Shri Shivaji Education Society, Amravati's

Shri Shivaji Arts, Commerce & Science College, Motala, Dist. Buldana

Academic Year 2021-22

President	Principal	Founder President
Hon'ble Harshvardhan P. Deshmukh	Dr. S.W.Mamalkar	Dr. Panjabrao alias Bhausaheb Deshmukh

❖ *Program outcomes*

❖ *Course outcomes*

Program Outcomes and Course Outcomes

Program 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

Name of the Program: B. Sc. Mathematics

Program Outcomes

- Understanding of major concepts in all discipline of mathematics.
- Formulate and develop mathematical arguments in a logical manner.
- Acquire good knowledge and understanding in advanced mathematics.
- Create an awareness of the impact of mathematics on the environment, society and development outside the scientific community.

Course Outcomes

B. Sc. I Semester-I Mathematics Paper-I

Algebra and Trigonometry

Students will able to

- Understand and application of De Moivre's theorem in finding the roots of complex numbers, separation of real and imaginary parts of the circular and the hyperbolic functions of complex variables.
- Find the Gregory series, Machin's series, Euler's series, Rutherford's series, summation of series, series based upon sin x, cos x, sinh x, cosh x, exponential series, logarithmic series and series based upon Gregory series.
- Understand quaternions its Definition, concept of Equality and addition, multiplication of quaternions, complex conjugate of a quaternion, norm, inverse, quaternion as a rotation operator, and its geometric interpretation. special quaternion product, operator algorithm, quaternion to matrices.
- Know the relations between the roots and coefficients and can find roots of the polynomial Use the transformation of equations Solve the cubic equations using Cardon method, Solve biquadratic equations
- Find the rank of a matrix, row rank, column rank, eigenvalues, eigenvectors and the characteristic equation of a matrix, Verify Cayley- Hamilton theorem and its application.

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

Students will able to

- Understand the concept and definition of a limit of a function and continuity and the basic difference between them.
- find the limit of the function and verify the continuity of the function.
- Verify types of discontinuities and problems based on it.
- Familiar with the techniques finding the derivatives using successive differentiation.
- Apply Leibnitz theorem for successive differentiation of multiplication of two different functions
- Identify and apply the L'Hospital's rule in case of indeterminate form of the limits.
- Verify Rolle's theorem, Lagrange's Mean Value Theorem, Cauchy's Mean value theorem and their application.
- Know the Maclaurin's and Taylor series expansions and their applications in solving problems for finding their power series expansion.
- Understanding and solving the partial derivatives problems homogenous functions and verify the Euler's theorem.
- Know the quadrature, rectification.

B. Sc. I Semester-II Mathematics Paper-III
Course Outcomes of Differential Equations: Ordinary and Partial

Students will able to

- Determine Degree and order of a ordinary differential equation,
- Solve linear differential equations and differential equations reducible to the linear form. Verify and solve the exact differential equations.
- Solve differential equations of first order and higher degree using the methods differential equations solvable for p and y, differential equations in Clairaut's form and find the orthogonal trajectories.
- Complementary function for the homogeneous linear differential equation and Particular integral of the linear ordinary differential equations.
- Study and apply the reduction of order, transformation of the equation by changing the dependent variable and independent variable,
- Learns the normal form (removal of first order derivative) and the method of variation of parameters
- Find the solution of Ordinary simultaneous differential equations.

- Form partial differential equations,
- Find the solution of total partial differential equations of the first order or Pfaffian using various methods.
- Solve the Lagrange's method, some special types of equations which can be solved easily by methods other than the general method.
- Solve Compatible differential equations. Use Charpit's general method of solution, Learn and find the solution of partial differential equations of second and higher orders. Solve Homogeneous and non-homogeneous equations with constant coefficients.

B. Sc. I Semester-II Mathematics Paper-IV
Course Outcomes of Scalar and vector Analysis and Geometry
Students will able to

- Have knowledge of Scalar and vector product of three vectors, and solve the product of four vectors, vector differentiation and vector integration.
- Have knowledge of the geometry of space curve t, n, b vectors, fundamental planes, Frenet - Serret formulae.
- Find the curvature, torsion,
- Define and find the Gradient, divergence and Curl, directional derivative, line integral (existence and evaluation),
- Find and evaluate the work done, and apply the Greens theorem.
- Solve the problems of lines in three dimensions, planes of different forms of spheres.
- Have the knowledge different forms of spheres. Section of a sphere by a plane and their geometry by using their algebraic equations.
- Have the knowledge of intersection of sphere and a line. Condition of orthogonality of two intersecting spheres
- Study the equation of cone with guiding curve, equation of cone with vertex and origin.
- Equation of right circular cylinder and its geometry.

B. Sc. II Semester-III Mathematics Paper-V
Course Outcomes of Advanced Calculus
Students will able to

- Have a 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 theorm, 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 τ *and* o functions, Mobius μ 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 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 characterization of normal subgroups, algebra of normal subgroups, quotient group.
- Define and verify Homomorphism, homomorphic image, kernel of homomorphism, isomorphism of a group, Fundamental theorem on homomorphism of a group, natural homomorphism, second isomorphism theorem, third isomorphism theorem.
- Define and verify left ideal, right ideal, examples, algebra of ideals, prime ideal, maximal ideal, principle ideal, quotient ring, ring homomorphism.

B. Sc. II Semester-IV Mathematics Paper-VIII
Course Outcomes of Classical Mechanics

Students will able to

- Understand the concept of Constraints, generalized coordinates,
- State and prove D' Alembert's principle and 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 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 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, recurrence formula, orthogonality of Legendre's polynomial, Rodrigue's formula.
- Define and evaluate Bessel's equation, solution of Bessel's equation, generating function.
- Understand Recurrence formulae. 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 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

Name of the Program: B.Sc. PHYSICS

Program outcomes

After the completion of B. Sc. Physics program there are various options available for science students, they can pursue a master degree in physics, work in related field, and can look also towards the professional job oriented courses. Students after the graduation in science faculty can also eligible and apply to the various competition examinations such as UPSC, MPSC, SSC, Banking, RRB etc.

After successful completion of three year degree program in Physics, a student will be able to:

- Understand the depth knowledge of various subjects and topics of physics.
- Develop Scientific temper and Scientific thinking.
- Demonstrate skills and competencies to conduct scientific experiments.
- inculcate the scientific treatment in the students and outside the scientific community.

Course Outcomes of Physics

B. Sc. part-I Semester I

Students will able to

- Know the Newton's law of gravitation, Kepler's laws of planetary motion
- Study of acceleration due to gravity, variation with altitude and depth, gravitational field, gravitational potential, intensity due to uniform solid sphere at a point inside and outside the sphere.
- Have the knowledge of the translational, vibrational & rotational motion.
- Find out moment of inertia.
- Understand the concept of linear & angular momentum and their conservations.
- Understand the concept of SHM, Differential equations and solution.
- Know the damped & forced harmonic motion, Resonance.
- Know the concept of elasticity & plasticity, different elastic constants.
- Know the viscous properties of fluid. understand Bernoulli's theorem, Reynold's number, study property of matter, surface tension.
- Understand above concepts through experiments in laboratory.
- Develop numerical solving technique in students.

Course Outcomes B.Sc. Physics

B. Sc. I Semester-II

Students will able to

- Have knowledge about the kinetic theory of gases.
- Understand Brownian motion, Avogadro's number & specific heat.
- Study Transport phenomenon in gases and understand the concept through experiments in laboratory.
- Know the laws of thermodynamics, Carnot's heat engine & Carnot's theorem, Entropy.

- Know the Joule-Thomson effect.
- Understand liquification of hydrogen & helium.
- Study thermodynamic variables.
- Know the motion of charged particle in electric & magnetic fields, working principle of electron gun, Discharge tube & mass spectrograph.
- Study linear (Linac) accelerator & Cyclotron.
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students
- Know the network theorems, understand Ballistic galvanometer, study Varying current.
- Know the concept of alternating current, understand applications of j-operator & complex number, study resonance & transformer.
- Understand above concepts through experiments in laboratory and develop numerical solving technique in students.

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 a 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.

- 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 a 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.

Name of the Program: B. Sc. Chemistry

Program Outcomes

- Program develops scientific temperament and attitude among the science graduates
- The qualities of science – observations, precision, logical thinking, clarity of thoughts and expressions qualitative and quantitative decision making are enlarged
- Create an awareness of the impact of chemistry on the environment, society and development outside the scientific community.
- Demonstrate, solve and an understanding of major concepts in all discipline of chemistry
- Gain the knowledge of chemistry through theory and practicals
- Use modern chemical tools Models Charts and equipments
- Understand good laboratory Practices and safety
- Identify chemical formulae and solve numerical problems
- Understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems

Course outcomes of B. Sc. Chemistry

B. Sc. I Semester –I

Students will able to

- Understand periodic Properties.
- Know the periodic classification in S-block, P-block
- Discuss different physical and chemical properties
- Acquaint about reactive intermediate
- Study Aliphatic hydrocarbon and their properties
- Information about aromatic hydrocarbon
- Have a knowledge of Thermodynamics
- Solve numerical problems on thermodynamics
- Understand gaseous state.
- Solve the problem on gaseous state
- Develop new concept of green synthesis
- Develop skill of organic preparation
- Identify acidic and basic radicals from mixtures
- Develop skill of inorganic separation

Course outcomes of B. Sc. Chemistry

B. Sc. I Semester –II

Students will able to

- Have the knowledge of p-block and noble gas elements
- Understand concept of hybridization, type of hybridization, geometry
- Know information regarding gravimetric analysis
- Organic chemistry
- Get the knowledge of alkyl halides
- Understand first, second order reaction their characteristics example
- Study electrical properties for polar and nonpolar molecule
- Know magnetic properties paramagnetic diamagnetic, ferromagnetic and antiferromagnetic
- Analysis of Glucose, a-naphthol, b-naphthol Toludine, Anthracine, Benzoic acid, Salicylic acid
- Measure surface tension, Viscosity, Parachor value, Cleaning power of detergent.
- Determine activation energy of reaction between K2 S2 O8 and KI

Course outcomes of B. Sc. Chemistry

B. Sc. II Semester –III

Students will able to

- Understand the concept of covalent bonding, metallic bonding
- Know frees 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 ,enatomers Diasteromers, Rand 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 KMnO4 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 Werners 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 Lamberts law Beers law, Quantum yield ,Fluorescence, phosphorescence
- Derive expression for rotational spectra, vibrational spectra, band spectra
- Solve numerical on rotational and vibrational spectroscopy

- Know idea for prepartion of complexes like tetrammine Cu(II) sulphate, hexamine Ni(II) chloride, prussian blue, Sodium thiosulphate
- Perform titration and estimation by conductometry, potentiometric, polariometrically

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 aldydes and ketones, aromatic compound
- Understand concept of NMR, Mass spectroscopy and their application in structure determination
- Determination pH of solutionby 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

B. Sc. Botany

Program outcomes

A science graduate with Botany is applicable to many types of carriers.

- Some plant biologists work also works outdoors in forest, hills or fields
- Some of the plant biologists works in museums or in industries
- Botany graduates go into biotechnology, environmental protection and in agriculture
- Botany graduates go into agriculture, environmental sciences and education

Course Outcomes

B. Sc. (Sem I- 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

B. Sc. Zoology

Program outcomes

- Science graduates in zoology are expected to acquire the knowledge of animal science and environment by man
- Understanding the scientific temperament, concepts phenomenon
- Develop scientific attitude
- Develop skills in practical work, experiments and laboratory materials
- Ability to apply scientific methods, problem solving
- Ability to acquire scientific temper and Practical Skills

Course Outcomes

B. Sc. (Sem I - 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

B. Sc. Computer Science

Program outcomes

- Science graduates with computer science able to analyse a problem, construct alternate approaches to its to its solution
- Understand the nature of the software development process
- Understand the programming paradigms and able to learn new programming programs
- Understand the importance and nature of operating system
- Able to communicate effectively
- Understand how information technology affect the society, business

Course Outcomes

B. Sc. (Sem I- 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, program design
- Know the introduction to C, History, feature structure of C program
- 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; Msbox(), 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.

Bachelor of Commerce (Sem-I – Sem-VI)

Program outcomes

- The commerce graduates would able to acquire fundamental knowledge and skills for doing business and commercial activity as per their choice
- Students also acquires the knowledge of accounting, management, business economics, and financial management
- The program enables the students to acquire the retail trading, banking and insurance
- The commerce students become capable of doing a business of their own choice

- The course aims to educate the students with the different factors which effect business.
- The course aims to develop ability to understand and scan business environment as well as process in order to analyses the opportunities and take decisions under the uncertainty
- Grasp the historical development of Co-operatives in India
- Understand and appreciate theoretical development of the co-operative enterprises in India.
- Appreciate role and relevance of co-operatives in the present economics environment.
- Develop understanding and insight in co-operative development
- Provide an insight into the working of Insurance Industry
- Provide insight into the various types of banks and their role in Indian Economy
- The course aims at familiarizing the students with the basic concepts and ground rules of Internet and the various services it offers including designing of website and how to access information from depositories in the world wide web
- The Course is to familiarize the students with the essentials of internet based
- e-commerce and to make them comprehend its practical aspects as well as growth potential of ecommerce in India
- This course exposes the students to the basic concepts and tools used in Management Accounting.
- Provide an understanding of the applications of Management Accounting techniques for management decision making.

- Provide an insight into various growth models and their applicability in present scenario
- Educate the student with the different factors which effect business. This course aims to develop ability to understand business environment as well as process in order to analyses the opportunities and take decisions accordingly
- Understand the structural and functional dynamics of Co-operatives
- Provide insight into the various functions of retail banks and associated procedural aspects
- Acquaint the students with the internet- based e-commerce business models, internet marketing and e-governance.

Course outcomes

B. Com. (Sem-I – 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 programs 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)

Program outcomes

- The post graduate program provide advanced knowledge to students in business and management
- The program enables the students to acquires basic skill for the business activity, accounting practices and research
- After completing the program the post graduate students appear to the NET/SLET examination and can work in the professional field like education
- Students of PG are enable to understand accounting concepts, tools, and techniques used for taking managerial decisions
- Enhance the decision making abilities of students in situation of uncertainty in dynamic business environment, Insurance for Industry and Business Fire & Marine, Insurance for Agriculture Crop &Livestock, Health and Accident

Course outcomes

M. Com. (Sem-I – 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 quide 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.

Program Outcomes for Bachelor of Arts (B. A.)

Students seeking admissions to the programs of Bachelor of Arts are expected to achieve the following goals:

- Realization of ethics and human values
- Basic knowledge with grammar in Marathi and English languages
- Create an awareness among the students about resource and their management in the family
- Responsibility and dutiful citizen of India
- Creativity and ability to stand in the society
- Creating interest in the literatures like Marathi English etc.
- Availing the job opportunities in translation and media
- Students will demonstrate creative thinking, innovation, inquiry also the analysis, evaluation and synthesis of information
- Students will effectively develop, interpret and express ideas through written, oral and visual communication
- Students will demonstrate intercultural competence, knowledge of civic responsibility and the ability to engage effectively in regional, national and global communities.
- The history of philosophy, including knowing the seminal figures, their major doctrines and their methodology
- Able to qualify MPSC, UPSC and other competitive exams.

Course outcomes

B. A. (Sem-I – 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

Course outcomes

B. A. (Sem-I – Sem-VI) – English

Students will 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

Course outcomes

B. A. (Sem-I – 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

Course outcomes

B. A. (Sem-I – 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 Rajya Sabha, 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 sputh Asian Association for Regional Co-Operation (SAARC)
- Study the legislative assembly, Vidhansabha, Vidhan Parishad 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.

Course outcomes

B. A. (Sem-I – Sem-VI) - History

Students will able to learn

- Establishment, and consolidation of Mughal EmpireMughal ruling classes: Ulema; nobility; abd Jamindars.
- Economy:Rural economy ; agricultural production;
- Management of water resources Trade and commerce.
- The village community and peasantry ; Status of women and their rights; Parada, dasi, sati.
- Religion: Sufis, Sant tradition- Sikh, Kabirpanthis, Vaishnava bhakti.
- Advent of European Powers: Portuguese Subsidiary alliance and doctrine of lapse. Economic changes.
- Land revenue statements Social and cultural changesBrahmo Samaj, Arya Samaj and Ramkrishna Mission;Status of women.
- Rise of Gandhiji, Gandhian ideology and movements Satyagrah.
- Non-cooperation, civil disobedience, Quite-India. Revolutionary left-wing movements.
- Subhaschandra Bose and Indian National Army. Communal polities; demand of Pakistan; Partition. Act of Indian Independence