

Dharampeth M.P. Deo Memorial Science College, Nagpur

Program outcomes, program specific outcomes and course outcomes

Department of Chemistry 2018-19

Program outcome B.Sc. Chemistry

Department of Chemistry	Successfully completion of three year degree program in Chemistry a student should be able to know:
Program Outcome	<p>PO-1. To exhibit, solve and an understanding of major concepts in all disciplines of chemistry.</p> <p>PO-2. To think methodology and solve the problem.</p> <p>PO-3. To provide work for critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.</p> <p>PO-4. Create an awareness of the impact of chemistry on the environment, society and development outside the scientific community.</p> <p>PO-5. Find out the non conventional route for chemical reaction for sustainable and eco friendly development.</p> <p>PO-6. To repeat the scientific nature in the students and outside the scientific community and also independently and illustrate a logical conclusion.</p> <p>PO-7. Use modern techniques, well standard equipments and Chemistry software.</p>
Program Specific Outcome	<p>PSO-1. Gain the knowledge of Chemistry through theory and practical.</p> <p>PSO-2. Identify chemical formulae and solve numerical problems.</p> <p>PSO-3. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.</p> <p>PSO-4. Use modern chemical tools, Models, Chem-draw, Cheme- sketch software, Charts and Equipments.</p> <p>PSO-5. Know the (SAR) structure-activity relationship.</p> <p>PSO-6. Understand good laboratory practices and safety.</p> <p>PSO-7. Develop research oriented skills.</p> <p>PSO-8. make aware and handle the sophisticated instruments</p>

Course Outcome of B.Sc. Chemistry

Course	<p>Outcome</p> <p>After completion of these courses students should be able to;</p>
CH-101 Inorganic Chemistry Sem-I	<p>CO-1. To understand the de-brogils waves equation.</p> <p>CO-2. Derive Schrodinger's time dependent and independent equation</p> <p>CO-3. Study the structure of atom, Hunds rule, paulis principal, calculation of microstate and selection rule.</p> <p>CO-4. Understand De-Broglie hypothesis and Uncertainty principle</p> <p>CO-5. To study the periodic properties and s-block and p-block elements.</p>
CH-102 Physical Chemistry Sem-I	<p>CO-1. Learn the thermodynamic description of exact, inexact differential and state function.</p> <p>CO-2. Know the statistical thermodynamics and various partition functions and thermochemistry.</p> <p>CO-3 To study the boyls law charls law and Daltons law.</p> <p>CO-2. Know the qualitative properties of liquid such as surface tension, viscosity and Refractive index.</p> <p>CO-4. Study the steady state approximation adsorption isotherm, BET equation, michaelis-mentens equation.</p> <p>CO-5 To study the catalysis homogeneous and heterogeneous catalyst.</p>
CH-103 Lab- course Sem-I	<p>CO-1 To perform the semi micro qualitative analysis of inorganic mixture</p> <p>CO-2 To calculate the surface tension, viscosity, refractive index by using Ostwald viscometer, stalaganometer and abbes refractometer.</p>

CH-201 Organic Chemistry Sem-II	CO-1. Study of structure bonding and mechanism of organic reaction. CO-2. Learn the stereochemistry of organic compounds. CO-3. Determine geometrical isomerism and stereochemistry. CO-4. To study the alkanes alkenes and aromatic compound.
CH-202 Physical Chemistry Sem-II	CO-1. Learn the thermodynamic description of exact, inexact differential and state function. CO-2. Know the statistical thermodynamics and various partition functions. CO-3. Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure. CO-4. Study the rate of reaction and chemical kinetics.
CH-203 LAB-course Sem-II	CO-1 To perform the qualitative analysis of organic mixture. CO-2 To perform the three component phase diagram, distribution coefficient.
CH-301 Inorganic Chemistry Sem-III	CO-1 Determine and Learn about Molecular orbital Theory and VSEPR Theory. CO-3. To study the d-block elements. CO-2. To study the errors in chemical analysis. CO-4. To study the Lanthanides and actinides.
CH-302 Organic Chemistry Sem-III	CO-1 To study the orientation aryl halides and alkyl halides. CO-2 To study the preparation properties and chemical reaction of alcohols and phenols. CO-3 To study the aldehydes and ketone and its reaction. CO-4 To learn about carboxylic acid and its mechanism.
CH-303 LAB- Course Sem-III	CO-1 To perform the practicals of volumetric analysis. CO-2 To study the complete analysis of organic compounds.
CH-401 Inorganic Chemistry Sem-IV	CO-1 To study the co-ordination compounds and isomerism. CO-2 To study the oxidation reduction. CO-3 To study the colorimetry and its techniques. CO-4 To study the chromatography separation technique and inorganic polymer.
CH-402 Physical Chemistry Sem-IV	CO-1 To study the structure of solid in solid state CO-2 To study the electrochemistry and various laws. CO-3 Understanding the term spectroscopy such as rotational and vibrational spectroscopy.
CH-403 LAB-course Sem-IV	CO-1 Preparation of co-ordination complexes and separation technique. CO-2 To perform the conductometry law.
CH-501 Organic Chemistry Sem-V	CO-1 Understanding the nitrogen containing organic compound and its reaction CO-2 To learn about heterocyclic compound. CO-3 To study the organometallic compounds. CO-4 Understanding the UV spectroscopy.
CH-502 Physical Chemistry Sem-V	CO-1 To study the quantum chemistry, to elaborate the de Broglie's hypothesis and Heisenberg's law. CO-2 Investigate the magnetic behavior of the compound. CO-3 To study the Raman spectroscopy. CO-4 Categorize the photochemistry and its law.
CH-503 Lab-course Sem-V	CO-1 To estimation of various natural products. CO-2 To verify the Lambert Beer's law by using various inorganic compounds.
CH-601 Inorganic Chemistry Sem-VI	CO-1 To study the carbonyl compound. CO-2 To be taught Jahn-Teller effect. CO-3 To be categorized thermodynamics and kinetic aspects. CO-4 To establish the various inorganic polymer
CH-602 Organic Chemistry	CO-1 Understand the NMR instruments such as COSY, HECTOR. CO-2 To classify various carbohydrates. CO-3 To study amino acids and various proteins.

Sem-VI	CO-4 To study various dyes, drugs, oils, fats and detergent.
CH-603 Lab-course Sem-VI	CO-1 Preparation various complex by VBT Theory CO-2 Separation and analysis of binary mixture containing organic compounds.

Course outcomes of B.Sc. Physics - First Year (SEM -I and SEM -II)
Department of Physics

Course	Outcomes
After completion of these courses students should be able to;	PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics. PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments. PO-4. Create an awareness of the impact of Physics on the society, and development outside the scientific community. PO-5. PO-6. To inculcate the scientific temperament in the students and outside the scientific community. PO-7. Use modern techniques, decent equipments and Phonics software"s
Semester - I Paper I (101) (Properties of Matter and Mechanics)	
Unit I (Elasticity)	CO-1. Know Elastic and Plastic properties of material CO-2. To study relationship between Y , η and K CO-3. To determine Young's Modulus of Cantilever CO-4. To study Torsional Pendulum and Maxwell Needle
Unit II (Viscosity)	CO-1. To streamline and turbulent flow of liquid CO-2. To know coefficient of viscosity CO-3. To study Bernoulli's theorem and its applications CO-4. To know Poiseuilli's formula
Unit III (Surface Tension)	CO-1. To know about surface tension property of water CO-2. To understand capillary rise phenomenon CO-3. To know surface energy by Jaeger's method
Unit IV (Mechanics)	CO-1. To understand Newton's Laws of motion CO-2. To gain the knowledge of motion in central force field CO-3. To classify elastic and inelastic scattering CO-4. To know the center of mass system
Paper II (102) (Electrostatics, Time Varying fields and Electric Current)	
Unit I (Electrostatics)	CO-1. To study Coulombs law in vacuum in vector form, CO-2. To understand terms electric field intensity, electric potential, electric field intensity CO-3. To study electric dipole and its property CO-4. To understand conservative nature of electric field
Unit II (Dielectric)	CO-1. To know what is dielectric material CO-2. To know difference between polar and non-polar molecule CO-3. To study Claussius-Mossitti equation CO-4. To study capacitance property of capacitor
Unit III (Time Varying Fields)	CO-1. To understand Faradays law of electromagnetic induction CO-2. To study working and application of transformer

Unit IV (Electric current)	CO-1. To use complex number in studying a. c. current CO-2. To study LR, CR, LCR circuit using j-operator method
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Semester - II

Course	Outcomes
After completion of these courses students should be able to;	
Paper I (201) (Oscillations, Kinetic theory of gases and Thermodynamics)	
Unit I (Free oscillations and Damped Oscillations)	CO-1. To get acquainted with linear and angular S.H.M. CO-2. To write and solve differential equation for S.H.M. CO-3. Study Lissajous's figure
Unit II (Forced oscillation and Kinetic Theory of Gases)	CO-1. They study forced oscillation with one degree of freedom CO-2. Study differential equation of forced oscillation CO-3. Understand resonance phenomenon
Unit III (Transport Phenomenon in gases)	CO-1. They know how transportation takes place in gases CO-2. Understand Van der wall's equation CO-3. Study Carnot's cycle
Unit IV (Thermodynamics)	CO-1. Understand what is entropy CO-2. Study laws of thermodynamics CO-3. Know Maxwell's equation and its application
Paper II (202) (Gravitation, Astrophysics, Magnetism, Magnetostatics)	
Unit I (Gravitation)	CO-1. Know Kepler's law of Planetary motion CO-2. Understand Newton's law of gravitation CO-3. Study Gravitational field and Gravitational potential CO-4. They know about gravitational self energy
Unit II (Astrophysics)	CO-1. They are introduced to solar system CO-2. To measure distance of planet CO-3. Measure mass of sun and planet CO-4. Know concepts of cosmological theories
Unit III (Magnetism)	CO-1. They gain knowledge on magnetic properties of material CO-2. Study diamagnetic, paramagnetic and ferromagnetic properties CO-3. Study ferrites and superconductors
Unit IV (Magnetostatics)	CO-1. Study concept of magnetic field, Lorentz force equation, CO-2. They know magnetic dipole moment, angular momentum and gyro magnetic ratio, CO-3. Understand Biot- Saverts law and it's applications CO-4. They study Amperes law and it's applications
Semester III Paper I- Sound Waves, Applied Acoustics, Ultrasonic and Power Supply	
Waves in Media	CO-1.They understand waves, group velocity, phase velocity, their relation, standing waves, harmonics, quality of sound, CO-2.Know about human ear construction and its response, limit of human audibility, intensity and loudness of sound, musical instruments and musical scale
Applied Acoustics	CO-1.Understand transducers and their characteristics, recording and reproduction of sound. CO-2.Understand acoustic of building, reverberation Sabine's formula, factors affecting acoustics of building and requirement of good acoustics.

Ultrasonics	CO-1.Understand ultrasonic waves, production and their properties, piezoelectric effect and generator. CO-2.Understand magnetostriction effect and oscillators, applications of ultrasonic waves.
Power Supply	CO-1.Understand half wave and full wave bridge rectifiers, filters CO-2.Understand difference between regulated and unregulated power supply, line and load regulation, voltage stabilization, working of zener diode as voltage regulator, IC regulator and voltage regulation.
Paper II-Physical Optics and Electromagnetic Waves	
Interference of Light	CO-1.Understand phenomenon of interference of light, Newton's ring arrangement and its applications. CO-2.Understand Michelson's interferometer, Fabry- Parrot interferometer and its applications.
Diffraction of Light	CO-1.Understand phenomenon of diffraction of light, Fresnel and Fraunhofer diffraction. CO-2.Understand zone plate, plane diffraction grating and its applications CO-3.Understand Rayleigh's criteria of resolution and resolving power of grating
Polarization	CO-1.Introduction to polarization phenomenon, to understand Brewster's law, scattering of light and blue colour of sky. CO-2.Understand uniaxial and biaxial crystals, positive and negative crystals, ordinary and extra ordinary rays. CO-3.Understand Nicol prism, its construction and application. CO-4.Understand double refraction, construction of half and quarter wave plate
Electromagnetic waves	CO-1.Introduction to electromagnetic spectrum, CO-2. Understand origin and characteristics of EM waves. Physical significance of Maxwell's equations, EM wave equations in free space and conducting medium, to understand Poynting theorem and Poynting vector.
Semester IV	
Paper I-Solid State Physics, X-ray and Laser	
Solid State Physics	CO-1.Introduction to crystal structure, periodicity, lattices, and its types and basis lattice planes CO-2. Understand fundamental translation vector, unit cell and primitive cell, Miller indices, CO-3. Understand Bravais lattices, packing fraction, coordination number, inter planar distances. CO-4. To understand crystal structure of NaCl, diamond, CsCl and ZnS.
X-Ray	CO-1.Introduction to X-rays, students understand discrete and continuous X-ray spectra and its main features, characteristics of X-ray spectra CO-2. Understand Duane- Hunt law, X-ray emission spectra, Mosley law and its importance and applications. CO-3. Students also understand Auger effect, X-ray absorption spectra and applications of X-rays in different fields.
Solid State Physics	CO-1. Students understand reciprocal lattice, Wigner-Sietz cell, geometrical relation between direct and reciprocal lattice. CO-2. Understand Lau's theory of X-ray diffraction, Bragg's law and Bragg's diffraction conditions for direct and reciprocal lattice, Laue's pattern CO-3. Students understand Bragg's spectrometer and it's applications
Laser	CO-1.Students are introduced to Laser, Einstein's relation, absorption, spontaneous and stimulated emission CO-2. They understand population inversion, optical pumping, characteristics of laser beam, three level, four level laser system. CO-3. Understand Ruby laser, He-Ne laser, semiconductor laser and applications of lasers.
Paper II-Solid State Electronics and Molecular Physics	
Solid State Electronics	CO-1. Students are introduced to light emitting diode, solar cell, photovoltaic cell

	CO-2. They understand construction, working and characteristics of transistor in common emitter and common base mode. CO-3. Understand graphical analysis in CE mode, hybrid parameters, equivalent circuit at low frequency in CE mode, thermal runaway, stabilization, heat sink, stability factor and bias stabilizing circuits.
Field Effect Transistor	CO-1. Students understand construction and working principle of JFET, difference between BJT and JFET, characteristics of JFET, it's parameters, and use of JFET as an amplifier and advantages of JFET over BJT. CO-2. Students are introduced to MOSFET, it's types, construction and working. Characteristics of MOSFET and special features of MOSFET.
Molecular Physics	CO-1. Students understand quantization of vibrational and rotational energies, types of molecules based on inertia, rigid diatomic molecules, intensity distribution in rotational levels. CO-2. Understand diatomic molecules as harmonic oscillator, rotational-vibrational spectra and Born-Oppenheimer approximation.
Raman Spectroscopy	CO-1. Students are introduced to Raman effect, classical and quantum explanation, its experimental set-up. CO-2. Understand Raman spectra and molecular structure, applications of Raman effect, electronic spectra, dissociation energy, Frank-Condon principle. CO-3. Students are introduced to elementary ideas of NMR and ESR and their applications in spectroscopy.
Semester V Paper I- Atomic Physics, Free Electron Theory	
Atomic Physics	1) Revise Bohr's model, Somerfield model and Chadwick model to study structure of atom 2) Understand Vector atom model 3) Understand spinning of electron, Selection rules and Coupling 4) Understand and Differentiate between Normal and Anomalous Zeeman Effect 5) Understand Stark effect
Free Electron Theory	1) Understand electrical and thermal conductivity 2) Understand Fermi energy and Fermi temperature 3) Understand band theory of solids 4) Understand the concept of hole 5) Study of Hall effect 6) Differentiate between conductor, semiconductor and insulator
Statistical Physics	1) Understand μ space and gamma space 2) Understand Boltzmann's entropy relation 3) Differentiate between accessible and inaccessible estates 4) Differentiate between macro and micro states 5) Understand and apply Maxwell distribution law to molecular speed
Statistical Physics	1) Distinct between mean, r.m.s. and most probable values 2) Understand and apply Bose-Einstein statistics to black body radiation 3) Estimate temperature of sun 4) Understand and apply Fermi-Dirac Distribution to free electrons in metal 5) Compare between M-B, B-E and F-D statistics
Paper II-Quantum Mechanics, Nanomaterials, Nanotechnology	
Quantum Mechanics	1) Explain failure of Classical Mechanics 2) Understand development of Quantum Mechanics 3) Understand and explain particle duality
Quantum Mechanics	1) Understand concept of wave packet and uncertainty principle 2) Understand Schrodinger equation, wave function and operators Apply the concept of Schrodinger equation, wave function and operators to free particle in one and three dimension
Nanomaterials	1) Understand difference between bulk material and nonmaterial 2) Understand 0D, 1D, 2D and 3D dimensions of nanomaterial 3) Understand bottom up and top down approaches of synthesis of nonmaterial

	4) Understand physical and chemical properties of nanomaterial
Nanotechnology	1) Understand and apply methods of synthesis of nanomaterial 2) Determine size of nanoparticles 3) Understand to characterize nonmaterial by SEM and TEM 4) Apply nonmaterial in various field
Semester VI Paper I-Relativity, Nuclear Physics and BioPhysics	
Relativity	1) Understand frame of reference 2) Understand and differentiate between inertial and non inertial frames 3) Understand Galilean and Lorentz transformation 4) Explain postulates of special theory of relativity 5) Study Velocity addition theorem 6) Understand Mass –Energy relation
Nuclear Physics	1) Understand accelerator and its types 2) Understand discovery of neutron 3) Explain Liquid drop model 4) Understand chain reaction and Nuclear reactors
Nuclear Physics	1) Understand and differentiate between Nuclear fission and fusion 2) Understand and differentiate between α , β and γ decay 3) Understand tunneling
Bio Physics and BioInstruments	1) Understand principles of ECG, EEG, ERG, EMG and Sonography and their application 2) Understand basic principles of colorimeters, spectrophotometer, pH meter and their application
Paper II-Electronics, Fiber Optics, Communication and Digital Electronics	
Amplifiers	1) Understand and classify amplifiers 2) Understand Op-amp and its application 3) Understand Oscillators, its types and applications 4) Differentiate between amplifiers an Oscillators
Fiber Optics	1) Understand principle of optical fiber 2) Differentiate between types of optical fiber 3) Understand losses of Optical fiber 4) Understand applications of Optical fiber
Communication	1) Understand communication and modulation 2) Understand and differentiate between amplitude and frequency modulation 3) Understand advantages and disadvantages of amplitude and frequency modulation
Number Systems	1) Understand Unitary system 2) Understand basic logic gates 3) Apply logic gates 4) Verify truth table 5) Verify De-Morgan's Theorem

Department of Statistics
Course outcome, Programme Outcomes and Programme specific Outcomes: B. Sc Statistics

Department of Statistics	After successful completion of three year degree program in Statistics a student should be able to;
Programme Outcomes	PO-1. Demonstrate, solve and understanding of major concepts in all disciplines of statistics PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of statistical experiments. PO-4. Create an awareness of the impact of statistics on the society, and development outside the scientific community. PO-7. Use modern techniques and different Statistical software's
Programme Specific Outcomes	PO-1. Make aware and handle the sophisticated data. PO-2. Gain the knowledge of Statistics through theory and practical's. PO-3. To fit various discrete and continuous probability distributions and to study various real life situations. PO-3. To test the hypotheses particularly about mean, variance, correlation, proportions, goodness of fit. PSO-4. Understand the testing of hypothesis. To study applications of statistics in the field of economics, demography etc. PSO-5. Use modern statistical tools, Models, Charts and Equipments. PSO-6. Develop research oriented skills.

Course Outcomes B. Sc Statistics Semester-I	
Course	Outcomes After completion of these courses students should be able to;
ST-311: Probability Theory	CO-1. Distinguish between random and non-random experiments. CO-2. Find the probabilities of events. CO-3. Obtain a probability distribution of random variable (one or two dimensional) in the given situation. CO-4. Apply standard discrete probability distribution to different situations.
ST-312: Descriptive Statistics-I	CO-1. Tabulate statistical information given in descriptive form. CO-2. Use graphical techniques and interpret. CO-3. compute various measures of central tendency, dispersion, skewness and kurtosis CO-4. compute the correlation coefficient for bivariate data and interpret it CO-5. Analyze data pertaining to attributes and to interpret the results. CO-6. Summarize and analyze the data using computer. CO-7. Apply statistics in the various fields.

Course Outcomes B. Sc Statistics Semester-II	
ST-321: Probability distribution	CO-1. Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions. CO-2. Define binomial outcomes and compute probability of getting X successes in N trials. CO-3. Identify the characteristics of different discrete and continuous distributions. CO-4. Identify the type of statistical situation to which different distributions can be applied. CO-5. Use Poisson, exponential distributions to solve statistical problems. CO-6. Use the normal probability distribution including standard normal curve calculations of appropriate areas. CO-7. Use different distributions to solve simple practical problems.
ST-322: Descriptive Statistics-II	CO-1. Explain the characteristics of the mean, mode, and median. CO-2. Calculate the mean, mode and median for both grouped and ungrouped data. CO-3. Define the range, mean deviation, variance, and the standard deviation. CO-4. Explain the characteristics of the range, mean deviation, variance, and the standard deviation. CO-5. Calculate the range, mean deviation, variance, and the standard deviation for grouped and ungrouped data. CO-6. Understand regression analysis CO-7. Be able to compute and interpret the results of Bivariate Regression CO-8. Be able to compute and interpret Correlation Analysis.

Semester-III	
Course	Outcomes
	After completion of these courses students should be able to;
ST-201:Paper- Statistical Methods	CO-1. Drawing random samples from uniform and normal distribution CO-2. Able to find moments and correlation coefficient of bivariate probability distribution CO-3. Obtain a joint probability distribution of random variable (one or two dimensional) in the given situation. CO-4. Distinguish between t- distribution and F- distribution CO-5. Identify the type of Statistical situation in which different Transformation of variable technique can be applied
ST-202: Economics Statistics	CO-1. Construction of Price and Quantity index number by simple aggregative method CO-2. Construction and uses of Wholesale Price Index number. CO-3. Able to determine concept of purchasing power of money CO-4. Fitting of Pareto curve to income data. CO-5. Analyze data pertaining to seasonal Indices and to interpret the results. CO-6. summarize and analyze the data using Economic time series. CO-7. Apply statistics in the various fields.

Semester-IV

ST-211: Statistical Inference	CO-1.To solve problems on chi-square for testing independence of attributes. CO-2. To solve problems on t-tests and construction of confidence intervals for single mean and difference of two means, paired t-test. CO-3. Identify the characteristics properties of good estimator. CO-4. Identify the type of statistical situation to which central limit theorem can be applied. CO-5 Understand the construction of confidence interval.
ST-212: Applied Statistics	CO-1. Explain the sources of demographic data . CO-2. Calculation of Percentile scores and T-scores for a given frequency distribution of raw scores. CO-3. Comparison of raw scores on the basis of (i) Percentile, (ii) Z scaling, (iii) T scaling. CO-4.Able to solve numerical problems on construction and use of life tables. CO-5. Can do computation of CDR and Standardized death rates by direct and indirect methods. CO-6. Be able to compute and interpret Gross Domestic rates.

Course Outcomes Semester-V	
Course Outcomes	After completion of these courses students should be able to;
ST-501 : Statistical quality control and linear programming problem	CO 1 Introduction of statistical quality control (SQC) CO 2 Understand the role of statistical tools in quality improvement CO 3 Understand the different types of variability and how control chart is used to detect assignable and chance causes of variation. CO 4 Use 3σ control limit to indicate whether the production process is in control or not. CO 5 Construct and interpret control charts of variables such as \bar{X} , R and s -charts CO 6 Construct and interpret control charts of attribute such as p and u-charts CO 7 Understand the role of acceptance sampling (AS) in modern quality control systems. The advantages and disadvantages of AS. CO 8 Know how single and double-sampling plans are used. Know how to determine the operating characteristic (OC) curve. CO 9 Learn how to develop linear programming models for simple problems. Be able to identify the special features of a model that make it a linear programming model. CO 10 Learn how to solve two variable LP models by the graphical solution procedure. Understand the importance of extreme points in obtaining the optimal solution. CO 11 Know the use and interpretation of slack and surplus variables. Understand how alternative optimal solutions, infeasibility and unboundedness can occur in LPP.
ST-502: survey sampling techniques	CO 1 .understand the importance of sampling and how results from samples can be used to provide estimates of population characteristics such as the population mean the population standard deviation and / or the population proportion. CO 2 Know what simple random sampling is and how simple random samples are selected. CO 3 Specifically know the characteristics of the sampling distribution of the sample mean and the sampling distribution of the sample proportion. CO 4 Learn about a variety of sampling methods including stratified random sampling, cluster sampling, systematic sampling. CO 5 Comparison of SRSWOR with stratified, cluster and systematic sampling respectively.

Course Outcomes Semester-VI	
Course Outcomes	After completion of these courses students should be able to;
ST-601: Operations Research	CO 1 Formulation and construction of network diagram. CO 2 Understand the concept of optimization problems, theory of duality. CO 3 Describe the nature and formulation of transportation, and assignable problems. CO 4 Solve maximization problem using transportation and assignable model, CO 5 Theorems related to solution of an assignable problems. CO 6 Understand basic concepts of game theory and methods of solving game problems
ST-602: Experimental Designs	CO 1 Definition and general principle of designs of experiments. CO 2 Calculations of main effects and interaction effects using factorial experiments. CO 3 Calculate and interpret a χ^2 -test for a contingency table CO 4 Understand the concept of analysis of variance (ANOVA) CO 5 Interpret and ANOVA table

Course Outcomes Semester-V	
Course Outcomes	After completion of these courses students should be able to;
1. ST-311: Statistical quality control and linear programming problem	2. CO-1. Understand the statistical concepts underpinning Statistical Process control. 3. CO-2 Able to conduct process capability studies and apply control charts in workplace. 4. CO-3 Interpret the output of statistical process control methods effectively, avoiding misconceptions and identifying opportunities and identifying opportunities for process improvement. 5. CO-4 The effects of variation on processes and be able to use that understanding to make sound decisions. 6. CO-5 Understand the role of acceptance sampling (AS) in modern quality control systems. The advantages and disadvantages of AS. 7. CO-6 Know the 3 major types of AS procedures. Know how single and double-sampling plans are used. Know how to determine the operating characteristic (OC) curve. 8. CO-7 Understand the effects and sampling plan parameters on sampling plan performance, 9. CO-8. Learn how to develop linear programming models for simple problems. Be able to identify the special features of a model that make it a linear programming model. 10. CO-9 Learn how to solve two variable LP models by the graphical solution procedure. Understand the importance of extreme points in obtaining the optimal solution. 11. CO-10. Know the use and interpretation of slack and surplus variables. Understand how alternative optimal solutions, infeasibility and unboundedness can occur in LPP.
ST-312: survey sampling techniques	CO-1. understand the importance of sampling and how results from samples can be used to provide estimates of population characteristics such as the

	<p>population mean the population standard deviation and / or the population proportion.</p> <p>CO-2. Know what simple random sampling is and how simple random samples are selected.</p> <p>CO-3. specifically know the characteristics of the sampling distribution of the sample mean and the sampling distribution of the sample proportion.</p> <p>CO-4. Learn about a variety of sampling methods including stratified random sampling, cluster sampling, systematic sampling.</p>
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DEPARTMENT OF ELECTRONICS

COURSE OUTCOMES

Semester I

Paper-I (Electronic Components , Network Theorems)

On completion of the course, students are able to:

- Identify the electronic components physically and through symbols, how to calculate the value using color code, the functions and uses of electronic components.
- Know the functions of each block of C.R.O
- Learn different theorems for simplification of basic linear electronics circuits.
- Understand the fundamental concept of semiconductor like crystal structure, energy band gap, charge carrier statistics.
- Understand the physics, basic characteristics and operation of semiconductor devices such as p-n junctions and Zener diodes
- Learn construction and working and application of BJT

Paper-II (Fundamentals of Digital Electronics)

On completion of the course, students are able to:

- Understand various number system.
- Learn Basic gates , symbols, Truth tables, Boolean equations, & working principle.
- Understand combinational and logical digital circuits
- Learn function of basic digital circuits symbols, Truth tables, Boolean equations, & working principle

Semester-II

Paper-I (Semiconductor Devices)

On completion of the course, students are able to:

- Understand Basic Circuits using Active Devices
- Learn function of basic circuit components used in linear circuits.
- Understand basic construction, equivalent circuits and characteristics of basic electronics devices.
- Students understand basic linear electronics circuits and their working principle,

Paper-II(Advanced Digital Electronics)

On completion of the course, students are able to:

- Learn and understand Flip-flop, shifts register, counters and Semiconductor memory for data Processing circuits.

- To learn symbol, working principle of basic Digital electronics circuits for data processing application.
- At the end of this course, students should be able to recognize and analyze the basic digital circuits.

Semester-III

Paper I (Op-AMP And Power Supply)

On completion of the course, students are able to:

- Understand the circuit diagram of DC amplifier and its parameter.
- Understand the block diagram of Operational amplifier, and its applications.
- Understand the basic difference between unregulated and regulated power supply and will be able to differentiate between half wave, full wave and bridge rectifier , their advantages and disadvantages,
- Understand different parameters of power supply.
- Will be able to design fixed and variable power supply using IC regulators such as LM317.
- Will understand the limitations of linear regulators , and concept of SMPS.

Paper II (Electronic Circuit Design)

On completion of the course, students are able to:

- Understand how to proceed for designing the instruments.
- Handle circuit Maker software and will be able to design different circuits and verify their outputs.
- Understand the functional block diagram, working and application of IC 555.
- Understand the block diagram and working of dual trace CRO and function generator.

Semester- IV

Paper I(Analogue and Digital Technique)

On completion of the course, students are able to:

- Learn and Understand the concept of oscillator and their types.
- Learn and Understand the Multivibrator and their types also understand the concept of sample and hold circuit.
- Learn and Understand the concept of A to D and D to A convertors and their types.

Paper II(Electronic Instrumentation)

On completion of the course, students are able to:

- Understand the block diagram of electronic system and types of electronic system.
- Learn and understand transducers, sensors and their different types.
- Learn and understand block diagram of temperature measurement using thermistor and LM 35, Lux meter using LDR, calorimeter, insects repellent using piezo buzzer.
- Learn and understand man instruments systems : EEG,ECG and EMG.

Semester V

Paper I(Electronics Communication)

On completion of the course, students are able to:

- Learn the concepts of communication system.
- Know the various modulations and demodulation techniques.
- Understand AM , FM and demodulation.
- Understand antenna and radio wave propagation used in communication system.
- Learn and Understand the basic concept of digital communication system
- Learn and understand the Fiber optic communications.

Paper II(Fundamentals of Microprocessor)

On completion of the course, students are able to:

- Understand the basic architecture of 8- bit microprocessors.
- Write programs on 8085 microprocessor based systems.
- Identify the addressing modes of an instruction.
- Develop programming skills in assembly language.

Semester-II

Paper I(Programming in “C”)

On completion of the course, students are able to:

- Learn the basics of “C” programming language
- Develop of programming skill to write simple “C” programs.
- Understand basic of the programming language
- Switch any other programming language
- Write C program for simple real life applications using structures.

Paper II(Microcontroller 8051)

On completion of the course, students are able to:

- Differentiate microprocessor and microcontroller.
- Learn the programming and write assembly language program for 8 bit microcontroller
- Understand interrupt and interrupt service routine.
- Learn and Understand the I/O interfacing and techniques.

B. Sc. Mathematics

program objectives/outcomes/specific outcomes

Name of Program: Bachelor of Science (B. Sc. Mathematics)

Nature: Full time

Duration: Three Years (6 Semesters)

Objective of the program:

The objectives of the B.Sc. (Mathematics) program are to develop students with the following capabilities:

1. To provide students with a basic knowledge, insight in Mathematics and correlation with other subjects so that they are able to work as mathematical professional.
2. To provide students with advanced mathematical knowledge of mathematics that prepares them to pursue higher study.

3. To observe and analyze students to deal with the problems of mathematics faced by rural region people in daily routine life.
4. To provide students with capability in formulating and analysis of mathematical models of real life applications.

Outcome of the program:

The successful completion of this program will enable the students to:

1. Pursue post graduation and the Ph.D. degree in mathematics.
2. Surfing recent work and challenges in the emerging areas of Mathematics and try to at least sort out the desert area in it.
3. Demonstrate competence in using mathematical skills to model, formulate and solve real life applications.
4. Acquire deep knowledge of different mathematical and computational disciplines so that they can qualify GATE, JAM examination.
5. Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
6. Imbibe effective scientific communication in both oral and writing.
7. Continue to acquire relevant knowledge and skills through software and manually appropriate to professional activities and demonstrate highest standards of ethical issues in mathematics sciences.

Program Specific Outcomes:

The specific programme outcomes of the course are:

1. Understanding of the fundamental laws in mathematics and capability of developing ideas based on them.
2. Develop mathematical reasoning.
3. Prepare, initiate and motivate students for post graduation in mathematics and related fields and research field too.
4. Provide advanced knowledge and information of reputed institutes in the subject mathematics so that students want to pursue higher degrees in this institute and so that they are ready from their graduation level.
5. Provide knowledge of mathematical software (mathematical equation writing skill, LaTeX documentary language etc) to develop interest of subject amongst the students.
6. Co-relation of the subject with other subjects, in other domain, stream.

Department Of Zoology

Successfully completion of three year degree program in Zoology a student should be able to know:-

Program Outcome

PO1- classification and Identification of organisms according to their characteristic features.

PO2- Correlates the Morphology, physiology and biology of invertebrate and vertebrates.

PO3 -Gain the knowledge of Micro- technique for preserving tissue and specimens.

PO4- Analyze interactions among the various organisms of different phylas, their distribution and relationship with the environment.

PO5-Gain knowledge about economic importance and application of knowledge agro based small industries like sericulture, apiculture, aquaculture, fish breeding, pear-culture.

PO6-understand concept of genetics and its importance in human health.

PO7- understand the use of biotechnology, biostatistics and bioinformatics

Program Specific Outcome

PSO1-Students are able to understand the basic concept of cell biology, environmental biology, genetics, physiology, taxonomy and applied zoology.

PSO2-Understand the application of biological sciences in aquaculture, sericulture, vermin-culture, pearl-culture and apiculture.

PSO3-Perform procedures as per laboratory standards in the area of physiology, cell biology, environmental biology, genetics, entomology, Biotechnology fisheries.

PSO4-Gain knowledge about research methodology i.e. skills of micro technique which consists of preservation of tissue and specimens, their staining techniques

Course Outcome of B.Sc. Zoology

Zoology SEM I

Paper I - Life and Diversity of Animals – Non-chordates (Protozoa to Annelida)	<ul style="list-style-type: none">- Students get knowledge about unity and diversity of life on the earth.- Students will be able to identify and classify non-chordates on the basis of their peculiar characteristics .- students will be able to understand phylum wise structural features, morphology, anatomy, physiology, habit and Habitat.- Students will be able to explain how organisms function at different level of grade of Organization like cellular, tissue, organ and organ system.-They will be able to give examples of the physiological adaptation, development, behavior of different forms of life.- Students understand economical importance of non chordates as well as life cycle of pathogenic organisms.
Paper – II : Environmental Biology	<ul style="list-style-type: none">- students get knowledge and understand about different strata of atmosphere.- students able to understand /recognize biological, chemical, physical components of earths system.-students will also understand how natural system human designed system work together and conflict with each other.- Students understood about environmental issues like water pollution, Air pollution, soil pollution and noise pollution.- Students able to understand and gain knowledge about renewable and non renewable energy sources.
Lab. Course (practical)	<ul style="list-style-type: none">-studied museum specimen (classification and structural features)-learn about estimation of Dissolved oxygen and carbon dioxide PH and hardness of water- studied pond ecosystem-learn about dissection and perform mounting of biological material-

Zoology - SEM II

Paper – III : Life and Diversity of Animals – Non-chordates (Arthropoda to hemichordata)	<ul style="list-style-type: none">- Students understood role of insect vectors in spreading diseases, mode of infection and symptoms.- Students also understood economic importance of molluscans.-Students understood affinities of hemichordates with different phyla.-Students get knowledge about indirect development through various larval stages.
Paper – IV: Cell Biology	<p>Outcome-- students will be able to understand structure and functions of cell and cell organelles .</p> <ul style="list-style-type: none">- students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells and cell organelles- students will understand how these cellular components are used to generate and utilize energy in cells- students will understand types of cell division that is mitosis and meiosis- students will apply there knowledge of cell biology to study environmental or physiological responses of cell
Lab. course(practical)	<ul style="list-style-type: none">-studied museum specimen (classification and structural features)-studied permanent slides of larva of different animals and sections through different organs-perform cell biology experiments, mounting and studied dissection.

Zoology - SEM III

Paper V- Life and diversity of Animals - Chordates (Protochordata to Amphibia)	<p>Students are able to understand diversity of earlier chordate from protochordata to amphibian.</p> <p>Students are also studied about growth and development, evolution of different system of chordates.</p> <p>Students also get knowledge about adaptations, parental care and sexual dimorphism in chordates</p>
Paper – VI : Genetics	<p>Students are able to understand Mendel’s laws of inheritance, basic concepts of gene, transmission of hereditary characters.</p> <ul style="list-style-type: none">- Students also understand about interaction of genes.-Students also understand concept of lethal genes, chromosomal disorder and syndrome caused due to abnormal chromosomal no.- Students also understand about population genetics and application of genetics
Lab. Course (practical)	<ul style="list-style-type: none">- studied museum specimen of chordates (classification and structural features)-observed and studied permanent slides of developmental biology and sections through different organs-perform genetic experiments and studied karyotype of genetic traits.

Zoology - SEM IV

Paper - VII : Life and Diversity of Animals – Chordates(Reptilia, Aves and Mammals)	<ul style="list-style-type: none">-Students understand about classification of reptiles, Aves and mammals based on structural variation.- get knowledge about Biting mechanism in snakes ,adaptations in aves and mammals.- get information about modern evolution theories, genetic basis of evolution-understand comparative study of development of heart and aortic arches in birds, Aves and mammals.- study different aspects of chick development
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Paper - VIII : Molecular Biology and Immunology	-understand detail structure of DNA and RNA as a genetic material ,structure of gene. -students are able to understand different processes like replication, transcription, protein synthesis. -able to understand concept of immunity, types of antigen antibody and their interaction -get information about types of immune response and about immune deficiencies.
Lab. course(practical)	-Studied classification and identification of chordates -studied skeleton of rabbit and fowl -studied permanent slides of chick embryology and permanent slides. -perform staining and immunology and molecular biology experiments.

Zoology - SEM V

Paper IX- General Mammalian Physiology I	-It gives knowledge about structural features and functions of different systems like digestive, respiratory and circulatory. -general properties of enzymes, enzyme activity -digestive glands, respiratory pigments, respiration mechanism and in detail circulatory system.
Paper X- Aquaculture and Economic entomology and	This paper gives knowledge about-application of zoology and economic importance of zoology like fresh water aquaculture, prawn culture, pearl culture, apiculture, sericulture, and lac culture. -gives information about economic entomology and methods of pest control.
Lab.course(practical)	-perform physiology experiments i.e. estimation of carbohydrates, proteins, fats and vitamins. -perform counting of red blood cells and white blood cells. -studied histological slides -Perform mounting, -collection and identification of local fishes. - studied different insect pests.

Zoology - SEM VI

Paper XI- General Mammalian Physiology II	-get knowledge about nerve and muscle physiology, - studied in detail structure and function of different endocrine glands. -understood reproductive system, causes of infertility in male and female.
Paper XII-Applied Zoology II (Bio-techniques ,micro techniques, Biotechnology, Bioinformatics and Biostatistics	-students are able to understand methods of separation of biomolecules ,micro techniques(different staining methods - understand importance and role of bioinformatics - understand application of statistics in biology and biotechnology.
Lab .course(practical)	-detection of urea albumin sugar and creatinine in urine -perform biotechnology experiments and microtechnique methods -perform and studied application of bioinformatics and biostatistics. -observed histological slides.

COURSE OUTCOME, PROGRAMME OUTCOME AND PROGRAMM SPECIFIC OUTCOME

B. Sc Home Science

Fundamentals of Textiles and Clothing (Semester-I)

Course Outcomes

- CO-1. To get acquainted with basic knowledge of textile fibers.
- CO-2. To get the knowledge about latest fibers in textiles and their use.
- CO-3. To know the different tools and equipments required for pattern making and garment construction.
- CO-4. To acquire knowledge of various principles of clothing construction and their application.

Lab Course

- Handling of different tools and equipments required for garment construction.
- Demonstration of taking body measurements
- Preparing album of different decorative embroidery stitches.
- Demonstration and practice of learning the running of sewing machine.
- Drafting, cutting and stitching of basic garments – Apron, Bloomer, Baby frock.

Sewing Techniques (Semester-II)

Course Outcomes

- CO-1. – 1) Know the types of yarn.
2) Understand the spinning process of yarn.
3) To study the blends available in the market
- CO-2. Learn the different types of seams, tucks and pleats.
- CO-3. To acquire skill stitching techniques for various garment components such as pockets, cuffs, collars and fastenings which are ultimately used for stitching of any garments
- CO-4. Learn the types and uses of fashion accessories and application of surface ornamentation.

Lab Course

- Make samples of surface ornamentation.
- Prepare any one fashion accessory.
- Learn types of seams and seam finishes.
- Drafting, cutting and stitching of basic garments.

Textile Design (Semester-III)

Course Outcomes

- CO-1. Learn types, elements and principles of design.
- CO-2. To acquire knowledge about different methods of fabric construction.
- CO-3. To explain the importance of finishes and application of general and special finishes.
- CO-4. Study the different regional embroideries.

Lab Course

- Prepare an album of different regional embroideries.
- Develop designs for various materials like for Sari, Dress material, bed cover and curtain, etc.

Surface Ornaments Technique (Semester-IV)

Course Outcomes

- CO-1. Study the natural and synthetic dyes and procedure of dyeing techniques.
- CO-2. Study the different styles and methods of printing.
- CO-3. Understand the basic preparation of material and printing paste before printing.
To get the knowledge about traditional paintings and prints.

CO-4. To know the costumes of different states of India and traditional Indian textiles.

Lab Course

- Learn dyeing of cotton, silk and wool.
- Learn the process of Block, screen, stencil, tie & dye and Batik printing.
- Make samples and articles by using above printing with combination of techniques learnt.

Advanced Pattern Making (Semester-V)

Course Outcomes

CO-1. Acquire knowledge commercial pattern, pattern markings, principles and importance of layouts of patterns.

CO-2. Learn the different methods of pattern designing.

CO-3. Study the types of darts, different methods of relocation of darts, fitting problems and their remedy, selection of dress design on the basis of art principles and elements.

CO-4. Study the type of plackets, skirts and collars and its variations and construction.

Lab Course

- Learn drafting, cutting, stitching and designing of garments under casual wear and saari blouse.
- Demonstration of draping on dress form.

Fashion Designing (Semester-VI)

Course Outcomes

CO-1. Understand the terminology of fashion, evolution theories, principles, classification of fashion and fashion trends in India.

CO-2. Learn the fashion and clothing theories, flow chart of fashion design process, fashion prediction, fashion forecasting.

CO-3. To acquire knowledge of international fashion centers, fashion categories, fashion psychology, fashion leaders and followers.

CO-4. Learn the fundamentals of apparel productions, fashion marketing and merchandising.

Lab Course

- Designing and stitching of garments for evening wear and cocktail wear.
- Designing and making of fashion accessories.
- Computer aided fashion designing.

Program Outcome

PO-1. To understand different textile fibres and their manufacturing process.

PO-2. Acquire various methods of fabric construction.

PO-3. Acquire skill regarding stitching techniques for various garment components such as plackets, pockets, cuffs, collars and fasteners which are ultimately used for stitching any garment.

PO-4. Create awareness of different dyeing and printing techniques.

PO-5. To impart knowledge of traditional textiles and embroideries of India.

PO-6. Understand the principles of draping fabric on the dressform.

PO-7. To learn basic fashion designing process and apparel manufacturing.

PO-8. To acquaint the students with the factors influencing.

PO-9. To acquire knowledge of fashion marketing and merchandising.

Program Specific Outcome

After successful completion of three year degree programme in B.Sc. HomeScience in the subject Textiles Clothing, Textile Design and Printing, Fashion Designing and Pattern Making, a student should be able to:

1. Because of entrepreneurial development skill in fashion designing they can start their own fashion designing boutique.
2. Since they have the knowledge of textile printing; they can start their own small scale business in textile printing units.
3. Students can pursue higher education in the field of textiles & clothing and fashion designing.

Department of Home Science

PROGRAMME OUTCOME

FOOD SCIENCE AND NUTRITION

- a) Enable to pursue higher education
- b) Understand the role of food and nutrition for the welfare of the community
- c) Excel in the area of personal & public health nutrition
- d) Apply skill based knowledge in food industry
- e) Acquire entrepreneurial skills in the field of food science & nutrition
- f) Public health nutrition for employment in state & central government

HUMAN DEVELOPMENT

- a) Describe how individuals change from Womb to Tomb
- b) Relate principles of human development with self, family & society
- c) Apply methods of teaching and training towards administration of early learning centers
- d) Appraise & identify life situations in need to referral services
- e) Manage life crisis at every life span
- f) Demonstrate skills to assess human behavior
- g) Advocate domain specific programmes & policies
- h) Become Entrepreneurs in establishing learning center

TEXTILES & LAUNDRY

- a) Gain knowledge in Textile Production Techniques
- b) Acquire skill in textile dyeing and printing
- c) Equipped with skill as a designer
- d) Acquire dexterity in Surface Design & Apparel Construction
- e) Acquire entrepreneurial skills in textiles & fashion

FAMILY RESOURCE MANAGEMENT

- a) Students exhibit efficient resource use at home & work as they learn management of resources
- b) Act as proactive agents of change
- c) Career options like Hotel Management, Event Management, Front Office Management, Designing Interiors
- d) Role of able designers

EXTENSION EDUCATION

Competency in Rural Development Practices

Impart skill training programmes

- a) Get sensitized on issues of society

- b) Acquire skill and attitude to work with communities

HUMAN DEVELOPMENT

COURSE OUTCOME

BHSc - SEMESTER 1: FUNDAMENTALS OF HUMAN DEVELOPMENT

UNIT I: Students learn basic concepts, meaning and definitions to study the relevance & scope of the subject Human development & acquire the knowledge of Governmental level projects, schemes and centers where an Human Developmentalist can apply and use knowledge, Concept of child and family welfare and children with special needs.

UNIT 2: Students learn the twin processes namely growth and development to understand how human beings undergo changes. Principles & factors affecting it with theoretical perspective and biological and environmental aspects responsible for the developmental changes.

UNIT 3: Students gain the important life span and stages. Importance of prenatal stage, imp of prenatal care, factors governing the prenatal devt along with WHO concept of child friendly hospitals

UNIT 4: Students understand the term neonate. Characteristics & developmental changes and adjustments & reflexes of an neonate along with the sensory, visual and perceptual abilities of the newborn, concepts like care, health and well-being are dealt with special emphasis and relevance.

BHSc - SEMESTER 2: DEVELOPMENT IN EARLY YEARS

UNIT I: Concept of Early years of child development as important years of life, Infancy stage of development - students understand the terms development tasks & milestones in reference with different developmental aspects.

UNIT 2: Students gain the knowledge of the growing capacities of infants and the overall developmental changes.

UNIT 3: Students gain the knowledge of norms and associated changes in physical, social, cognitive, language, emotional, intellectual capacities with change in moral aspects.

UNIT 4: Students gain the concept of ECCE, objectives and importance cognitive & language growth and conditions facilitating for healthy growth & development.

BHSc - SEMESTER 3: DEVELOPMENT IN LATE CHILDHOOD AND ADOLESCENCE

UNIT III: Students learn the significant Developmental Changes & aspects of development in terms of Physical attainments, Motor Skills, Changing Emotions with importance of Emotional self-regulation, changes in self-concept & importance of Self Esteem, need for attaining basic growth & building self-confidence through their capacities they master during Childhood, also learn the media with its influence on child's development. Relationships within family & outside influencing the child & his potentialities

UNIT II: Students learn the pattern of cognitive & language growth within the conditions & factors facilitating development & theoretical implications & perspective supportive to it. Students gain the growth in terms of morality & moral reasoning acquired during this phase of life.

UNIT III: Students learn the physical changes that occur during the puberty phase of life & the effect of puberty changes. They learn the term & meaning of Adolescence with the growth spurt during this

period of life & concepts like attaining Physical maturity Sexual maturity & Adolescent as a transitional Period, Need of Sex Education.

UNIT IV: Students learn the pattern of changes in respect to intellectual growth ,Cognitive abilities, creative accomplishments & factors for developing creative mind .Adolescent and language accomplishments ,also the concept of need of identity, search for identity with Personality development & factors to determine it. Students get to understand the importance of healthy parent adolescent relationships, Peer relations & its positive advantages & adjustments.

BHSc - SEMESTER 4: DEVELOPMENT IN ADULTHOOD

UNIT I: Concept of who is an adult? adulthood – stages, biological & physiological perspective, diversity in adult life style cultural variations in roles & expectations of adult, life span changes namely physical & cognitive, adult within the framework of work, carrier, parenthood, family & marriage.

UNIT II: Middle age changes, concept of physiology & health. Cognitive & changes in cognitive skills middle age as time of crisis, students understand the importance of age as age of generativity & expertise and experience .concept of aging- approaching retirement , changes and adjustment needed .society and community attachment with an effective social role.

UNIT III: Concept of aging, demographic status, sensitizing towards age related issues & adjustments, importance of recreation and wellness in late adulthood understanding age specific needs

UNIT IV: Specific problems of elderly concept of retirement homes and dwelling. Governmental policies and welfare schemes for senior citizens and elderly.

BHSc - SEMESTER V: FAMILY DYNAMICS AND DEVELOPMENTAL ASSESSMENT

UNIT-I: Students learn the concept of Marriage, changing concept of marriage & forms of Marriage, Eugenics & other considerations in Mate Selection. Concepts like preparation and readiness for marriage. Pre-marriage Counseling - need & importance.

UNIT-II: Family as a nuclear unit of Society. Changing trends & changing concept of Family In Terms of Structure, Constitution, Roles and Demands & Responsibilities. Students are aware of functions & conceptualize the need of healthy interpersonal Relationships, Parental Techniques, Rearing Pattern & need of healthy Disciplinary Methods. Students are trained to understand the Possibilities of Crisis Situation within a Family with a need to Crisis Resolution.

Students learn the Expected Adjustments within the Family Stages namely Establishing, Expanding and Contracting Stage.

UNIT-III: Students acquire the knowledge of assessment, need and purpose along with the concept of Developmental Milestone as benchmarks To Development. Acquire the Skills to perform certain Tests Understanding Tools & Techniques of Infant Testing & Need of Neurological Assessment & need for Assessing Auditory & Visual Impairment.

UNIT-IV: Students get acquainted with the need of & role of Early Stimulation & Developmental Activities for Raising Social, Cognitive, Emotional & Physical & Motor Skills, Language. Students learn Home Interventions,role of parents & Concept of Early Intervention in Developmental Delay. Seek knowledge of NGO'S and Governmental Level **Programmes & Policies of Early Stimulation (Birth to Six Years of Age) with its** Application for Normals & Children with Special Needs.

COURSE OUTCOME

BHSc SEMESTER –VI

CARE AND WELL BEING IN HUMAN DEVELOPMENT

UNIT-I: Students understand the relevance of care & concept of Holistic well-being Understand the need of care giving for attaining Wellness with special attention to Vulnerabilities (age specific) How to draw meaning of Subjective Well Being & it's implication in Understanding Quality of life.

UNIT-II: Students are taught the need to understand Critical Issues in Infancy period, Childhood & Adolescence. concept of wellness with the role& importance of Health care, Nutritional & Psychological Counseling.

UNIT-III: Concept of Care & well-being in Adulthood with Understanding the Needs of Elderly Concept of Wellness at different Stages of Work domains in Adulthood, Health Care.

UNIT-IV: Students acquire the need of facilities Provisions & Policies at Community, State and National Level for Promoting Well Being. Importance & need based Health Programme for the Holistic Approach to Well Being under the Broad Spectrum of Care .Concept of individual and Family counseling.

Department of Microbiology

Program Outcome:

- On Successful completion of degree course where microbiology is one of the subject, student will gain basic knowledge about this subject.
- They will have acquired basic and specialized microbiological laboratory skills needed in research and clinical laboratories, pharma industries, water testing laboratories, food industry etc.
- The students will have sound knowledge of various bio instruments which are routinely used in the microbiology laboratory.
- Students will be able to articulate, retain and apply specialized language and knowledge relevant to the subject.

Class: BSc Semester I

Paper I: History & Microbial Morphology

COURSE OUTCOME

Students learning History and Microbial morphology get knowledge about-

- The origin of microbiology, contribution of various scientists in the development of microbiology, discovery of Rabies and small pox vaccines, Josph Listers contribution in development of aseptic techniques, contribution of Robert Koch in Bacteriology. Students understood the concept of Abiogenesis & Biogenesis and also the concept of Germ theory of Diseases.
- The basic difference between prokaryotic and eukaryotic cell with suitable examples. Students learnt about various internal structural organizations of bacteria in details & its function. Types and function of plasmids. Various types of spores produced & its process of formation as well as germination, different flagellar arrangements in bacteria and pilli were understood by them.
- Students got knowledge of bacterial taxonomy & various methods of bacterial classification, including Bergy's Manual of systematic Bacteriology.

Paper II: Microbial Diversity

COURSE OUTCOME

Students learning Microbial Diversity were able to understand -

- Difference between diverse form of microbes in prokaryotic types including Proteobacteria, Mycoplasma, Rickettsia and Cyanobacteria. Recall general characters, different types, life cycle and applications.
- To know about archae bacteria its types and habitat, characteristics features and their applications.
- Able to understand methods of reproduction in algae, fungi & protozoa.
- To differentiate between mechanisms of Asexual and Sexual modes of reproduction in fungi. Also acquired knowledge about laboratory techniques for cultivation of fungi.
- Industrial importance of algal cells (Cyanobacteria).
- Learnt discovery of viruses, its structure (Symmetry), classification of viruses|(LHT &I CTV) & the characteristics properties of viruses with the other microbes. Lytic and Lysogenic life cycles. Also got information on cultivation techniques for viruses including animal inoculation, chick embryo technique, tissue culture technique.

- Students learnt microbial interactions, difference between negative and positive microbial interaction with suitable examples :- mutualism (symbiosis), commensalism, synergism, syntrophism.
- Negative interactions like antagonism and predation. (The examples of protist-protist, protist-plant and protist –animal). Life cycle of Bdellovibrio explained and students understood concept of predation through this life cycle. Mechanism of bioluminescence and its regulatory genes were understood by them.

Class: B.Sc Semester II

Paper I:Microbial Physiology

COURSE OUTCOME

Students learning Microbial Physiology were given knowledge on the following concepts -

- Student understood the basic nutritional requirements of bacteria. Classification of bacteria on the basis of carbon, energy & electron source into photoautotrophs, chemoautotrophs, chemorganotrophs, and heterotrophs with examples.
- Differentiate between micronutrients and macronutrients required for microbial growth. Different types of microbial cultures. Understood the difference between synthetic and nonsynthetic media and use of selective, differential, enriched and enrichment media with various examples of EMB, MaConkey,BPA,Endoagar media etc.
- Studied different events in bacterial cell cycle and derivation of mathematical expression for bacterial growth.
- Studied the definitions like thermal death point and thermal death time, and disinfectant, bacteriostatic agent, sterilization antiseptic agent etc. Learnt mechanism of cell injury, characteristics of an ideal antimicrobial agent. Various mechanisms of microbial control, use of moist heat sterilization, dry sterilization, filtration, radiation, osmotic pressure etc. Studied the mode of action of chemical agents, antibiotics, chemotherapeutic agents etc.

Class: B.Sc. Semester II

Paper I:Microbial Techniques

COURSE OUTCOME

Students learning Microbial Techniques were able to

- Define the common terminologies like numerical aperture, resolving power etc. Students understood the role of oil immersion objective in compound microscope, understood principle & application of various types of microscopes -compound microscope, Transmission and scanning electron microscope, Atomic force microscope, fluorescence, confocal microscope.
- They could comprehend the difference between stain & dye, its composition. Various important staining techniques like gram staining, endospore staining, capsule staining etc. Principle & Procedures & its preparation.
- They learnt about pure culture, and its importance. How to isolate pure culture of bacteria using streak plate, spread plate, pour plate methods. Use of auxanographic techniques & other selective techniques i.e replica plate method. Also studied growth pattern of various organism on different media.
- Understood cultural & colonial characteristics of bacteria through growth pattern.
- Importance of synchronous culture & its method.

- About growth of bacteria & how to measure the growth of bacteria by physical as well as biological methods which is very important from research point of view.

SEM-III

PAPER-I

Chemistry of Organic Constituents And Enzymology

COURSE OUTCOME

Subject Content:

- classification and Structure of carbohydrate and lipids
- Classification of amino acid, proteins and their structural organisation
- Enzymes and their kinetics
- Structural component and forms of nucleic acid
- Vitamin their types and classification

Levels of achievement

- Students understood organic biomolecules their chemistry, organization etc.
- The concept of organic biomolecules was i.e. carbohydrate, lipids, amino acid, proteins and nucleic acid was explained elaborating the basic chemistry of these molecules along with classification and structural details.
- Students learn basics of enzymology and get familiar with important terms of enzymology.
- They got to know classes, nomenclature and important properties of enzymes.
- Idea of basis of enzymatic reactions, their types and mechanism.
- They understood the experimental approach to enzyme action.
- Students able to learn about effect of heat, pH, concentration and the other factors on the activity of enzyme.
- They analyze kinetic inhibition data and to determine the mechanism of inhibition.
- The difference between cofactor and coenzyme were understood.
- They learn regulation of enzyme activity and turnover.
- The student able to understand the structures of nucleic acids.
- They understood difference between genome organization in prokaryotes and eukaryotes.
- The properties of nucleotides, how they contribute to structures of nucleic acids students also understood the double-helical structure of DNA.
- The students able to understand of all the types of RNA and their biochemical functions.
- The student understood all the classification of vitamins and their biochemical functions.
- They got to know the deficiency symptoms for each fat-soluble vitamin and the conditions in which deficiencies are likely to occur.

PAPER-II

INDUSTRIAL MICROBIOLOGY

Subject Content:

- Fundamentals of industrial Microbiology including types of screening, strain development and sterilization
- Design of a typical fermentor, its parts and process optimizing parameters
- Scale up of Fermentor process and various operations involved in down stream processing

- Production, biochemistry, Recovery and Uses of various fermentation products i.e. SCP, Baker's yeast, antibiotics, beverages, citric acid etc

Levels of Achievement:

- Fundamentals of Industrial microbiology and its application in day to day life were explained to students
- They understood the techniques involved in strain improvements for better production
- Concept of sterilization and its importance was cleared and they learnt how to sterilize fermentor, media, air, etc.
- Students understood design of a typical fermentor, material of construction for fermentor, different parts of fermentor and the process optimizing and effecting parameters.
- Students understood scale up and operations involved in down stream processing i.e product separation, purification and packaging.
- Students understood the concept of industrial production processes.
- The difference between lab scale and industrial scale production was understood
- The basic biochemical changes occurring in cells and also in media were explained and understood by students for various industrial production processes
- Recovery operations were observed and understood by students in video lectures and also idea of different recovery processes was cleared according to the product formed
- Students got to know the importance and uses of the obtained product for human and environmental benefit

COURESE OUTCOME

SEM-IV

PAPER-I

Metabolism

Subject Content:

- Carbohydrate Metabolism by various pathways viz. EMP, TCA, ED, Pentose Phosphate, PK.
- Lipid metabolism by betaoxidation and omegaoxidation
- Replication mechanism of nucleic acid and enzyme involved
- Amino acid breakdown involving deamination and urea cycle, metabolic breakdown of individual amino acid
- Genetic code and protein translation
- Various energy generation modes in metabolism

Levels of achievement

- Students understood organic concept of Metabolism of biomolecules such as carbohydrate, proteins, lipids etc.
- Metabolic pathways for carbohydrate, lipids, amino acid, proteins and nucleic acid were explained elaborating the basic chemistry of these molecules along with regulation.
- Replication, Transcription and translation process were understood by students.
- They understood the various biochemical activities involved in metabolism of a living cell with their enzymatic details.
- They analyze kinetic inhibition data and to determine the mechanism of inhibition.
- They understood difference between genome organization in prokaryotes and eukaryotes and their replication process.
- Students understood energy generating process in metabolic reactions with their significance.

PAPER-II

APPLIED MICROBIOLOGY

Subject Content:

- Different applied Microbiology areas with their basic explanation for better understanding of application based studies in microbiology
- Water Microbiology involving analysis of water samples for check of coliform
- Various water technologies used for analysis if water sample
- Microbial analysis of air and soil by simpler as well as advanced methods
- Role of Microorganism in food preparation, food spoilage and their preventive measures

Levels of Achievement:

- Applications of microbiology in day to day life were explained to students considering various applied areas as per syllabus content
- They understood the techniques in of sampling and handling microflora from air, water and soil.
- To understand significance of bacteriological analysis of water.
- Students understood collection and handling of water samples, indicators of excretal pollution.
- Students understood water treatment using SSF and RSF.
- The difference between lab faecal and non faecal organism was understood
- Application of bacteria and fungi as biopesticides, biofertilizers, PSB, mycorrhiza, for various industrial production processes
- Microbial leaching of copper and uranium was explained
- Students got to know the importance and uses of the preservation technologies for various food as pasteurization, low temperature preservation, chemical preservation etc.

Class: B.Sc. semester V
Paper I: Medical microbiology
Course outcome

Course contents:

- Epidemiology and host –parasite relationship, definitions of various signs, symptoms, syndrome and stages of disease.
- Mode of disease transmission through vehicle, vectors and control of communicable diseases transmission, protecting the susceptible host.
- Microbial mechanism of pathogenicity: pathogenicity and virulence, exaltation and attenuation, MID,MLD,ID 50,LD50
- Normal microflora and virulence factors of bacterial pathogens, pathogenesis, toxigenicity clinical manifestations, lab diagnosis, epidemiology and prevention of diseases.
- Collection and processing of specimens for bacteriological analysis.
- Mechanisms of action of drugs, the molecular diagnostic methods and
- Non automated and automated equipment which may be used for diagnosis in vitro drug susceptibility testing.

Course Outcome

On completion of the course, students are able to:

- Known the terms and terminologies related to medical microbiology
 - Acquired knowledge on community-acquired and nosocomial infections
 - Understood mode of action of antibiotics and drug resistance mechanisms
 - Learned the methods of collecting clinical specimens and their processing.
 - Realized the importance of normal microbial flora in human health
 - Understood the mechanisms of mode of action of different class of antibiotics
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- Understood the bacterial virulence factors and mechanisms and different mode of disease transmission.
 - Acquired complete information on pathogenesis of bacterial diseases
 - Known about the diagnosis of bacterial infections and prevention methods.

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Course outcome

Class: B.Sc. semester V

Paper II: Molecular biology and bioinstrumentation

Course contents

- Gene mutation and regulation, concept of gene, muton, recon, cistron, monocistronic and polycistronic gene, gene within gene, spit gene and lac operon.
- different types Mutation and their mechanism
- Genetic recombination, basic concept of recombination and their various types
- Bioinstrumentation such as chromatography, Centrifuges, HPLC, GC, Spectroscopy UV, Vis, IR its principles and applications.

Course Outcome

On completion of the course, students were able to:

- Analyse how gene expression is regulated at the transcriptional and post-transcriptional level.
- Understood the concept of an operon and the function of the operator, repressor, and co repressor.
- Distinguished between positive and negative control of lac operon.
- Learnt how the lac operon functions and the role of the inducer and the allolactose.
- Understood about the effect of mutations and reasons behind genetic disorders, molecular mechanisms underlying mutations, detection of mutations and DNA damage and repair mechanisms.
- Understood how genetic exchange takes place in microbes.
- Got familiarized with major experiments and discoveries that influenced the development of modern genetics.

- Were able to elucidate the molecular techniques involved in gene manipulation and r-DNA technology.
- Understood the theory of chromatographic separation process and they will be able to apply theoretical knowledge in optimization of chromatographic separation.
- Understood the working, principles and applications of protein and nucleic acid electrophoresis techniques,
- Learnt in detail about the centrifugation technique, how to measure radioactivity, instrument used for detecting and measuring ionizing radiations and use of autoradiography
- Studied the concepts of spectrophotometer, relevant terms of uv-visible spectroscopy and outline of UV spectroscopy device.
- Studied concept, methods and application of r-DNA technology.

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Course outcome

Class: B.Sc. semester VI

Paper I: Immunology

Course contents:

- Defensive mechanism of host: First line of defence and Second line of defence.
- Acquired immunity: Active and Passive immunity.
- Primary and secondary lymphoid organs involved in immune function
- Cells of immune system: general characters of B and T cells, monocytes and macrophages, neutrophils, eosinophils and basophils, mast cells, dendritic cells, Natural Killer cells.
- Primary and secondary immune response.
- Antigens: Definition, complete antigen, hapten, epitope, valence and factors determining antigenicity
- Antibody: Definition, general structure, classes of immunoglobulins and their functions
- General features of antigen-antibody reactions, immunodiffusion, immunoelectrophoresis, agglutination, haemagglutination, tagged antibody test
- Hypersensitivity reactions and their types.

Course Outcome

On completion of the course, students were able to:

- Understand about the basic concepts of innate and acquired immunity.
- Acquired knowledge and information about immunoglobulin structures and diversity of antibodies, morphology and functions of various immune cells such as dendritic cells, macrophages, neutrophils and their association with MHC molecules.
- Understood the basic mechanisms of hypersensitivity responses and their associations with different diseases.

- Learnt about the basic mechanisms of hypersensitivity responses and their associations with different diseases.
 - Acquired knowledge about the basic understanding of immunology and immune responses in response to various infectious and non infectious diseases.
 - Understood the principles underlying various immunotechniques like ELISA,RIA.
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Course outcome

Class: B.Sc. semester VI

Paper II: Biotechnology

Course contents:

- Tools and techniques of genetic engineering, range of enzymes used in DNA, vectors and their types.
- Introducing rDNA into host cell. Expression of cloned genes and construction of gene library
- PCR and its application, DNA fingerprinting.
- Application of genetic engineering in health Biotechnolog.
- Hybridoma technology, monoclonal antibody formation
- Agricultural biotechnology: Protoplast fusion, Biopesticides, Biofertilizers, Industrial biotechnology, Bio sensor and Nano biotechnology applications and ethics and hazards of biotechnology. Genetically modified food definition and example.
- Oriental Fermented food:soya sauce,miso,sufu.
- Transgenic plants. BT Cotton.
- Transgenic animals and clones: Knockout mice, Dollyship, Milching animals.

Course Outcome

- On completion of the course, students were able to
- Learnt the principles and technical advances behind the *in vitro* cells culture and rDNA techniques
- Understood the working and principles of PCR and its application
- Got familiarized with application of genetic engineering in Production of hormones and different types of vaccines
- Understood the Hybridoma technology and monoclonal antibody formation
- Learnt the production of different fermented food products
- Understood the applications of agricultural biotechnology for improving the productivity and performance of crop plants under biotic and abiotic stresses

Department of Computer Science
Program Outcome : B. Sc. Computer Science

Department of Computer Science	Successful completion of three year degree program in Computer Science a student should be able to know :
Programme Outcomes	<p>PO-1 To develop problem solving abilities using a computer</p> <p>PO-2 To build the necessary skill set and analytical abilities for developing Computer based solutions for real life problems.</p> <p>PO-3 To implement quality software development practices.</p> <p>PO-4 To create awareness about process and product standards</p> <p>PO-5 To train students in professional skills related to Software Industry.</p> <p>PO-6 To prepare necessary knowledge base for research and development in Computer Science</p> <p>PO-7 To help students build-up a successful career in Computer Science.</p>
Programme Specific Outcomes	<p>PSO 1: Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.</p> <p>PSO-2 Design, implements, test, and evaluate a computer system, Component or algorithm to meet desired needs and to solve a computational problem.</p> <p>PSO-3 To Enhance skills and adapt new computing technologies for attaining professional excellence and carrying research</p>

Course Outcomes B.Sc. Computer Science

Course	Outcomes
	After completion of these courses students should be able to:
(Semester I) Paper I (Programming in C)	<p>CO-1: To illustrate the flowchart and design an algorithm for a given problem. They understand the basic concept of programming structure.</p> <p>CO-2: Students learnt the knowledge of fundamentals of writing C program which include data types, keywords, tokens, variables, and operators. Develop conditional and iterative statements to write C programs</p> <p>CO-3: To solve user defined functions with real time problems</p> <p>CO-4: Students developed their concepts to write C program that uses Pointers, Arrays, and Strings.</p> <p>CO-5: Understand the knowledge of user defined data types that include structure and union to solve problems.</p> <p>CO-6: Students can write the programs which includes file concept to show input and output of files in C</p>

<p>(Semester I) Paper II Fundamentals of IT</p>	<p>CO-1-Bridge the fundamental concepts of computers with the present level of knowledge of the students. CO-2- Familiarize operating systems, programming languages, peripheral devices, networking, multimedia and internet CO-3- Understand binary, hexadecimal and octal number systems and their arithmetic. CO-4- Understand how logic circuits and Boolean algebra forms as the basics of digital computer CO-5- Demonstrate the building up of Sequential and combinational logic from basic gate.</p>
<p>(Semester II) Paper I Object Oriented Programming Using 'C++'</p>	<p>CO-1: To understand the object oriented methodology which involves elements and features of object oriented programming. CO-2: Students developed the concept of class, object and structure of class which includes definition of class members and also they learned how to write the programs using class. CO-3: Students learnt the basic concept of constructor and destructor. Also they were able to overload the unary and binary operators using the concept of operator overloading. CO-4: Understand how to reuse code by implementing the OOPs Inheritance concept in C++. Also they got knowledge of dynamic objects. CO-5: Students were able to understand how inheritance and virtual functions implement dynamic binding with polymorphism. CO-6: Students learnt how to use exceptional handling in C++ programs</p>
<p>(Semester II) Paper II System Analysis and Design</p>	<p>CO-1- Identify various types of information systems concepts and terminologies CO-2-Discuss the initial phase of system Development Life Cycle (SDLC) using analytical tools and quantitative technique used to identify problem CO-3-Define problem and opportunities that initiate projects CO-4 -Evaluate information systems projects to identify various aspects of feasibility of these projects CO-5- Apply at least one specific methodology or tool for analyzing business situation by modeling using a formal technique.</p>
<p>(Semester III) Paper I Data Structures</p>	<p>CO-1- Analyze run-time execution of previous learned sorting methods, including selection, merge sort, heap sort and Quick sort and also calculate the complexity of all sorting and searching methods. CO-2 - Select appropriate data structures as applied to specified problem definition. CO-3- Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures and design applications based on it. CO-4- Students will be able to implement Linear and Non-Linear data structures. CO-5- Implement appropriate sorting/searching technique for given problem of real time system. CO-6- Design and implementation of advance data structure using Linear and Non Linear data structure. CO-7- Determine and analyze the complexity of given</p>

	Algorithms.
(Semester III) Paper II Operating systems	<p>CO-1- Describe and explain the fundamental components of a computer operating system</p> <p>CO-2- Measure, evaluate, and compare OS components through instrumentation for performance analysis</p> <p>CO-3- Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.</p> <p>CO-4- Describe and extrapolate the interactions among the various components of computing systems.</p> <p>CO-5- Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.</p>
(Semester IV) Paper I Java Programming	<p>CO-1- Knowledge of the structure and model of the java programming language</p> <p>CO-2- Use the java programming language for various programming technologies</p> <p>CO-3- Develop software in java programming language.</p> <p>CO-4- Evaluate user requirement for software functionality required to decide whether java programming language can meet user requirements</p> <p>CO-5- Propose the use of certain technologies by implementing them in the java programming language to solve the given problem</p>
(Semester IV) Paper II Linux Operating System	<p>CO-1- Select appropriate Linux operating system commands to make the effective use of the environment to solve problems</p> <p>CO-2- Write efficient, effective scripts with documentation</p> <p>CO-3- Understanding the basic set of Communication utilities commands and other commands which are used in Linux systems.</p> <p>CO-4- Design an applications using Vi Editor which is provided to the user by Linux and it would also help to manage the system related commands.</p> <p>CO-5- To learn Graphical user Interfaces like KDE and GNOME. .</p> <p>•Co-6- How to provide security to the data by using user authentication and authorization commands like managing user account ,providing user name and password and grant the user.</p>
(Semester V) Paper I Visual Basic Programming	<p>CO-1- Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)</p> <p>CO-2- Develop a Graphical User Interface (GUI) based on problem description.</p> <p>CO-3- Develop and debug applications using Visual Basic 6.0 (or version required for the course) that runs under Windows operating system.</p> <p>Co-4- Develop the programs which are based on events that retrieve input from a file as opposed to input only provided by user.</p> <p>CO-5- Design and Implement Visual Basic applications using Different Menus (Menu Editor).</p>

	<p>Co-6 -Understand the concept of data-driven program execution flow control in Visual Basic programming and also how to store results.</p>
<p>(Semester V) Paper II Database Management System)</p>	<p>CO-1: Students learnt the fundamental elements of traditional file processing system, objective of database system.</p> <p>CO-2: Students learnt the basic concept of different data models which includes Hierarchical, Network, and E-R and Relational model.</p> <p>CO-3:Students are able Design E-R model to represent simple database application</p> <p>PO-4: Students developed the concept of how to convert E-R model into relational tables and how to perform relational operation on tables through relational algebra.</p> <p>PO-5: Students developed the concept of functional dependency and improve the database design by the concept of Normalization.</p>
<p>(Semester VI) Paper I Compiler Construction</p>	<p>CO1:Students learnt the major concept areas of language translation and compiler design</p> <p>CO2: Students got an awareness of the function and complexity of compilers.</p> <p>CO3. Students were able to understand the role of Lexical analyzer, its design, and implementation. Students got knowledge of context free grammars, Derivation and parse trees.</p> <p>CO4. Students are able to identify the similarities and differences among various parsing techniques and grammar transformation techniques</p>
<p>(Semester VI) Paper II SQL and PL/SQL</p>	<p>CO1: Understand the basics of SQL and construct queries using PL/SQL efficiently and apply features for creating database applications.</p> <p>CO2: Compare and Contrast SQL databases with each other and Relational Database Systems</p> <p>CO3: understand the concept of integrity constraints and value constraints to reduced redundancy of data occurs in database applications.</p> <p>CO4: Students are able to learn the concepts like functions, triggers and stored procedure.</p> <p>CO-5- Compare SQL with PL/SQL and integrate the concept of procedural language with SQL to build advance applications.</p>

PROGRAMME OUTCOME FOR B. SC. BOTANY

Department of Botany	After successful completion of three year degree program in Botany a student is able to;
Program Outcomes	<ol style="list-style-type: none"> 1. Students know about different types of lower & higher plants their evolution in from algae to angiosperm & also their economic and ecological importance. 2. Cell biology gives knowledge about cell organelles & their functions 3. Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems. 4. Genetics provides knowledge about laws of inheritance, various genetic interactions, chromosomal aberrations & multiple alleles. 5. Structural changes in chromosomes. 6. Student can describe morphological & reproductive characters of plant and also identified different plant families and classification. 7. They know economic importance of various plant products & artificial methods of plant propagation. 8. Various concepts in ecology and phytogeography. 9. Use modern Botanical techniques and decent equipments. 10. To inculcates the scientific temperament in the students and outside the scientific community.
Program Specific Outcomes	<ol style="list-style-type: none"> 1. Students acquire fundamental Botanical knowledge through theory and practicals. 2. To explain basis plant of life, anatomy, reproduction and their survival in nature. 3. Helped to understand role of living and fossil plants in our life. 4. Understand good laboratory practices and safety. 5. To create awareness about cultivation, conservation and sustainable utilization of biodiversity. 6. To know advance techniques in plant sciences like tissue culture, plant disease management, artificial gene transfer etc. 7. Students understand about the phytogeography of India, ethnobotanically important plants and their use.
Course Outcomes B. Sc Botany Semester-I	
VIRUSES, PROKARYOTES AND ALGAE	<ol style="list-style-type: none"> 1. Study of Microbes and algae to understand their Diversity. 2. Know the systematics, morphology and structure of Viruses, bacteria, Mycoplasma and algae. 3. To know life cycle pattern. 4. To know economic importance. 5. To know evolution of microbes and algae.
FUNGI, LICHEN, PLANT PATHOLOGY, BRYOPHYTA	<ol style="list-style-type: none"> 1. Study of Fungi, Lichens, plant pathology and Bryophyta. 2. To know the systematics, morphology and structure of fungi, Lichens, plant pathogens, hosts and Bryophytes 3. To know life cycle pattern of fungi, lichens, plant pathogens and bryophytes.

	<ol style="list-style-type: none"> To know economic importance of fungi, lichens and Bryophytes. To know evolution of fungi, lichens and Bryophytes.
Semester-II	
PTERIDOPHYTA & GYMNOSPERMS	<ol style="list-style-type: none"> Study of Pteridophyta and Gymnosperms. To know the systematics, morphology and structure of Pteridophyta and Gymnosperms. To know life cycle pattern of Pteridophyta and Gymnosperms. To know economic importance of Pteridophyta and Gymnosperms. To know evolution of Pteridophyta and Gymnosperms.
PALAEOBOTANY & MORPHOLOGY OF ANGIOSPERMS	<ol style="list-style-type: none"> Study of Palaeobotany, geological time scale and morphology of angiosperms. To study the morphology and anatomy of fossil angiosperms. To know the interrelationship of plants on the basis of fossils. To know the tools and techniques used in palaeobotany. To know the systematics, morphology and structure of angiosperms.
Semester-III	
ANGIOSPERM TAXONOMY	<ol style="list-style-type: none"> To Study vegetative and floral characters of angiosperms. To know the preparation of floral formulae and floral diagrams of angiosperms. To know economic importance of angiosperms families. To know evolution of Angiosperms
CELL BIOLOGY, PLANT BREEDING & GENETICS	<ol style="list-style-type: none"> Gain knowledge about cell and its function. Learn the scope and importance of Cell and Molecular biology. To understand ultra structure of cell wall, plasma membrane and cell organelles To understand the biochemistry of cell. To understand the morphology and structure of chromosomes. To understand the different techniques used in plant breeding.
Semester-IV	
ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS	<ol style="list-style-type: none"> To gain knowledge of different plant tissue and tissue systems. To understand structure and type of cells and tissues in plants, type of vascular bundles and stellar systems. To know the development of male and female gametophytes with fertilization in angiosperms. To study development of dicot and monocot embryo.
GENETICS & MOLECULAR BIOLOGY	<ol style="list-style-type: none"> To study structure, biochemical nature and role of nucleic acids. To understand the type and applications of mutations. Understand the Mendelian and neo Mendelian genetics. Know about interaction of genes, multiple alleles and linkage and crossing over. Know about sex linked inheritance, chromosomal aberrations.
Semester-V	
BIOCHEMISTRY & PLANT PHYSIOLOGY-I	<ol style="list-style-type: none"> To study carbohydrates, lipids, amino acids and enzymology. To know the scope and importance of plant physiology. To understand plant & water relation and mineral nutrition. Understand process of photosynthesis, C₃, C₄, CAM pathways. Understand the process of respiration, Photosynthesis and nitrogen metabolism
PLANT ECOLOGY - I	<ol style="list-style-type: none"> To study concept of ecology and ecosystems. To understand climatic and edaphic factors. To know physiographic factors and interrelations among the living organisms. To understand the components of ecosystems, autecology and synecology. To know the phytogeography of India.

Semester-VI

PLANT PHYSIOLOGY-II & BIOTECHNOLOGY	<ol style="list-style-type: none">1. To study Growth, circadian rhythms, biological clock, growth regulators and plant movements.2. To know seed dormancy, plant defense, photoperiodism, senescence and abscission.3. To know the plant tissue culture techniques and applications.4. To understand tools and techniques used in genetic engineering.5. To know the artificial gene transfer techniques.
PLANT ECOLOGY, TECHNIQUES & UTILIZATION OF PLANTS	<ol style="list-style-type: none">1. To study plant successions and plant adaptations.2. To know the morphological and anatomical characters of hydrophytes and xerophytes.3. To know the natural resources and various types of pollutions and its impact on living organism.4. To study microscopy, electrophoresis, centrifugation and chromatography.5. To study scope and importance of ethnobotany.6. To know the economically important plants.

**Programme Outcome
Of
B.Sc.: English and Supplementary English
B.Sc. H.Sc.: English and Communication Skills**

Department of English	Successfully completion of three year degree program in English student should be able to know:
Programme Outcome	<p>PO-1: Confidence building in reading, writing and comprehension skills.</p> <p>PO-2:-Understanding various literature concepts such as theme, characterisation and symbolism and using them in creative writing.</p> <p>PO-3:- Develop formal writing skills that include reports, agendas, memos, emails, resumes, letters that are required for their employment.</p> <p>PO-4:- Experiential learning takes place through classroom discussions and oral presentations.</p> <p>PO-5:-Make students understand cross-cultural understanding of the text written by Foreign writers and Indian writers in English.</p>
Course Outcome	<p>CO-1: Students will be able to develop Life skills through the different life lessons incorporated in the prose and characterisation.</p> <p>CO-2: Students will be able to make sensible and ethical decisions and inculcate moral values those that are demonstrated in the literature.</p> <p>CO-3: Comprehensive skills are developed through reading and writing exercises.</p> <p>CO-4: Students will learn effective use of formal and informal English language.</p> <p>CO-5: Revision of grammar and vocabulary at undergraduate level</p>

