educators, managers, consultants, guides, coaches, social analysts, reformers, social activists, crusaders, pleaders, journalists, critical and creative writers professionally in various fields of knowledge.

**M.A. (English) I. Semester – II**  
**Course outcomes of Practical Criticism**

**Programme Specific Outcomes (PSOs- 11)**

- 1) To develop critical, analytical and logical thinking and judgment.
- 2) To grasp and assimilate critical temper and insight.
- 3) To appreciate and analyse critical texts and documents.
- 4) To apply logic, reasoning and sense of discrimination in decision-making.
- 5) To grow in erudition and intellectual scholarship.

**Course Outcome (COs - 11)**

- 1) Student will acquire skill to write critical and scholarly reviews and articles.
- 2) Student will acquire skill to analyse and interpret texts and grasp subtle and deep meaning embedded in the texts.
- 3) Student will acquire skill to compare and contrast different ideas logically and rationally.
- 4) Student will acquire skill to apply critical sense and judgment to form an informed opinion.
- 5) Students will gain skill and competence to perform better in debates, intellectual arguments and Group Discussions and competitive exams.

**M. A. English (Sem-III – Sem-IV)**

Students will able to

- Understand the nineteenth century reforms movement in India and Indian national movement, rise of Indian novel, caste-class
- Have the detail history and study of Indian English literature
- Have aware of social political and cultural issues reflected in Indian writing in English with reference to Indian social transformations, freedom struggle, woman education and empowerment in nineteenth century
- Focus on prose, poetry, drama in English language produced by Irish , Canadian, Australian Indian and African writers
- Have awareness of historical context of literary production and reception by familiarizing students with African literature written in English looking into Africa's past and present and its literary engagement with the theme of colonialism , liberation independence, tradition, modernity, individualisation, community, socialism and capitalism

- Understand the role of English as a medium for political awakening and the use of English in India for creative writing
- Study the critical theories containing classical theories of Plato, Aristotle, Horace and Longinus and the non-classical, romantic theories of John Dryden, Alexander Pope, William Wordsworth and Samuel Taylor Coleridge
- Have a comprehensive idea about the various ages in American literary history
- Compare and contrast the socio, political, religious and cultural differences and transformations as it is found in literatures of different periods in America
- Analyze representative works of African American literature in term of its historical
- Analyze representative works of African American literature in terms of regional cultural and ethnic consideration
- Familiarize with the emergence and growth of Indian writing in English such as the representation of culture, identity, history , construction of nation, national and gender politics, cross cultural transformations
- Appreciate nation-nationalism, counter discourse, subalternity, identity movement
- Have the knowledge about the American dream, race, ethnicity, multiculturalism, realism

**Programme Outcomes and Programme specific outcomes**  
**Master of Arts (M. A.-Economics)**

**PROGRAMME OUTCOMES (POs)**

- 1 To analyse the Economic Issues related to local to global scenarios.
- 2 This programme helps to understand the various Social, Political and Economic Institutions.
3. Applying their knowledge to assess issues in fields of agriculture, industry, banking and finance, environmental, and societal issues to provide practical solutions.
- 4 Formulate and execution of field study, and an industrial visit to get practical exposure to the latest issues.
- 5 To understand how economic policies affect the common people through interactions.
- 6 To utilize the research spheres of Economics.
- 7 The students should be able to find a career in Economics.

**PROGRAMME SPECIFIC OUTCOMES (PSOs)**

- 1 Helps to understand the basic theories of economic growth and development.
- 2 Students will be able to understand the working principles of the Money market and Capital market.

- 3 Students should be able to develop knowledge about production, demand, market and pricing.
- 4 Students can know how to apply the knowledge of Economics in various sectors of society to solve various financial issues.
- 5 Able to understand the role of the public and private sectors in economic development.
- 6 Students should be able to develop knowledge about the role of International trade in economic development.
- 7 Develop, analyse and appraise developmental plan for sustainable development.
- 8 Students should be able to develop knowledge about monetary policy, fiscal policy and its implications for the economy.
- 9 Develop professional entrepreneurial ability and skills.

### **Master of Arts (M. A.-Economics) I Semester – I**

#### **Course outcomes of Micro Economics**

##### **Course Outcome's:**

The student will be able to:

- Cite the basic principles of microeconomics.
- Interpret the concepts of utility, demand-supply mechanism, and elasticity.
- Apply these concepts to solve and analyse various problems of economic policy.
- Analyse the perfect competitive market framework.
- Assess the framework and analyse microeconomic relationships.
- Devise pricing strategies for firms and calculate productivity and costs for the firm.

### **Master of Arts (M. A.-Economics) I Semester – I**

#### **Course outcomes of Macro Economics**

##### **Course Outcomes:**

The student will be able to:

- Explain the evolution of money and know the concept of money and its functions.
- To understand the national income concept.
- Know about the supply of money and high-powered money.
- To give the idea of Keynesian theory of employment.
- To understand the theories of the consumption function.
- To give an idea about how to make a saving and investment.
- Evaluate the working and effects of monetary and fiscal policy.

## **Master of Arts (M. A.-Economics) I Semester – I**

### **Course outcomes of Statistics for Economics**

The student will be able to:

- The students should be able to describe the basic concept of statistics.
- The students should be able to understand the significance of statistics in Economics
- The students should be able to understand the issues regarding the survey, data collection, classification, tabulation & presentation of data.
- The students should be able to understand the role of CSO & NSSO
- The students should be able to calculate & apply the measures of central tendency, dispersion, skewness, correlation & regression.

## **Master of Arts (M. A.-Economics) I Semester – I**

### **Course outcomes of Agricultural Economics**

Course Outcomes:

- Explain the scope and subject matter of agricultural economics.
- To understand the rural infrastructure and agricultural production.
- To analyze the issues related to agricultural and economic development.
- Deals with the farm management and types of agricultural risk.
- To understand the Labour Supply, Mobility of Labour and Segmentation in Labour Markets.
- Evaluate the problem of agricultural finance and suggestion to improve agricultural finance.
- Know about agricultural growth in India and the effects of globalization.

## **Master of Arts (M. A.-Economics) I Semester – II**

### **Course outcomes of Rural and Urban Development**

Course Outcomes:

- To understand the concept of urbanisation and study urbanisation in developing countries.
- To know the factors related to urbanisation and see the pics of urbanisation on the economy.
- To know the meaning of urban planning understand Megha and Smart City planning.
- To understand the problems of urbanisation and to know the relation between factors of urbanisation and urban development.
- To know the government policies about urbanisation & rural development
- To impart better education from classroom to common man.
- To understand the development gap between urban and rural areas
- To know the understanding and availability of resources for rural development.
- To understand the employment opportunities and reasons of employment opportunities and reasons of unemployment in rural & urban areas.

## **Master of Arts (M. A.-Economics) I Semester – II**

### **Course outcomes of Micro Economics –II**



**Course Outcomes:**

The student will be able to:

- Report a thorough understanding of the basic principles of microeconomics.
- Interpret the Monopolistic market framework, and apply it to microeconomic situations.
- Illustrate the features of the Oligopolistic market.
- Break down the nuances of welfare economics.
- Review the above concepts to solve and analyse various problems of economic policy.
- Devise and apply game-theoretic solutions for economic decision-making.

**Master of Arts (M. A.-Economics) I Semester – II****Course outcomes of Macro Economics -II****Course Outcomes:**

The student will be able to:

- This course is useful for understanding various real economic issues and evaluating them.
- Policy outcomes
- To consider the role of the Industry and Service sector in the economy of Maharashtra.

**Master of Arts (M. A.-Economics) I Semester – II****Course outcomes of Statistics for Economics – II****Course Outcome's:**

- The students should be able to understand the concept of Sampling & Estimation.
- The students should be able to use of sample survey on various issues
- The students should be able to test of Hypothesis by using various statistical Test
- The students should be able to understand time-series trends & calculate it for forecasting
- The students should be able to understand & Uses of Probability
- The student should be able to calculate Index Number.

**Master of Arts (M. A.-Economics) I Semester – II****Course outcomes of Industrial Economics****Course Outcomes:**

- To create an understanding of the role of industries in economic development.
- To know the government's industrial policy since 1948 and from the period of economic reforms.
- It is useful to know the impact of new economic policies on the industrial sector of India.
- It is important to study regional imbalance in industrial development.
- Creating knowledge about the trade union movement in India and labour market reforms.
- It is important to know the need for foreign capital for industrial development.

## **Course outcomes**

### **M. A. (Sem-III – Sem-IV) – Economics**

Students will be able to

- Know the basic concept in economics
- Understand the demand analysis, consumer behaviour and elasticity demand, theory of production and costs, cost and revenue
- Know the theory of employment and consumption function, multiplier and investment function, demand for money and supply of money
- Understand the statistics for economics, correlation and regression
- Understand the agriculture, economic development, rural infrastructure, agricultural production, Rural labour market, rural finance and agricultural prices, agricultural growth in India and external sector
- Understand the history of economic thoughts in which they study pre adamite thoughts
- Know the classical economics, critics of classicism, modern economic thought
- Understanding the urban economics in which they study the urbanization of in India, urban problems and urban planning in India, urban finance management and theory of local finance
- Study the public economics, public expenditure and taxation, public debt, fiscal policy and federal finance with public choice
- Study the economics of education, education and economic development in India, demand and supply health, financing health care, woman-demographic aspects
- Price and output determination I and II, Duopoly and Oligopoly, theory of distribution and welfare economics
- Understanding the theory of inflation, inflation of developing economics, post Keynesian demand for money, trade cycle and financial markets
- Know the statistical economics in which they can study sampling and estimation, time series, probability, index numbers
- Understand industrial economics, industrialisation, industrial location and regional development, profitability and investment, industrial policy and labour
- Understand the concept of rural development, rural resources, cooperative movement, labour and scheme of rural development
- Study the nature of human development, its measurement, human development and expenditure in India, social capital
- Understand the environmental economics, environmental problems of agriculture development, environmental problem of industrial development, environmental problems and policies in India
- Understand the meaning, definition of co-operation, work and function, financial institute, account and audit, cooperative legislation in India

- Understand the economic growth, development and planning, International trade and finance, recent developments in international trade theories, trade and growth, balance of payments
- Understand the Indian economic policy, poverty, employment and income distribution, agriculture policy, industrial policy, infrastructure, social security and service sector
- Understand the financial institution and market, nature and role of financial system, the control bank and monetary policy, banking system in India, financial sector reforms and non bank financial institutions, national and international financial market
- Know the labour economics, employment, wage determinants, absenteeism and labour turnover, labour market reforms
- Know the research methodology, collection of data and sampling techniques, processing and analysis of data, interpretation of data and report writing
- Understand the problem in regression analysis regression with qualitative independent variables, dynamic econometric models, violation of the assumption
- Understand the international trade and finance, regional economic blocks, WTO and India, MNC and foreign trade
- Have the knowledge about the Indian economic policy, impact of globalization, monetary and fiscal policy, economic planning and policy
- Understand the business cycle and demography, fertility, nuptiality and mortality, migration and urbanization, demographic data base and population policy in India
- Understand the welfare economics and economics of insurance

### **Programme Outcomes and Programme specific outcomes**

#### **Master of Arts M.A. (Political Science)**

##### **POs:**

1. Familiarity with different approaches to the study of Political Science and an ability to apply this to contemporary political problems.
2. An ability to formulate and construct logical argument about political phenomena.
3. Comprehend the basic structure and functions of government systems and theoretical understandings.
4. Analyse political problems, argument, information, theories.
5. Apply methods appropriated for accumulating and interpreting data applicable to political science.
6. An ability to analyse the election data and to develop leadership qualities among students.

##### **PSOs:**

1. Ability to discuss about Indian Constitution and Political process. student to grasp knowledge of provisions in constitution of India regarding fundamental rights, Directive principles, Parliament, judiciary and executive body at centre and state.
2. Learn about the various Political thought in Maharashtra like Dr.B.R. Ambedkar, M.G. Ranade, Dr. Punjabrao Deshmukh, and Mahatma Phule etc.
3. Student are acquainted with the Indian political thought and western political thought various ideologies like Feminism, liberalism, socialism, Environmentalism etc.
4. Student are acquainted with the Theories and aspects of international relations, nonalignment movement, new world economic order etc.
5. Learn about the political process in India and acquainted with Governance and public policy in India.
6. Students are able to develop leadership qualities and Election analysis.
7. Understanding & Analysing the nature and developments in national and international politics.

### **Master of Arts (M. A.- Political Science) I Semester-I&II**

#### **Course outcomes of Indian Political Thought**

#### **Objectives:**

- To make student acquainted with the evolution of Indian Political Thoughts from Kautilya to Ram Manohar Lohiya.
- To make students aware of various Political Thought processes and Ideological streams in Indian Political Thought.
- To provide the students comprehensive knowledge on contribution of various Political Thinkers from Kautilya to Ram Manohar Lohiya.
- To develop an understanding among students on the ideological foundation of nation building in India.
- After the successful completion of the course the students will acquire an in-depth knowledge on various political thoughts from Kautilya to Ram Manohar Lohiya.

#### **Learning Outcome:**

- The students will be able to understand the contribution and thoughts of the makers of Modern India.
- The students will analyse the knowledge of various Ideological Streams in Indian Political Thought.
- Analyse and compare the ideas and theories of Indian Political Thinkers.

### **Master of Arts (M. A.- Political Science) I Semester-I&II**

#### **Course outcomes of Indian Government and Politics**

**Objectives:**

- To make students acquainted with the evolution and framing of the Indian Constitution
- To make student aware of their fundamental rights enshrined in the Indian Constitution.
- To provide the students comprehensive knowledge on the functioning of Indian Federal and Parliamentary System.
- To develop an understanding amongst students on functioning of various constitutional bodies and their responsibilities.
- To Prepare students for the competitive examination at the central and the state level
- To transform the students into responsible citizens of India.

**Learning Outcomes:**

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

- Understand & explain about constitutional Development in India.
- To understand the philosophy of Indian constitutions.
- To understand the various Government of India acts their provision and reforms.
- They also know about different constitutional authorities in India such as Election Commission, Finance Commission, and CAG.
- Critically analyzing the important institutions of the Indian Union: the Executive: President; Prime Minister.
- Assessing the nature of Indian Federalism with focus on Union-State Relations

**Master of Arts (M. A.- Political Science) I Semester-I&II**  
**Course outcomes of Public Administration**

**Objective:**

- The course provides an introduction to the discipline of public administration.
- This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories.
- To acquaint the students with the concept of Public Administration, its theories of management and organization and to imbibe its significance as a growing discipline.

**Learning Outcomes:**

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

- Discuss the Evolution of Public Administration.
- Student can compare about private and public Administration.
- The students will be explain & critical Analysis about various Approaches to the Public Administration.
- The students will become familiar with details of administrative organisation.

**Master of Arts (M. A.- Political Science) I Semester-I&II**

## **Course outcomes of International Relations**

### **Course Objective:**

This paper deals with the different approaches and methods of studying international relations along with an emphasis on some important contemporary issues. One very important component of this paper is the theoretical postulates about power and the actual operation of it in contemporary international politics. This paper deals with concepts and dimensions of international relations and makes an analysis of different theories highlighting the major debates and differences within the different theoretical paradigms. The concept of non-alignment, arms control and disarmament in detail and analytically.

### **Learning Outcomes:**

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

- Explaining scope and subject matter of International Relations as an autonomous academic discipline.
- Critically analyze the theories of international politics.
- Evaluate the concept of power and its changing nature.
- Explore the instruments for the promotion of national interest.
- To analyse the international security Arms Race. Arms control and Disarmament.
- Understand about various dimensions and emerging issues of international politics.
- To familiarise the students regarding different theories and the relevant debates in the discipline of International Politics.

## **Master of Arts (M. A.- Political Science) I Semester-I&II**

### **Course outcomes of State Politics in India**

#### **Objectives:**

This Course intends to introduce the students to the importance of political Profile at the state level as part of the study of Indian politics. Secondly, it expects that the students adopt a comparative approach to the study of states— while identifying special features of politics of each state, the students would also understand the comparability of those special features with other states. This Course aims at making the students aware of state politics in India. It introduces the students to the relation between state politics and national politics, the different, determinants of state politics, the constitutional framework at state level, and the emerging trends in state politics in India.

#### **Learning Outcomes:**

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

- Understanding about the historical and emerging trends in political process in the India states.
- Explain various Patterns of state politics.
- Understand the constitutional system at state level, and the relation between state politics and national politics.

- Explain Areas of state-centre conflict in Indian federation .
- Critically examine Issues of state politics like Linguistic, regional, religious

**Master of Arts (M. A.- Political Science) I Semester-I&II**  
**Course outcomes of Governance and Public Policy in India**

**Objectives:**

- 1) To develop an understanding on Governance and Public Policy in India.
- 2) To make students aware of ongoing debates in. Governance and Public Policy in India.
- 3) Introduce students to the various Public Policy in India

**Learning Outcome**

- After the successful completion of the course the students will acquire an in depth knowledge of the Governance and Public Policy in India.
- The students will be able to explain the functioning of the Governance and implementation Public Policy in India.

**Master of Arts (M. A.- Political Science) I Semester-I&II**  
**Course outcomes of MAJOR ISSUES IN CONTEMPORARY WORLD POLITICS**

**Objectives:**

This course aims to help students to identify and conceptualize the major issues in the 21st century world politics. It also intends to enable students to identify the major national/transnational actors engaged in dealing with these issues at various levels in international politics .

**Learning Outcomes:**

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

- Explain the new world order in the context post cold war and crisis of globalization and the global pandemic.
- Examine Chinese challenge to US hegemony and its impact on world order.
- Explain and Critique Changing nature of Terrorism.
- student can analyse Changing nature of security.
- student Examining the issues of International Inequality, Dependency.

**Master of Arts (M. A.- Political Science) I Semester-I&II**  
**Course outcomes of Political Thought in Maharashtra**

**Objectives**

- 1) To make students acquainted with the political thought in Maharashtra.

- 2) To make students aware of various political thought processes and ideological streams in political thought.
- 3) To provide the students comprehensive knowledge on contribution and importance of various political thinkers in Maharashtra.
- 4) To develop an understanding amongst students on the ideological foundation of nation building in India.

### **Learning Outcome**

- After the successful completion of the course the students will acquire an in depth knowledge on various political thoughts and movements in Maharashtra.
- The students will be able to understand the contribution and thoughts of the maker so modern Maharashtra.
- The students will analyses the various ideological streams in Maharashtra Political Thought.
- The students will be able to understand the contribution of Maharashtra Political thinkers in Nation building of India.

## **Master of Arts (M. A.- Political Science) I Semester-I&II**

### **Course outcomes of Political Process in India**

#### **Objectives**

- To make students acquainted with the political process in India.
- To make students a ware of the political issues in the Indian politics.
- To provide the students comprehensive knowledge on the working of political party System in India.
- To develop an understanding amongst students on Issues in Indian federalism
- To provide the students comprehensive knowledge on Political Movements.

#### **Learning Outcome**

- After the successful completion of the course the students will acquire an in depth knowledge of the basic features of political process in India.
- The students will be able to underst and the issues of the Indian politics.
- The students will analyse the knowledge of political parties in India.
- The students will be able to understand the political movements.

## **Master of Arts (M. A.- Political Science) I Semester-I&II**

### **Course outcomes of SOCIAL MOVEMENTS IN INDIA**

#### **Course Objective:**

Social movement have inextricably become a part of modern mass democracies. Social movement try to influence the decision making process indirectly and that no political system is actually free from them.Social movements highlight the issues and concerns of marginalized groups who are by passed within society. This course focuses on the various aspects of different sicial movements. The object of



this course is to provide students the relation between civil society, contemporary social movement and development agendas.

### **Learning Outcomes:**

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

- Understand meaning & Nature of Social movement.
- explain various approaches of social movement.
- analyse Social Movement and Social Change.
- comparative study of old and new social movement.
- Develop a working knowledge on how the people of India are organizing to achieve social justice and working to find solutions to economic, social and political problems.

### **M. A. (Sem-III – Sem-IV) - Political Science**

Students will able to

- Know the western political thought and theory, classical thoughts of Plato and Aristotle
- Understand the social contract, utilitarianism, scientific socialism in which Fredrich Hegel and Karl Marx are studied
- Know the revolt against reason from John Rawls, Robert Nozick, Hayeks
- Study the research methodology,, political sociology, Historical sociology, social basis of political groups, Political Elites
- Have the knowledge about diplomacy, recruitment and training, power, function and qualities of diplomate
- Understand the meaning, nature, grades, & functions of CONSULS, Process of making Foreign policy
- Have the knowledge about the international law and international organization, the law of war, development of international organization
- Acquire the knowledge about western political thoughts, democratic socialism, behaviourism, political theory, concept and perspectives on state

### **Programme Outcomes and Programme specific outcomes**

#### **Master of Arts (Programme - M.A. Marathi)**

#### **POs (Course Outcomes):**

1. Knowledge of the interrelationships of various spheres of life will be gained. Also understand its complexities By taking the vision of understanding the life on the broad spectrum of universal humanity will be achieved.
2. By understanding the changing conditions of personal and public life, it will develop the creativity and creativity to think wisely and deal with it.

3. Willingness to lead a self-reliant life with dignity and self-respect and to cooperate with others in that regard can be exercised.
4. Practical application of knowledge can be achieved by increasing inquisitive attitude, curiosity and curiosity.
5. Clinical and comparative studies will develop vision. Hence, the process of creative alternatives will be developed by developing a timely awareness of the theoretical and practical problems of life.
6. The purpose of language in human civilization and its application in changing times with awareness of language can be done Moreover, one can acquire a multilingual and multicultural reputation.
7. Having the right mindset and attitude can lead to a confident life.
8. Employment can be enabled by developing information and technology skills.

**PSOs (Course Specific Outcomes):**

1. Sant Gadge Baba Amravati University M.A. Department of Human Sciences. Studying the Marathi syllabus will make the concept of literature clear and increase the students' taste.
2. Practitioner understanding of Marathi society, language, history, literature and culture in contemporary changing context.
3. The study of language and literature at the social as well as the artistic level leads to the practical application of literature by developing prudential rationality and compassionate sensitivity.
4. The development of a critical, comparative and critical vision allows for the proper study of writing in various literary genres, research and creative production
5. Philosophical study of language will lead to linguistic skills for obtaining prestigious employment

**Master of Arts (M. A.- Marathi) I Semester-I**

**Course outcomes of Cultural and Social Background of Marathi Literature (Beginnings to 1818)**

1. The students' foundation of social and cultural background of literature will be solidified.
2. Comprehension of literature will increase.
3. There will be preparation for UPSC, MPSC, NET-SET and other competitive exams.

4. The study will be useful for newspaper writing-editing.
5. The horizons of knowledge will widen if one wants to enter the teaching profession.

### **Master of Arts (M. A.- Marathi) I Semester-I**

#### **Course outcomes of Literary thought**

1. There will be a deep understanding of the similarities and differences between fine literature and other writings (conceptual literature, history, philosophy).
2. Literary sensibility will become more nuanced and broader by developing the ability to respond to a literary work.
3. Ability to present your response in a rational manner by looking at the literary work in a more clinical way.
4. Literature can be described, analyzed and evaluated.
5. An interesting article can be written on a literary work.
6. The relationship between literature and life can be treated.

### **Master of Arts (M. A.- Marathi) I Semester-I**

#### **Course outcomes of Folklore**

- 1) What is folk literature, it can be said.
- 2) Elements of folklore can be studied objectively,
- 3) Factors affecting public affairs can be stated.
- 4) Elements of folklore can be evaluated.
- 5) Socially beneficial folk principles can be conveyed to the people.
- 6) People can be made aware of outdated customs and traditions.

### **Master of Arts (M. A.- Marathi) I Semester-I**

#### **Course outcomes of A special literary form is poetry**

1. Poetic sense, taste will be enriched,
2. Poetry in competitive exam syllabus will be useful for studying this literary genre.
3. If one wants to work professionally as an editor, the understanding of poetry will be enriched.

4. Studying poetry will be useful if one wants to take up the profession of teaching. If you want to write poetry, your poetic sense will be enriched.

### **Master of Arts (M. A.- Marathi) I Semester-II**

#### **Course outcomes of Cultural and Social Background of Marathi Literature (1818 to 1960)**

1. The social and cultural background of literature will strengthen the foundation of the students.
2. Comprehension of literature will increase.
3. Prepare for UPSC, MPSC, NET-SET and other competitive exams,
4. The study will be useful for writing-editing the thesis.
5. The horizons of knowledge will widen if one wants to enter the teaching profession.

### **Master of Arts (M. A.- Marathi) I Semester-II**

#### **Course outcomes of review thoughts**

1. The concept of review will be clarified and understanding of its objectives, importance and indispensability will increase.
2. The steps in the review process can be analyzed.
3. Compare the similarities and differences between various literary debates and evaluate their historical function.
4. Students' tastes will develop by increasing their ability to understand, describe, appreciate, analyze and evaluate literature
5. Gandhianism, Ambedkarism and Deshiism can be explored and commented upon.
6. A literary critical essay can be written.

### **Master of Arts (M. A.- Marathi) I Semester-II**

#### **Course outcomes of Folklore**

1. It can be said what is folk literature.
2. The oral tradition of folklore can be studied objectively.
3. Traditions that influence public affairs can be mentioned.
4. Folk literature and folk arts can be evaluated.
5. People can be enlightened through folk arts.

### **Master of Arts (M. A.- Marathi) I Semester-II**

#### **Course outcomes of Special Literary Drama**

1. The concept of drama as a literary form will be clear to the students.

2. The study of this textbook will develop the ability to understand, appreciate and evaluate drama.
3. A rich awareness of human life will be created in the students by showing various human tendencies through drama.
4. Studying the elements of drama production will inspire students to create drama.
5. Students who wish to pursue a career in theater may find this study guide useful.

### **Course outcomes**

#### **M. A. ( Sem-III – Sem-IV) – Marathi**

Students will able to

- Acquire the facility in the use of Marathi language
- Produce valuable knowledge in Marathi
- Have the knowledge about the cultural background Marathi literature
- Understand literature thoughts, Loksahitya and santsahitya
- Criticise thoughts, Mahanubhav literature
- Read the Novel, Drama and Autobiography
- Understanding Interrelation between literature and society
- Understanding the social, cultural religious and political background in time of Yadav
- Understand the Varkarisampraday, Uday, social status, reasons, social work of santDnyaneshwar and Namdevanchimandiyali
- Shivakal and peshvaiKal
- Loksahitya, Lokgeete, Loknatya, Lokkatha types
- Understanding the thoughts of society reformers like, MahadevGovindRanade, Mahatma Jyotiba Fule, Doctor Babasaheb Ambedkar their effect on liberty movement
- Have the knowledge of Bhashavidnyan
- Study the thoughts and literature of different saints in Maharashtra
- Apply the study of Marathi linguistics and Marathi grammar in their practical life
- Develop reading writing and communication skills in Marathi

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy in the Faculty of Humanities**

##### **Ph. D. (Marathi)**

- To understand the basic conceptual knowledge, importance and its application to actual research
- To understand the importance in the study of research in Marathi literature
- To understand the literature review process and formulation of research problem

- To develop the skill of understanding resources, literatures, ability to review and capacity to explore the issues for research
- To equip with various tools and techniques of data collection, classification and verification, interpretation and recourse to resources for research
- To learn technical writing and ICT skills required for the research
- To create awareness about intellectual property rights and patents

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Marathi)**

Researcher will able to

- Gain the knowledge and skills for the awareness of each and every aspect related to the Marathi language
- Make career as a language expert, Marathi writer, translator, literary critic, teacher etc
- Undertake various roles in the domain associated with the uses of the Marathi language
- Develop an expertise in the language by getting into the insight of the language
- Create authentic content in the language for Marathi journals, newspaper and multimedia
- Make comprehensive and contrastive analysis of Marathi language and literature with other languages and literature in other languages
- Have a proficient and can work as a critic in Marathi literature
- Make the society sensitive and sensible through reading and writing

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy in the Faculty of Humanities**

#### **Ph. D. (English)**

- Acquire advanced knowledge of literary, cultural, and critical studies
- Demonstrate depth of knowledge in the field of specialization for research and teaching
- Develop skills in public and oral presentation through participation in seminars, conferences, and in course presentation
- Acquire ability to teach literature and culture at the university level and the society

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (English)**

Researcher will able to

- Acquire subject specific knowledge and skills in the area of specialization and improving the research methodology

- Promote publications in scholar journals
- Ability to present research findings in academic context, the English literature
- Develop the personal skill for the successful career in research

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy in the Faculty of Humanities**

##### **Ph. D. (Philosophy)**

- Acquire the basic conceptual knowledge, importance and its application to actual research
- To equip with various tools and techniques of data collection, classification and verification, interpretation and recourse to resources for research
- To learn technical writing and ICT skills required for the research
- To create awareness about intellectual property rights and patents
- Gain the knowledge and skills for the awareness of each and every aspect related to the Philosophy
- To aware and acquire various skills of research methodology and implementation of various research techniques

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Philosophy)**

Researcher will able to

- Students can give a through detailed account of the history of philosophy
- Know the research ethics, IPR related mechanism, citation styles etc
- Enhance and facilitate educational, social and economic growth locally, nationally
- Develop competencies in the broad issues of conducting and evaluating research in education and develop the skills needed to develop a research problem
- Analyze critically synthesize and utilised information and data related to one's field of study
- Proficiently communicate information in a manner relevant to the field
- Prepare students for an academic career in philosophy and more specifically

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy Ph. D. (Chemistry)**

- To develop new technology for the waste water management.
- Think scientifically to solve the problems independently.
- Critical thinker to carryout environment friendly reactions, maintained all the data and analyse the result scientifically.
- Able to aware the community about the hazardous effect of chemistry to the environment.
- Able to carry out reaction via green chemistry route.

- Use advance techniques, instruments and Chemistry software's
- Gain the knowledge of research through experimental work.
- Able to elaborate the methodology of research, how to write research papers and short communications for society etc.
- Identify the methodology for the removal of heavy metal ions from the wastewater and design eco-friendly technique for the removal of heavy metal ions from the waste effluent from the industry.
- To reduce COD and TDS from the industrial wastewater.
- Understand good laboratory green practices.

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Chemistry)**

Researcher will able to

- Treatment of waste water by cheap adsorbents.
- Adsorption technique used for this process is eco-friendly, non-hazardous and cheap.
- Easily scale up from lab scale to industrial scale up.
- To analyse the concentration of toxic metal ions and various parameters in drinking water.

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy Ph. D. (Botany)**

- To develop theoretical and practical understanding through research into aspects of plant sciences
- Provides plant genetic engineering, plant development, plant ecology, plant taxonomy, plant physiology etc
- Understanding the biodiversity in relation to the flora in field and forest degradation
- Application of Botany in agriculture through the study of plant pathology

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Botany)**

Researcher will able to

- Analyze relevant literature and apply to the development of innovative research
- Develop abstraction and analytical procedures with an appropriate level of statistical validation
- Free in designing the original research and preparing that data in a format suitable for publication in Journals
- Enhance skills in time management, good laboratory practices, safety and planning a specific programmes of research
- Do research in Taxonomy of medicinal plants which India has huge Medicinal value related plants



- Have awareness among the techniques and suitability of crops
- Produce significant scientifically reliable research results
- Build up awareness and perspective as a member of a local, national and global scientific community

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy Ph. D. (Electronics)**

- To develop research tempo in students of rural region
- Design system for public safety and offer solutions to the social and environmental concerns
- Apply research based knowledge to conduct experiments, Analyze and interpret the data to develop electronics tool and applied them for social development
- Apply the contextual knowledge to access cultural, social, safety and health issues and endure the consequent responsibilities relevant to the professional engineering practice
- Share the science and engineering activities to technical society for documentation and presentation
- Develop ethical and professional responsibilities in science and technology
- Select advanced scientific and research based hardware and software tools to solve complex electronics and technological problem and used for industrial applications
- Apply the basic concept of electronics digital and communication in science and technology to design variety of components and system for applications including data acquisition, robotics, embedded system, signal processing, image processing, microcontroller based design, communication, networking, VLSI and control system
- Create awareness of professional science and engineering solutions in societal, environmental context, professional ethics and able to communicate effectively

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Electronics)**

Researcher will able to

Understood the basic knowledge about the various sensors and data acquisition system applied in sensor network

- Understood fundamental concepts of embedded and control system and studied parameters such as modelling, time response and frequency response etc
- Developed concepts of stability and its assessment
- Learn the various parameters and their interrelationship to solve electronics circuits with series, cascade and parallel connection using various parameters
- Used the concept of virtual instrumentation and developed circuits

### **Programme Outcomes and Programme specific outcomes**

### **Doctor of Philosophy Ph. D. (Mathematics)**

- Researcher undergoes relevant courses required for specialised research
- Articulating ideas and strategies for addressing the research problems
- Effective communicating research through Journals publications and conference presentations to the mathematics community
- Provide scope for interaction with international researchers and developing collaboration
- Produce next generation researchers in mathematics
- Researchers in mathematics will be able to think critically and creatively
- Researchers in mathematics will effectively communicate their field of study
- Researchers after completing the Ph. D. programme will obtain good jobs

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Mathematics)**

Researcher will able to

- Acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematics
- Have the thorough knowledge in abstract algebra of mathematics
- Have the knowledge gain in module theory as a linear algebra over the ring
- Acquire the knowledge of special class of modules like free modules, projective module etc
- Develop competency in handling problems involving module theory
- Deal with module theory which is indispensable in wide ranges of mathematical disciplines
- Understand tensor product in modules, category and functors, exact functors, Ext and Tor
- Extend the field of supplemented modules almost projective modules and almost injective modules.

### **Programme Outcomes and Programme specific outcomes**

#### **Doctor of Philosophy Ph. D. (Zoology)**

- To initiate research in classical and modern aspects of life intricacies besides exploration, prevention and conservation of the local biological resources.
- Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms
- To prepare the biodiversity register with the help of local people.
- Apply the knowledge of cell, its functions in control of various functions of organisms.
- To prepare the youths of the region to competes at National & International level through imparting training in fundamental and applied Zoology and allied disciplines to serve the society and the Nation.

- Understanding of environmental conservation processes and its importance and protection of endangered species
- Gain knowledge of culture, farming and vermicompost preparation.
- Understands about various concepts of genetics and its importance in human health
- To understand basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology
- Laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Fish biology, Animal biotechnology, Immunology and research methodology
- The student of rural backgrounds should extra acquire information more than they ordinals encountered in general biology course.
- To acquire knowledge about research methodologies

### **Course outcomes**

#### **Doctor of Philosophy Ph. D. (Zoology)**

Researcher will able to

- Do the distribution of fauna in different realms interaction
- Understand Animal behavior and response of animals to different instincts
- Interaction of biota and abiota
- Understand Various kinds of Animal adaptations Animal Diversity ,Vertebrates & Developmental Biology:
- Imparts conceptual knowledge of vertebrates, their adaptations and associations in relation to their environment
- Know the basic concepts of developmental biology Cell Biology, Genetics and Evolution:

