Shri Shivaji Education Society, Amravati's

tma 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

| President Hon'ble Harshvardhan Deshmukh | **Principal** **Dr. G. N. Chaudhari** | **Founder President** **Dr. Panjabrao alias Bhausaheb Deshmukh** **M.A., D. Phil., LL.B., Bar-at-Law** |

2.6.1. Course outcomes of the Programme offered by the institution.

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
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.
- Learns how to solve the integration of the form $\int Pn(x)/\sqrt{Q}dx$,
- To find reduction formulas for $\int sinnxdx$, $\int cosnxdx$, $and\ Walli's\ Formula$, $\int tannxdx$, $\int cotnxdx$, $\int secnxdx$, $\int cosecnxdx$, $\int sinnx\ cosmx\ dx$,
- Know the quadrature, rectification,

B. Sc. I Semester-II Mathematics Paper-III
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
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
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
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 $\tau \, and \, \sigma$ functions, Mobius μ function.
- Define and find the Primitive roots, primitive roots for prime, polynomial congruences, the congruence $x^2 \equiv a \left(\mathrm{mod} \, p \right))$, general quadratic congruence, quadratic residues.

B. Sc. II Semester-IV Mathematics Paper-VII
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
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
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
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
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, sub modules, quotient modules, homomorphism and isomorphism theorems.

B. Sc. III Semester-V Mathematics Paper-XII
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 Programme: B.Sc. PHYSICS
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, Raynold's number, study property of matter, surface tension.
- Understand above concepts through experiments in laboratory.
- Develop numerical solving technique in students

B. Sc. I Semester-II
Students will able to

- Have a knowledge about the kinetic theory of gases.
- Understand Brownian motion, Avagadro'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.

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.

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 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

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

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

Course outcomes of B. Sc. Electronics
B. Sc. I Semester –I and II
Students will able to

- Identify the measuring instruments, semiconductor diode, bipolar transistors, switching and optoelectronic devices and integrated circuits
- Understand the binary arithmetic and logic gates, Boolean algebra
- Understanding the multivibrators and Flip Flops, counters and shift registers, combinational logic circuit and semiconductor memories

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

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

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

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 $K_2S_2O_8$ and KI

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

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 $KMnO_4$ colorometrically and also copper
- Determination of equivalent weight of organic acid

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

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

Course Outcomes B. Sc. Botany

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

Course Outcomes B. Sc. Zoology

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

Course Outcomes of B. Sc. Computer Science

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, 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; 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

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

Course Outcomes (M. Sc. Computer Science)

M. Sc. I Semester-I and II

Students will able to

- Study the digital systems and microprocessor, Boolean algebra, Logic families, design of arithmetic circuit
- Understanding the construction and working of Flip Flops, evaluation of microprocessor, 8086 microprocessor
- Have the knowledge of stack structure, interfacing of display
- Understanding .net technology, languages, benefits, C# and .net
- Understanding the access modifiers, constructor, destructors, nesting of classes
- Study the operator overloading , console I/O operations
- Understanding the multithreading in C#, data access with .net
- Study the operating system, process management, process synchronization and deadlocks
- Understand the memory management, file system, protection, access control and permissions, distributed file system
- Have the knowledge about the digital communication, data transmission, serial, media, modulation, multiplexing and network reference model
- Have the knowledge about HTTP, FTS, FTP, DNS

- Understanding the transport layer services and principles, network layer, data link layer and network security and management
- Understanding the Java programming, Java and WWW, objects and classes
- Know the creating and importing packages, applet life cycle and tag, user interface
- Understanding the data structures, arrays, linked list, stacks, queues
- Understanding the concept of Trees, searching and sorting, graphs and indexing
- Know the system concept, introduction to software engineering, software process framework, software engineering practice
- Understanding the Requirements engineering and requirement modelling approaches
- Getting the knowledge of software design, designing traditional components
- Understanding the software quality, software metrics and software testing
- Have the knowledge about the compiler construction , scanning and parsing , memory allocation, compilation of control structures,
- Understanding the error detection, indication and recovery, compilation of I/O statements, code optimisation

Course Outcomes (M. Sc. Computer Science)

M. Sc. I Semester-III and IV

Students will 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

Course outcomes M. Sc. Chemistry Semester –I

Students will able to

- Know the stereochemistry and bonding in main group elements and molecular orbital representation of polyatomic molecules with special reference to CH_4, NH_3, H_2o, PF_5, SF_6, B_2H_6, and CO_2
- Understanding metal-ligand bonding, molecular orbital theory of coordination compounds
- Know the classification, nomenclature, structure, bonding and topology of boranes, occurrence of metal-metal bonds, binuclear, trinuclear, tetranuclear and octahedral clusters, macrocyclic complexes, types and synthesis by coordination template effect
- Know the non-aqueous solvent behaviour, solvent system concept, metal-ligand equilibria in solution, symmetry and group theory
- Have a knowledge about the nature and bonding in organic molecule, stereochemistry, configuration and conformational stereoisomers
- Understanding the reaction mechanism, structure and reactivity
- Know the aliphatic nucleophilic substitution, SN1, SN2, mixed NS1, NS2 and SET and SET and SNi mechanism
- Understanding the elimination reaction, E1, E2 and E1 CB mechanisms orientation of the double bond
- Know the summery of factors controlling substitution of elimination by unimolecular and biomolecular mechanisms
- Understanding the aromatic electrophilic substitution and aromatic nucleophilic substitution
- Know the quantum chemistry, surface chemistry, thermodynamics and non equilibrium thermodynamics
- Understanding the nuclear chemistry, general characteristics of radio active decay
- Know the Fission energy natural Ur reactor, classification of reactor, recovery of Ur and plutonium nuclear waste management
- Have the knowledge about chemical dynamics containing collision theory, energy requirement and steric requirement, unimolecular reaction
- Have the knowledge about basic concept of analytical chemistry, statistical chemistry

- Understanding the separation technique, ion exchange separation
- Know the gas chromatography, high performance liquid chromatography HPLC
- Understanding the chemical safety and handling chemicals, explosives and chemical weapons

Understanding the qualitative organic analysis and quantitative analysis in **Course outcomes**
- laboratory

M. Sc. Chemistry Semester –II Course outcomes

Students will able to
- Understand electronic spectra of transition metal complexes, magnetochemistry
- Know the reaction mechanism of transition metal complexes I and II
- Have the knowledge about metal carbonyls, structure and bonding, metal nitrosyls, fluxional organometallic compounds
- Understanding the bioorganic chemistry of F_e and C_o, vitamin-B_{12} , its structure and biochemical function and mechanisms of action
- Know the mechanistic and stereo chemical aspects of addition reaction involving electrophilic and free radical molecule rearrangement
- Understand the radical anion and radical cations, types, free radical substitution mechanism at an aromatic substrate
- Know about the photochemistry , pericyclic reaction
- Have the knowledge about green chemistry, its design
- Understand the chemical dynamics contains kinetics of complex reactions, chain reaction, general features of fast reaction, nuclear magnetic resonance method
- Know about the quantum chemistry, hybrid orbitals sp, sp2, sp3
- Have the knowledge about macromolecules, electrochemistry and statistical thermodynamics
- Have the knowledge about the optical methods and environmental chemistry
- Understanding the flame emission and atomic spectrometry
- Have the knowledge about the water pollution and air pollution, soil pollution and pesticide analysis

Course outcomes M. Sc. Chemistry Semester –III

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_{12} , B_1 B_6 etc and natural pigments

Course outcomes M. Sc. Chemistry Semester –IV

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}H NMR, ^{13}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 photoflurescence 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

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 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

Course outcomes Master of Commerce (Sem-I – Sem-IV)

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

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) - 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

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) – 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, Immanual Kant
- Know the concept of purushartha ie Dharma, Artha, Kaam and Moksha, ehics 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, Immanual Kant, the concept of God

Course outcomes Master of Arts (M. A. - Marathi)

M. A. (Sem-I – 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 Varkari sampraday, Uday, social status, reasons, social work of sant Dnyaneshwar and Namdevanchi mandiyali
- Shivakal and peshvai Kal
- Loksahitya, Lokgeete, Loknatya, Lokkatha types
- Understanding the thoughts of society reformers like, Mahadev Govind Ranade, 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

Master of Arts (M. A.-Economics)
M. A. (Sem-I – Sem-IV) – Economics
Students will 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

Master of Arts (M. A.-Political Science)

- The programme offers a comprehensive and up to date review in a field of Political science
- Programmes covers comparative politics, international relations, political theory
- The programme develop ability to use criticise, analyse and reflective thoughts
- Students increases their confidence in the dissemination of research output
- Students communicate effectively by oral, written and technological means
- Students works responsibly and creatively as an individual or as a leader of team and in multidisciplinary environment
- Understand and follow the changes in a political behaviour, ideas and structures

Course outcomes
M. A. (Sem-I – Sem-II) - Political Science

Students will able to

- Know the political thoughts of Raja Ram Mohan Roy, Mahatma Gandhi, Dr Babasaheb Ambedkar, Jawaharlal Nehru, Dr Panjabrao Deshmukh, Mahatma Jyotiba Fule, Vinayak damodar Sawarkar, M N Roy, Ramsami Periyar, and Rashtrasant Tukadoji Maharaj in modern India
- Have the knowledge about Indian government and politics in which the background of the constituency is studied
- Understand the fundamental rights and constitutional amendments
- Understand the composition and Juridiction of Supreme court
- Have acquainted the knowledge about electoral process
- Know the issues in politics like caste, religion, regionalism and language, critical assessment with success and failures
- Understand the public administration, major approaches band methods of public administration, organization and its basic problems, principles of organization and Bureaucracy
- Understand the budgeting, administrative accountability, personal administration, public administration in the age of globalization and liberalization and governance
- Know the international relations, theories of international relations, concept and management of national power, diplomacy
- Understand the meaning, merits and demerits of Disarmament and arms control and concept of non alignment
- Study the major issues in contemporary world politics, end of cold war world, gender issue, globalization, environmental issue, terrorism, human rights

Course outcomes
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

Course outcomes
M. A. English (Sem-I – Sem-II)
Students will able to

- Appreciate the history of English language theoretical approaches
- The course contains poetry from various culture, languages and historic periods
- Understand the significance of Elizabethan literature and the writers belonged and its impact on the history works produced world over
- Appreciate poetry as literary art
- Identify a variety of forms genres of poetry from diverse cultures and historic periods like sonnet, ballad, dramatic monologues, epic and pastoral, free verse, elegy etc
- Recognize rhythms, metrics and other musical aspects of poetry
- Recognize and Analyze the grammatical system of English and other language
- Compare and contrast languages in terms of systematic differences in phonetics, phonology, morphology, syntax, semantics and pragmatics
- Have the knowledge about the origin and development of English drama and its various forms of different stages and ages
- Know how writer use the resources language as a creativity to explore the human experience through drama
- Have the knowledge about history of English language and enlighten the students with evolution of English language

- Develops reading habit gaining an insight into the socio-cultural and political diversities
- Enhance the aesthetic and critical quality by approaching world fiction in general
- Understand the cultural legacy of colonialism and imperialism
- Realize how language has become a site for both colonization and resistance
- Compare and contrast the indigenous literature and culture with other literatures and cultures
- Have the knowledge of contemporary issues in language policy and ability to take a public and professional role in these issue

Course outcomes
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

Doctor of Philosophy in the Faculty of Humanities
Course outcomes

Doctor of Philosophy Ph. D. (Marathi)
Researcher will able to

- 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

- 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

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

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

Course outcomes
Doctor of Philosophy Ph. D. (Chemistry)

Researcher will able to

- 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.

- 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.

Course outcomes
Doctor of Philosophy Ph. D. (Botany)

Researcher will able to

- 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

- 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

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

- 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

- 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

Course outcomes
Doctor of Philosophy Ph. D. (Mathematics)

Researcher will able to

- 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

- 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.

Course outcomes
Doctor of Philosophy Ph. D. (Zoology)

Researcher will able to

- To initiate research in classical and modern aspects of life intricacies besides exploration , prevention and conservation of the local biological recourses.
- 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

- 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: