Government Post Graduate College, New Tehri (Uttarakhand)
राजकीय स्नातकोत्तर महाविद्यालय, नई टिहरी, उत्तराखण्ड

Program outcomes, program specific outcomes and course outcomes

MATHEMATICS	
Vision	To be an Orchard of Mathematics, that will be able to cultivate minds with mathematical spirits and nurture the abilities of Mathematical aptitudes.
Mission	Mission of UG and PG Mathematics Programmes is to equip students with analytical and problem solving skills for career, graduate and postgraduate works. The student(s) develop abilities and aptitudes to apply mathematical devices and notions, not only to just solve the problems in Mathematics, but also in related fields such as; basic sciences, computer science, statistics, actuarial sciences. Indeed, these programs are intended to develop the basic understanding of Mathematics as well as its significance/ applications in almost all scientific branches including the sophisticated areas such as AI, Deep learnings, Machine learning etc.
Goal	Goals of Mathematics Programme(s): Produce professional graduates, who will: 1. Be well grounded in the basic manipulative skills level of Algebra, GEometry, Trigonometry, Differential Equations, Calculus and Analysis. 2. Develop and understand the value of logical proof, the single factor that distinguishes Mathematics from all the other disciplines. 3. Be able to transmit Mathematical concepts both orally and in writing. 4. Be aware of the fact that 'how and when Mathematics is assisting mankind in terms of scientific and technological aids'.
Course Outcomes	**UG Course(s):** 1. **Analysis:** After completing this course, student(s) will be able to define the concepts of finite, infinite sets, supremum and infimum, Archimedian property of reals,, adherent points, isolated points limit points, and Bolzano-Weierstrass Theorem. Further, different types of sequences, series and their convergence tests

	will also be learned. 2. **Algebra:** After completing this course, student(s) will be able to understand the notions of set theory including relations, functions, operations, classes etc. Also, basics of complex algebraic structure like, subgroups, groups and rings will be learned. 3. **Differential Equations:** On completion of this course, student(s) will be able to solve different types of ODE's and PDE's using techniques such as; variation of parameters, Fouries series, Lagranian method, Laplace's methods etc. Moreover, students will learn to solve the system of ODEs by elimination and substitution method. 4. **Differential Calculus:** On completion of this course, student(s) will understand the basic properties of functions like limits, continuity and differentiability(partial and successive) and well-known theorems such as Rolle's, Lagrange's and Cauchy's Mean Value Theorems along with their geometric interpretations and applications to real world problems. In addition to this the topics like tangents, normals, curvature, asymptotes, maxima and minima, curve tracing are also learned by the students. 5. **Matrices and Trigonometry:** In this course students will be able to develop skills for solving systems of linear equations using Cramer's Rule, echelon method and Gauss Elimination Method. The concept such as rank, nullity, latent roots, latent vectors of matrices will also be learned. Apart from this in trigonometry the students will be able to understand and derive the formulas for circular and hyperbolic trigonometric functions and the methods of separating such functions in real and imaginary parts. 6. **Integral and Vector Calculus:** On completion of this course, student(s) will be able to distinguish among line integral, definite integral and indefinite integral. Besides this, the generalization of these kinds of integrals, many approaches for solving integral problems which includes Beta Gamma functions and applications in determining volumes and surface of revolutions will also be grasped. In Vector Calculus the learning will include notions like product of vectors, orthogonal vector traits, vector differentiation and integration, gradient, divergence and curl. The significance of some important theorems like Green's, Gauss and Stoke's will also be understood. 7. **Linear Algebra and Linear Programming:** This course offers the students a deep insight approach to understand a more beautiful structure called vector space that includes linear combination of vectors, span, Linear independence and

dependence of vectors .Also the student will learn Linear Transformation, Rank-Nullity Theorem, Isomorphisms, Linear functionals and Dual Spaces. After studying Linear Programming the student will be able to model real world problems and solve them through graphical and numerical methods (Simplex Method).

8. **Numerical Analysis:** In this course student(s) will be able to learn many numerical approaches like Finite Difference Methods, Interpolation, Numerical Differentiation and Integration and Numerical solutions of algebraic and transcendental equations to find approximate solutions of differential equations and polynomials.
9. **Complex Analysis:** In this course primarily the student(s) will be introduced with a fairly new kind of notion called analytic function, the test for analyticity of these functions through the fundamental definition of continuity and differentiability and through Cauchy-Riemann PDE's. Besides this approach of analyticity to evaluate complex integrations, conformal mapping and concept of singularities will also be learned.
10. **Theory of Equations:** Being a part of algebra the basic idea of polynomials, their characteristics and certain rules such as Descarte's Rule, Newton's Method, Secant Method, Bisection Method will be learned.

PG Course(s)

1. **Discrete Structures:** This course is designed to provide students the deep insight into the subject matter of discrete analysis that includes POSETs, Lattices, Boolean algebra and Graph theory.

   After completing this course, students will be able to:

   a. Generalize the notion of classical sets to POSETS, the significance of POSETs in real life problems.
   b. Identify and analyze various types of graphs, such as directed, indirected, connected, non-connected, walk, path and trees.
   c. Understand and apply Boolean algebra to different types of discrete algebraic structure.
   d. Identify and learn challenging problems of the course such as, Towel and Hanoi and Travelling salesman problems etc.
2. **Abstract Algebra:** The course is designed to give students a foundation of almost all Mathematical branches governed by Abstract Algebra. In this course, students will study simple groups, conjugacy classes, Sylow's Theorem, Jordan Holders Theorem, PID, ED and finally UFD.

At the end of this course, students will be able to:

a. Apply the knowledge of algebra to gain good Mathematical ability
b. Built logical thinking and skills.
c. Identify and analyse different types of algebraic structures such as ideals, principal ideals, fields, Integral Domain, PID etc.

3. **Complex Analysis:** The objective of this course is to develop a precise understanding of the need and concepts of Complex analysis that includes analytic functions, power series, Taylor's and Laurent's Series, Singularities, Mobius Transformation, Residues and their application.

   At the end of this course, students will be able to:

   a. Generalize the idea of cartesian products to the real number system that eventually leads us to be familiar with complex number systems.
   b. Evaluate complex integration, limits and continuity of complex functions etc.
   c. Solve problems using Cauchy-Residue Theorem, Rouche's Theorem and Mittag Leffler's Theorem.

4. **Operations-Research**: This course comprises introduction to basic optimization techniques, linear programming problems, Simplex method, assignment problems, transportation problems, game theory, queuing theory, Inventory Control, Markov Chains and Dynamic Programming.

   At the end of this course, students will be able to:

   a. Formulate the real world problems using the optimization techniques.
   b. Apply the results from the optimization techniques to the problems like linear programming problems, transportation and assignment problems, constrained and unconstrained problems.
   c. Continue to acquire skills of queuing theory and game theory that are useful for professional activities.

5. **Differential Equations:** The motive of this course is to introduce ODEs and PDEs of upto second order that includes Bessel and Legendre Differential equations , Heat, Wave and Laplace equations, Sturm Lioville's problems etc.

   At the end of this course, students will be able to:

   a. Understand and solve ode's of various types.
   b. Apply the Picard's Theorem to identify the existence and uniqueness of solution of an ODE.
   c. Check the indepence of solutions of an ODE using Wronskian.

	d. Learn various kinds of special functions like Legendre and Bessel functions whose solutions need a deep understanding of PDE's. 6. **Metric Space and Topology:** This course includes the idea of more advanced structures like metric and topological structures. The objective of this course is to familiarize students about a variety of metric and topological spaces together with the topological properties of the underlying spaces such as continuity, compactness, completeness, connectedness, morphisms and separability. At the end of this course, students will be able to: a. Identify different types of metric spaces such as usual metric, discrete metric, left ray, right ray, co-countable and co-finite metric and topological structures. b. Understand the notions of axiomatic theory of topology, basis, sub-basis and creation of new topological space. c. Learn the topological properties viz. continuity, connectedness, compactness and morphisms. d. Define and learn Hausdorff's Space, Lindelof's spaces, separable spaces like T0, T1, T2, T3 and T4 spaces. 7. **Real Analysis:** This course is designed to provide a deeper and rigorous understanding of the concepts of uniform convergence of sequences and series of functions. This course also includes the Riemann Stieltjes Integral theory, functions of several variables and power series. At the end of this course, students will be able to: a. Apply concepts of real analysis in the study of theoretical development of different mathematical techniques and their applications. b. Deal with the Riemann integration techniques in solving definite- integrals. c. Learn theorems related to power series such as Taylor's Expansion Theorem, Uniqueness Theorem, Abel's Theorem , Weierstrass Approximation Theorem and their implications in the field of science and engineering. 8. **Differential Geometry:** The goal of this course is to make students familiar with the basic concepts of local differential geometry that includes the study of variational nature of various geometric structures like curves, surfaces and spaces. At the end of this course, students will be able to: a. Understand the notions and results related to space curves, tangents, normals, bi-normals and different types of planes like osculating plane, rectifying plane and normal plane.

	b. Learn and validate formulae like Serret-Frenet formula, curvature, torsion and skew-curvature. c. Learn to utilise the non-intrinsic properties of curves and surface in deducing the formula of normal curvature, principal directions, principal curvatures and minimal surfaces. 9. **Calculus of Variations**: The objective of this course is to introduce a variation of functional, continuity and differentiability of the functionals that reveal the necessary and sufficient condition for extrema. At the end of this course, students will be able to: a. Analyse the functionals using continuity and differentiability properties . b. Derive necessary and sufficient conditions for functional to be extremum using Euler's Theorem, second variational approach, Legendre and Jacobi necessary condition theorem. c. Understand least action principle, conservation law and Hamilton-Jacobi Equations. d. Develop transformations of ODEs and PDEs into functionals and their solutions using Ritz Galerkin Method. 10. **Mechanics:** The objective of the course is to equip the students with the knowledge of generalised coordinate system, conservation laws, equation of energys. At the end of this course, students will be able to: a. Understand the concept of generalised coordinates that lets them know about various kinds of mechanical system like holonomic, rehonomic and scleronomic. b. Understand and deduce conservation laws of linear and angular momentum under finite and infinite impulsive forces. c. Understand conservation of energy, Lagrange's equation of motion and Hamiltonian Principle of least action. 11. **Functional Analysis:** The goal of this course is to develop deep understanding of functionals, transformations and operators and their properties. At the end of this course, students will be able to: a. Classify linear spaces,inner product spaces, normed linear spaces, Banach spaces and Hilbert Spaces. b. Know the need of such spaces to find the solutions of variational problems. c. understand=d the four pillars of functional analysis: Uniform Bunded

Theorem, Hahn-Banach Theorem , Riesz Representation Theorem and Closed Graph Theorem.

12. **Fuzzy Set Theory:** The objective of this course is to develop the basic understanding of crisp sets and shifting these concepts towards the more advanced notion calle fuzzy sets and its applications in the real world.
    At the end of this course, students will be able to:
    a. Distinguish between crisp sets and fuzzy sets. The algebraic operations on fuzzy sets like union, intersection, norm and corn of fuzzy sets will also be learned.
    b. Learn Zadeh's Extension Principle to analyse the images and inverse images of fuzzy sets.
    c. Define fuzzy logics, multi-valued logics, fuzzy propositions and fuzzy quantifiers in linguistics.
    d. Use the applications of fuzzy theory in artificial intelligence, machine learning, electronics etc.
13. **Mathematical Statistics:** The primary goal of the course is to develop understanding of data analysis among the students that includes various types of sampling methods, distributions, estimations and analysis. The course also aimed at the understanding of probability theories and hypothesis testing.
    On completion of this course, the students will be able to:
    a. Handle big data and drawing inference from it by implementing suitable statistical techniques.
    b. Learn the basics about the measures of central tendency, dispersion and their ramifications in various scientific problems.
    c. Distinguish and describe different types of discrete and continuous data distributions and their utilization.
    d. Understand learn the concept of sampling, different sampling methods and data reduction techniques (e.g., PCA, cluster analysis, ICA etc.)
14. **Measure and Integration:** This course is meant to provide the students, a theoretical foundation of the concept of mathematical analysis, which includes many applications in pure and applied branches of mathematics.
    At the end of this course, the students will be able to:
    a. Understand the need of measures of open and closed sets, advantage of Lebesgue measure over the measure.
    b. Recognize the measurable functions, step functions, characteristic

functions and simple functions.

c. Learn Algebra of measurable functions, proof of Egoroof's theorem, Riesz-Fisher theorem.

d. Solve problems pertinent to functions of bounded variations, absolute continuity and Lebesgue differentiation.

15. **Linear Integral Equations**: This course is designed to familiarize the students about the more complex problems which can not be merely solved with the aid of differential equations. The aim of the course is to provide the knowledge of basic building blocks of Integral equations and their applications in relevant branches.
    At the end of this course, the students will be able to:
    a. Gain the fundamental idea of integral equations and their need.
    b. Classify integral equations and learn methods for their solutions.
    c. Tackle problems with the help of Fredholm and Volterra approach.
    d. Learn classical Fredholm theory, Hilbert type integral equations and integral equations with Green's type kernel.
16. **Number Theory**: This course is intended to provide students an introduction of classical number theory and enable them to understand the significance of number theory in handling the real world problems.
    On completion of this course, the students will be able to:
    a. Learn the properties of the number system apart from arithmetics.
    b. Apply the concepts of number theory to attain a mature mathematical thinking.
    c. Utilize congruence, Chinese remainder theorem, Fermat's theorem and Wilson's theorem to solve a variety of problems.
    d. Design, analyze and implement the Diophantine equations for solving different problems.
17. **Fluid Dynamics**: The motive of this course is to provide a treatment of complex topics in fluid dynamics, where the students will be able to understand the science behind fluid motion.
    At the end of this course, the students will be able to:
    a. Grasp the concept of fluid kinematics with specific methods such as, Lagrandian and Eulerial method of describing the fluid motion.
    b. Deduce Euler's equation of motion, Bernoulli's equation, Cauchy's equation and Helmholtz's equation of motion.
    c. Validate Kelvin's minimum energy theorem, Milne circle theorem, Green's

	theorem and Blausius theorem. d. Derive equation of motions in two dimensions, stream functions, complex potential and circulation equations.

PHYSICS	
Vision	"Excellence in Physical Sciences and building a knowledge society" The Department of Physics, Faculty of Science, Govt. P.G. College New Tehri is the leading center for scientific research and college level educational program in the field of physics. Faculty of the Department of Physics collaborate on joint projects with the National Research Centers(BARC) and HNB Garhwal University to contribute to the development of knowledge. Their scientific work is connected with innovative teaching techniques, thus providing a creative and stimulating environment for the education of future generations of physicists.
Mission	The main mission of the Department of Physics include continuous improvement of the quality of teaching, scientific research, the development of innovative curricula and techniques based on research and the latest scientific discoveries. To promote science in the local community level and also to participate in the developing of educational program for teaching of physics in primary and secondary education. To promote new areas of research, with an emphasis on interdisciplinary and applied Research. To encourage the development of educational physics through primary and secondary education by participating in the development of the curriculum, developing methodology of physics education, teaching aids and textbooks, through training of teachers, and particularly through continued work with students that were recognized as extremely talented. To promote the highest ethical principles in scientific research, critical thinking, openness to social, scientific, technological and educational changes.

Goal	What are the "big items" I want my students to take away from my class? It's a big question... of course I want them to do a great job on their exams and understand our course content, but I realize that a vast majority of them forget a majority of Physics concepts shortly after leaving the classroom. What are the enduring understandings and learnings that really matter? Our goal is to develop the below mentioned qualities within the students: 1. Develop a solid understanding of physics, both conceptual understanding and the ability to solve problems. 2. Learn to teach him/her self. 3. Think critically. 4. Be confident in his/her ability to attack an unfamiliar problem. 5. Utilize the scientific method. 6. Act like a professional 7. Work productively in diverse groups. 8. Learn to recognize what thay don't know (metacognition). 9. Learn how to teach. 10. Be passionate about something. 11. Learn from his/her mistakes. 12. There is nothing he/she cannot accomplish if he/she set his/her heart and mind to it.
Course Outcomes	After successful completion of B.Sc./M.Sc. Physics Course student will be able to: ● Understand the depth knowledge of various subjects of Physics. ● Demonstrate skills and competencies to conduct wide range of scientific Experiments. · Identify their area of interest in academic and R&D. **Mechanics**: Students will be able to describe: · Relative motion. Inertial and non-inertial reference frames. · Parameters defining the motion of mechanical systems · Study of the interaction of forces between solids in mechanical systems. · Centre of mass of mechanical systems. · Laws of motion and conservation principles. ● Principles governing momentum, energy, and angular momentum. **Electricity and Magnetism**: Students will be able to have: ● Understanding of electric and magnetic fields. ● Interaction of charges and fields.

	• Maxwell's equations, electromagnetic radiation, simple electronic circuits. • Understand the relationship between electrical charge, electrical field, electrical potential. • Define the magnetic field and magnetic flux, solve technical problems. • Calculate the magnitude and direction of the magnetic field for symmetric current distributions using the Law of Biot-Savart and Ampere's Law **Thermal and Statistical Physics**: Completion of this course will enable the students to: · Know the basics of thermal physics. · Make use of different problem solving techniques in the field. · Understand the kinetic theory of gases: Maxwell –Boltzmann distribution law, Brownian motion etc. · Understand the behavior of real gases. • Basic concepts of energy, entropy, temperature and the heat capacity of solids. **Modern Physics:** Students will have understanding of: • Special theory of relativity. • Inertial reference frames. • Time dilation, length contraction. • Principle of equivalence. • Wave-particle duality. • Schroedinger's equation. **Mathematical Physics**: Students will have understanding of: • Various techniques to solve differential equations • How to use vector calculus • Use, advanced mathematical methods and theories on various mathematical and physical problems. • Understand the Fourier theorem and its applications. • Understand matrix and partial differential equations. • Understand complex analysis. • Understand the integral transforms. **Waves and Optics**: Students will be able to: • Understand the role of the wave equation and appreciate the universal nature of wave motion.

	● Understand superposition of harmonic waves. ● Understand interference and diffraction (Fraunhofer and Fresnel diffraction) ● Understand optical phenomena such as polarization. ● Through the lab course, understand the principles of measurement and error analysis and develop skills in experimental design. **Environmental Studies**: Students will have understanding of: · Scope and importance of environmental studies. · Forest, Grassland, Desert and aquatic ecosystems. · Biodiversity and causes of environmental pollution and its impact on Human communities. · Environmental issues Global warming, Climate change, Acid rain, Ozone depletion. · Acts related to protection of Environment, wildlife, water air, etc. **Digital Principles and Applications**: Completion of this course will enable the students to: · Understand the logical behavior of digital circuits · Understand the advantages and disadvantages of programmable logic devices · Know how to describe digital hardware using a software-style language ● Understand how a basic microprocessor can be built from standard building blocks. · Understand CRO basic and IC fabrication. **Electrical Circuits and Network Analysis**: After successfully studying this course, students will: ● Understand various network theorems. ● Understand basic of electricity principles and electrical circuit. · Be able to systematically obtain the equations that characterize the performance of an electric circuit as well as solving both single phase and three-phase circuits in sinusoidal steady state. · Acknowledge the principles of operation and the main features of electric machines and their applications. · Acquire skills in electrical protection and wiring.

	Analog Systems and Applications :Completion of this course will enable the students to: · Acquire a basic knowledge in solid state electronics including diodes, BJT, and operational amplifier. · Develop the ability to analyze and design analog electronic circuits using discrete components. · Design, construct, and take measurement of various analog circuits to compare experimental results in the laboratory with theoretical Analysis. · Understand the hybrid equivalent of different transistors. **Solid State Physics**: Students will have understanding of: · Structures in solids and their determination using XRD. · Behavior of electrons in solids including the concept of energy bands and effect of the same on material properties. · Magnetic and dielectric properties of solids. · Practice problem solving by using selected problems in solid state physics. · Superconductivity basics. **Laser Physics:** Completion of this course will enable the students to: · Understand and explain the principles and design considerations of various (solid state, gas and semiconductor) lasers, modes of their operation and areas of their application. · Understand the principles of ultrashort pulse generation and amplification. · Understand trends of development of modern lasers · Gain the basic skills of practical work with lasers. **Classical Mechanics**: Students will have understanding of: · The terminology used in Classical Mechanics. · Lagrangian and Hamiltonian formulations. · essential features of a problem (like motion under central force, rigid body dynamics, periodic motions), use them to set up and solve the appropriate mathematical equations, · Understand Variational principle and Canonical transformations **Quantum Mechanics**: Completion of this course will enable the students to:

	· Understanding of: Importance of quantum mechanics compared to classical mechanics at microscopic level. · Understand various tools to calculate Eigenvalues and total angular momentum of particles. · Understand Schrodinger's equation for spherical symmetric potential, complete solution of hydrogen atom. · Understand atoms in external magnetic field. **Statistical Mechanics**: Completion of this course will enable the students to: · Understand how statistics of the microscopic world can be used to explain the thermal features of the macroscopic world. · Use thermal and statistical principles in a wide range of applications. · Learn a variety of mathematical techniques. · Understand Bose-Einstein and Fermi Dirac statistics. · Establish connection between statistics and thermodynamics. **Nuclear and Particle Physics**: Upon completion of the course Students will have understanding of: · Basic properties of nucleus and nuclear models to study the nuclear structure properties. · Various aspects of nuclear Experimental physics: error analysis, curve fitting, data analysis, simple electronic circuits, implementation of fundamental experiments such as optical spectroscopy, electron diffraction and interferometry. ● Learn basic experimental methods such as lock-in amplification, analog to digital conversion, image capture, etc.

CHEMISTRY	
Vision	To create and maintain the teaching programmes which nurture the fundamentals concepts of chemistry and meet the global needs through chemical science and to achieve excellence in teaching and research..
Mission	Mission of UG and PG Chemistry Programmes is to strive a balance between knowledge

	creation and their worthy applications. To offer projects and courses of global interests to build up research interest in students, to provide innovative scholars, entrepreneurs. To promote among our learners the skills of analytical thinking and experimentation.
Goal	Goals of Chemistry Programme(s): Produce professional graduates, who will: 1. Acquire expertise in a specific discipline of chemistry. 2. Understand the behavior of matter and synthesize new ideas in their field. 3. Be able to interpret meaning chemical data and draw conclusions. 4. Be able to solve problems and conduct work with high standards of safety. 5. Be able to work in the field of green chemistry to safeguard environment.
Course Outcomes	**UG Course(s):** **1. INORGANIC CHEMISTRY.** After completing this course student(s) will be able to understand the nature and property of atoms, their bonding. They will learn deep insight about periodic table, position of elements, s-block, p-block, transition and inner-transition elements, their chemical behavior and bonding between different elements. They will be able to solve and balance the chemical reactions. Under this course they will study about structure of atom and bonding, Periodic properties etc. **2. ORGANIC CHEMISTRY.** After completing this course student(s) will learn about naturally occurring and synthesized organic compound, their Structure and bonding in organic compounds viz; Hyperconjugation, Inductive effect, Resonance, dipole moment and hydrogen bonding as well as reaction intermediates. They can interpret the concept of aromaticity. Understand the nucleophile and electrophile groups and their properties. They can derive mechanism of a reaction with the knowledge of different functional groups. Stereochemistry which plays important role in pharmaceutical chemistry will be well understood by them. **3. PHYSICAL CHEMISTRY.** After completing this course student(s) will be able to understand about the solid, liquid and gaseous states of matter. They will learn about the types of solids like ionic solids and covalent solids. Types of crystal lattice and their defects. Liquids and properties of liquid such as viscosity and surface tension. They will also come to know about Colloids, Classification of colloids and general application of colloids. This course offers the deep insight approach about the Real gases and ideal gases, Kinetic theory of gases and their applications. Electrochemistry, thermodynamics and their applications.

4. SPECTROSCOPY. On completion of this course student(s) will be able to solve the structural problems of organic compound after learning U.V., I.R., NMR etc. They will able to monitor the progress of reaction using spectroscopic data.

5.BIO-INORGANIC CHEMISTRY. On completion of this course student(s) will be able to understand the correlation between chemistry and nature.They will come to know about essential and trace elements, understand about the chemical reaction going on in our body and nature and the importance of metals in conducting these reactions viz; hemoglobin, myoglobin and photosynthesis.

6. LABORATORY WORK. This course help student(s) to analyse and identify the elements by various chemical tests.They also do the identification of organic compounds with flame test, melting point. Learn about various titration like Redox, Iodometry, Iodimetry. Experiments like surface tension and viscosity help to understand the behavior of liquid.

PG Course(s):

1.GROUP THEORY and ANALYTICAL TECHNIQUES. This course is designed to provide students the deep insight of symmetry elements and symmetry operations in chemical molecules.

After completing this course students will be able to;

(a)Learn the definition of group and point group operations.

(b)Solve matrix problems.

(c)Understand applicatons of group theory.

2.REACTION MECHANISM OF TRANSITION METAL COMPLEXES.

On completion of this course student(s) will be able to understand the energy profile of a reaction and metal complexes.Outer sphere and inner sphere complexes. Substitution reaction in octahedral complexes and square planar complexes.

3.STEREOCHEMISTRY OF ORGANIC COMPOUNDS. This course is designed to provide student(s) the deep insight of molecular symmetry and chirality, point group, chiral centres. Topicity and their nomenclature as well as stereoselectivity, regioselectivity and chemoselectivity. They will also learn about enantiomers and diastereomers.This topic finds

application in the field of drug and pharmaceutical industry.

4.QUANTUM CHEMISTRY. This course is designed to give the introduction of De Broglie's equation and its applicaton. Postulates of quantum mechanics, particle in one , two and three dimensional box. Approximate methods of quantum mechanics, variational method sand perturbation theory. Angular momentum, ladder operator. Bonding and antibonding MO according to LCAO method. 2After proper understanding students will be able to solve the problems related to energy levels, bonding orbital and antibonding orbital etc.

6. **SURFACE CHEMISTRY.** On completion of this course student(s) will be able to understand about the thermodynamics and kinetics of adsorption, BET method and heterogenous catalysis. They will be able to understand the mechanism of micelle formation , variation of porosity with catalyst.

6 .CHROMATOGRAPHIC AND RADIO ANALYTICAL METHODS.

The objective of this course is to provide student(s) the deep insight of Basic principles and types of chromatography, principle and application of GAS CHROMATOGRAPHY, HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) and Ion-exchange chromatography.
After completion of this course, students will be able to:

(a) Study the progress of any reaction with the help of chromatography.
(b) Purity of synthesized compound can be checked by HPLC.
(c) Enantiomeric excess can be studied by these techniques.

7.MEDICINAL CHEMISTRY. The objective of this course is to provide student(s) the deep insight of development of new drugs, concept of pro drugs and soft drugs.They will also study about pharmacokinetics, elimination using pharmacokinetics and its application in drug development process. Pharmacodynamics, drug metabolism, biotransformation and significance of drug metabolism in medicinal chemistry. They will also learn about Antineoplastic and Antibiotics.

8.HETEROCYCLIC COMPOUNDS. The objective of this course is to give introduction of general chemical behaviour of aromatic heterocycles, five membered and six- membered heterocyclics: preparation and application. Conformation of six-membered heterocycles with reference to molecular geometry. Synthesis and reactions of azepines, oxepines, thiepines, diazepines, thiazepines etc.

	After completion of this course, student(s) will be able to: **(a)** They will be able to understand naturally occurring heterocycles like chlorophyll, haemoglobin, vitamins. **(b)** Their significance in drugs. (c) Their application in the development of sanitizers, corrosion-inhibitors, anti-ordinates. **9.ENVIRONMENTAL CHEMISTRY.** On completion of this course student(s) will be able to understand concept and scope of environmental chemistry, environmental terminology and nomenclatures, composition of the atmosphere, acid-rain, smog formation, introduction to analytical methods for monitoring air pollution. Water quality parameters like DO, BOD, COD, fluoride ,oils\, grease and toxic metal concentration like Hg, Pb, Zn, Cr etc. They will also understand about Particulates, aerosols, pesticides etc. **10.ORGANIC SPECTROSCOPY.** The objective of this course is to provide deep insight understanding of various spectroscopic techniques like U.V., I.R.,NMR, Mass spectrometry. After completion of this course, student(s) will be able to: (a) They will be able to solve the structural problems using the spectroscopic data. (b) They can differentiate between different functional groups using I.R. and N.M.R. data. (c) They will understand 2D NMR like DEPT, COSY, ROESY etc. **11. ORGANIC SYNTHESIS.** On completion of this course student(s) will be able to understand about the disconnection approach, functional group interconversion, chemoselectivity, reversal of polarity. One group and two group C-C disconnections: alcohols and carbonyl compounds regioslectivity,control in carbonyl condensation. Ring synthesis and protecting groups: saturated heterocycles, principle of protection of alcohol,amine,carbonyl and carboxyl groups as well as synthesis of complex molecules like Cortisone, Vitamin-D, Juvabione etc. **12. CHEMISTRY OF NATURAL PRODUCTS.** On completion of this course student(s) will be able to understand about the classification, occurrence and methods of determination of terpenoids and carotenoids. This course also includes the occurrence, physiological action and synthesis of Steroids, Alkaloids and vitamins.They will study abut synthesis and

	application of sulpha drugs, morphine ,chloroquine, ampicillin, amoxicillin etc. **13.ORGANIC PHOTOCHEMISTRY.** On completion of this course student(s) will be able to understand about the basics of photochemistry like absorption, excitation, excited states. They will understand the significance of Flash-Condon principle, Jablonskii diagram, photophysical and photochemical process. Quantum yields. Photochemistry of organic compounds, photochemistry of carbonyl compounds and significant reactions like Norrish type-I and Norrish type-2 reactions.Some other significant photochemical reactions like photo-fries rearrangement and Hoffman-Loeffler Fretyag reactions. **14.LAB COURSE WORK.** This course aimed to understand the experimental analysis of Extraction of organic compounds from Natural Sources:Isolation of caffeine from tea leaves, isolation of casein from milk, isolation of piperine from black pepper. Synthesis of heterocyclic compounds: preparation of quinoline from aniline, fisher-indole synthesis etc. Spectrophotometric Estimation like Amino acids, carbohydrates, Aspirin, Caffeine. Multi-step synthesis of Organic compounds and their detection by the application of chromatographic techniques. Qualitative analysis of mixture of three organic compounds using TLC.

BOTANY

Department of Botany

Program Outcomes

PO1. Knowledge and understanding of:

The range of plant diversity in terms of structure, function and environmental relationships. 2. The evaluation of plant diversity. 3. Plant classification and the flora of Uttarakhand. 4. The role of plants in the functioning of the global ecosystem. 5. Statistics as applied to biological data.

PO2. Intellectual skills – able to: 1. Think logically and organize tasks into a structured form. 2. Assimilate knowledge and ideas based on wide reading and through the internet. 3. Transfer of appropriate knowledge and methods from one topic to another within the subject

PO3. Practical skills: Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. 1. Interpreting plant morphology and anatomy. 2. Plant identification. 3. Vegetation analysis techniques. 4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry. 5. Analyze data using appropriate statistical methods and computer packages. 6. Plant pathology

PO5 Scientific Knowledge: Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.

PO6. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.

PO7. The Botanist and society: Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

PO8. Environment and sustainability: Understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Learning outcomes for Program specific outcome
Postgraduate Programme M.Sc. Botany
Upon successful completion of M.Sc. Botany Post-Graduates are expected to

PSO1: Develop a conceptual understanding of principles and importance of Botany. Students would be benefited with knowledge of core subjects like plant diversity, physiology and biochemistry, molecular cytogenetic and application of statistics etc. which are offered in these subjects Modules on analytical techniques, plant tissue culture and photochemistry would make them obtain skills that help in doing research.

PSO2: Learn about practical technique in lab for detail study of plant cell structure, reproduction, anatomy, breeding procedures for hybridization. Maintain a high level of scientific excellence in botanical research with specific emphasis on the role of plants. Create, select and apply appropriate techniques, resources and modern technology in multidisciplinary way. Practice of subject with knowledge to design experiments, analyze and interpret data to reach to an effective conclusion.

PSO3: They would identify, formulate and analyze the complex problems with reaching a substantiated conclusion. Logical thinking with application of biological, physical and chemical sciences. Learning that develops analytical and integrative problem-solving approaches.

PSO4: Students would perform functions that demand higher competence in national/international organizations with sporty and helping spirits. Prepare the students for many competitive exams like UKPSC, UPSC NET SET GATE.

PSO5: Best problem-solving skills in students would encourage them to carry out innovative research projects thereby making them to use knowledge creation in depth. Enable the students to be resourceful in identifying the plants PSO6: Knowledgeable, disciplined students with good values, ethics, and kind heart will help in nation building globally. Student should be aware of ethical issues and regulatory considerations while addressing society needs for growth with honesty

COURSE OUTCOMES

Course Outcomes of B.Sc.

CO1. Critically evaluation of ideas and arguments by collection relevant information about the plants, so as recognize the position of plant in the broad classification and phylogenetic level.

CO2. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

CO3. Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations.

CO4. Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.

CO5. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history.

CO6. Students will be able to explain how Plants function at the level of the gene, genome, cell, tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants.

CO7. Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

CO8. Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialize

Course Outcomes of M.Sc. Botany

Microbiology & Fungi After completion of this course - CO1: Students will be able to understand the structure, type and identification of Bacteria and cyan bacteria. CO2: Students will gain understanding of Thallus structure, reproduction and economic importance algae. CO3: Students will gain understanding of the classification, structure of mycelium reproduction of fungal species. They will know about the hazardous and useful fungi. Student will also know and learn classification and evolutionary trends in fungi. CO4: Students will gain understanding of the plant diseases, causal organism, host and their relationship and control measure for plant diseases, Understanding of fungicide and use of chemical physical and biological controlling of diseases mentioned in the unit.

Algae and Bryophytes: After completion of this course students will gain knowledge of - CO1: the characters, distribution, classification and regeneration in Algae and Bryophytes. CO2: the characters of different orders of algae and Bryophytes.

Pteridophytes , Gymnosperm and Paleobotany After completion of this course Students will gain Understanding of - CO1: How the stele evolution occurs in Pteridophytes . CO2: the classification of Pteridophytic classes and the morphological and anatomical characters of genus included in the different Pteriodophytic order. CO3:the meaning of fossil and its use in the determination of age of plant materials, Understanding the applied knowledge and different aspects of Paleobotany. CO4: Students can critically differentiate fossil and living fossil. Students will also understand the evolutionary tendencies and comparative morphology of Cycadales, Cycadeodales and Pteridospermales. Co5: Students can compare the characters of different orders &relationship of each order from Cordaitales to Gnetales. CO4: Student can critically differentiate the characters of three orders of Gymnosperm i.e., Ginkogales, Coniferales, and Taxales.

Taxonomy of Angiosperm- After completion of this course - CO1: Students will have developed the knowledge of identifying floral variation. CO2: Students will know the interesting features & systematic position of cucurbitaceae, cactaceae, orchidaceae, etc. CO3: Students will be able to know the probable ancestors of angiosperms, extinct species. CO4: Students will develop understanding about the role of biodiversity in Ecosystem functions.

Plant development and Reproduction : After completion of this course - CO1: Student will understand the role of various hormones in plant development. They will understand how growth of shoot apical meristem takes place. CO2: Student will get knowledge about the various arrangement of leaf in plants. CO3: Students will understand how endosperm provides nutrition to embryo development. They also understand how germination of seed takes place in plants. They are able to differentiate the types of endosperms. CO4: Students can understand the relation between embryo and endosperm. Students will get idea about practical importance of polyembryony. CO5: Students are able to know overall development of endosperms. Students will develop understanding of the formation of embryo from somatic cell

Cytology and Genetics After completion of this course students will gain - CO1: Understanding of the history of gene from 'something', 'factor'; and gene and one gene one enzyme one characters hypothesis. Student will also know the interaction of gene, genetic recombination producing the characters differently. CO2: Understanding of the structure of chromosome and how the packaging of DNA occurs. Student can differentiate Euchromatin and heterochromatin region of chromosome on the basis of staining properties. CO3: Understanding of the different structural and numerical changes why? And how? It occurs in the chromosome students, can able to use the trisomic and monosomic for the chromosome mapping. CO4: Understanding the role and process of mutation and different mutagenic agent which brings about mutation in the organism. Students will also understand the role of mutation in crop improvement and permutation.
Plant physiology and Biochemistry After completion of this course - CO1: Students will understand the importance of photosynthesis in plants. They will also understand photosynthesis is one of the most important processes that allow plants to Live. CO2: Students will come to know that, energy produced by respiration is essential for normal functioning of body. CO3: Student will understand importance of metabolism to maintain living state of cells. They also understand role of nitrogen cycle in environment. CO4: Students will understand how enzymes serve important function in body, in digestion and metabolism. They have developed knowledge about pathways of water through xylem and phloem.

Plant Ecology After completion of this course - CO1: Students will understand the vegetative organization in community. Students will get to know about how changes take place during ecological succession. CO2: Student will have developed knowledge about structure and function of ecosystem. They also will understand about biogeochemical cycle in environment and its role. CO3: Students will understand the effect of air, water and soil pollution in environment. They will also develop knowledge about greenhouse gases its sources and role. CO4: Student will get knowledge about invasive species of plant. They will get to know about how ecological management takes place.

Cell and Molecular biology- After completion of this course - CO1: Students will understand the structure and functions of ribosomes. They will get to know about how transcription and translation takes place in Prokaryotes and Eukaryotes. Course Outcomes Botany Page 6 CO2: Students will understand about fine structure of gene. They will also understand machinery involved in protein sorting. CO3: Students will get to know about the structure of phage genome. They will also develop knowledge about genetic recombination. CO4: Students will understand about cell cycle and apoptosis. They will get knowledge about the process of signal transduction. Reproductive Biology of Angiosperms- After completion of this course - CO1: Students will understand the structure of Anther and it's various. They will understand about pollen wall protein. CO2: Students will understand the development of male gametophyte. They will get to know about biochemical aspects of pollen. CO3: Students will understand carpel determination of pistil. They will also understand megasporogenesis. CO4: Students will understand pollination mechanism. They will understand the concept of Incompatibility. Plant Biotechnology After completion of this course - CO1: Students will get knowledge about importance of recombinant DNA technology for the production of vaccines. CO2: Students will have knowledge about creative genetically modified bacteria. CO3: Students will know about the use of computational approach to analyze, manage & store biological data. They are able to know, the use of information technology in biotechnology for data storage, Analyzing the DNA sequences. Economic Botany: All economic aspect of the plant world are included in this course. Plant as food, fodder, oil, vegetable ,medicine, spice , beverage, NWFP etc., their production and use included in it.

ZOOLOGY	
VISION	The holistic development of the students and make them able to contribute effectively for their welfare and society in today's era and to mould graduate into good naturalist and environmentalist.This helps students in getting a strong base and thus they can achieve great heights in future Learning zoology will help students to know more about the animals, their behaviour and environment in which they live,thus knowing about the nature
MISSION	To establish conductive atmosphere for the students to learn advances in zoology and life sciences

	To develop research aptitude and a scientific advancement To bring about an awareness regarding nature and biodiversity Reinvent ourselves in response to the changing demands of society with high moral value as a good citizen Develop empathy and love towards animals
GOAL	To make the students able to explain how organism's function at the level of gene genome cell tissue organ and organ system They will be able to identify the major groups of the organisms with an emphasis on animals and be able to classify them within a phylogenetic framework. They will be able to apply the scientific method to question in biology by formulating hypothesis gathering data that address thesehypothesisand analyzing those data to access the degree to which their scientific work support their hypothesis Apply the knowledge and understand zoology to one's on life and work Contribution of knowledge for nation building
COURSE OUTCOMES	The department of zoology was established in2003 in our college. Areas of specialization: fisheries science The faculty of department are dedicated and fully skilled. The department conduct various skill related classes for the students Students gain knowledge and skill in the fundamentals of animal science understand the complex interaction among various living organisms Analise the complex interactions among the various animals of different phyla their distribution and their relationship with the environment Apply the knowledge of internal structure of the cell, its functions in control of various metabolic functions of organisms and understand the complex evolution process Corelates the physiological process of animals and relationship of organ system Understanding of environmental conservation process and its importance p, pollution control, biodiversity and protection of endangered species Gain knowledge of agrobased small scaled industries like sericulture, apiculture, lac culture,fish farming, poultary farming

STATISTICS

VISION	• The expectation is that excellent training in Statistics will inspire rational decision making in all areas of social, commercial and scientific. • To provide high quality educational programs through adoption of different teaching methods and comprehensive programs in line with the community and labor market requirements.
MISSION	The mission of the department is to provide excellent training in scientific data collection, data management, methods and procedures of data analysis. The philosophy is to concentrate learning and training activities on the art of probabilistic reasoning, i.e. the logic and principles that should guide rational decision making under conditions of limited information and uncertainty. This philosophy equips our students with skills that all employers consider desirable.
GOAL	• To provide professional graduates and Post graduates in the field of statistics and conduct theoretical and practical studies in the field. • To allow students to participate in conduction of feasibility studies for program submitted to the department in order to acquire experience.
COURSE OUTCOMES	The department of Statistics was established in 2003 in our college. Areas of specialization: Demography The Course Outcome can be summarised as below: • Students will create quantitative models to solve real world problems in appropriate contexts. • Students will effectively use professional level technology tools to support the study of mathematics and statistics. • Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences. • They will recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines; be familiar with a variety of examples where mathematics or statistics helps accurately explain abstract or physical phenomena; • They will recognize and appreciate the connections between theory and applications; be able to independently read mathematical and statistical literature of various types, including survey articles, scholarly books, and online sources; and be life-long learners

	who are able to independently expand their mathematical or statistical expertise when needed, or for interest's sake.

ANTHROPOLOGY
Students Listening, Thinking and Answering with good response. Anthropology is a total science of human being its branches like social Anthropology, gives the knowledge of society its structure, components, ethics and values of human. It also gives the knowledge of material culture, Physical Anthropology gives the knowledge of evolution variation heredity and environment food and nutrition growth and development of human and different races of human. Prehistory an archeology gives the knowledge of ancient man, his culture, work and life style, new invention like fire and wheel. To study of different civilization of India and world. Forensic branch gives the knowledge of finger prints, palm prints ant its types. Blood group detection importance, value of RH factor to identify the criminal etc. To study of primitive culture and tribal communities. Anthropology can help to select the good sports persons. Anthropometry is used in different industries.

DEFENCE & STRATEGIC STUDIES
Department of Defence & Strategic Studies **Program Outcomes** • Attainment of sound knowledge about the basics that the students is expected to imbibe in the subject. • Having a clear understanding of the key concepts related to the subject along with their applications in real life situations. • Development of analytical skills so as to be able to appreciate the importance of the subject and spread its awareness. • Inculcate a spirit of nationalism and develop good values contributing to building strong national character. **Nature and Extent of Bachelor's Degree Programme in Defence and Strategic Studies** The approach to the study in the discipline is interdisciplinary as the subject broadly covers military history, war,

national security studies, international relations, peace and conflict studies, international terrorism, defence economics, military psychology/sociology and other aspects related to military or security of the nation and as such encompasses such aspects like geopolitics and military geography, science and technology, economics of defence, conflict management and conflict resolution, etc. The framework is intended to allow flexibility and innovation in programme design and syllabi development, teaching learning process and assessment of student learning levels.

Aims of the Bachelor's Degree in Defence and Strategic Studies

- Formulate qualitative description combining domain knowledge with gains from choice based credit system enabling students to qualify for jobs even outside the discipline demonstrating mobility of service.
- Instill the graduates skills, knowledge and abilities to understand national security issues analytically which to help the students to pick up adequate comprehension on matters security. Infuse each graduate with a desire to be a lifelong learner and plan to pursue professional courses related to Defence and Strategic Studies to be a domain specialist.
- Imbue an appreciation of one's civic duties and responsibilities towards society and demonstrate knowledge of contemporary or emerging threats, challenges or issues thereby contributing to strategic culture.
- Encourage leadership qualities amongst students and raise ability to work as a team.
- Demonstrate the ability to apply one's disciplinary knowledge and skills to new frontiers and be a partner ensuring global competitiveness.
- Undertake mechanism to periodically review of teaching programmes including adoption of teaching learning techniques.

Graduate Attributes in Defence and Strategic Studies

- **Disciplinary knowledge and skills:** Capable of demonstrating (i) comprehensive knowledge and understanding of major concepts, theoretical principles and contemporary strategic environment in Defence & Strategic Studies and its different subfields.

- **Skilled communicator and Critical thinker:** Ability to transmit complex information and ability to employ critical thinking relating to national security issues in a clear and concise manner in writing and oral skills.
- **Sense of inquiry:** Capability for asking relevant/appropriate questions relating to issues and problems in the field of Defence & Strategic Studies and planning, executing and reporting the results of any issues related to national/international security
- **Team player/Leader:** Capable of working effectively in diverse teams in both classroom, in society and real life situations.
- **Skilled project manager**: Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical conduct.
- **Digitally literate:** Capable of using computers to understand strategies and tactics in conflicts
- **Ethical awareness/reasoning:** Capable of embracing and demonstrating the ability to demonstrate moral/ ethical values in one's work and avoiding unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, and appreciate environmental and sustainability issues.

- **Lifelong learners:** Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and current affairs.

Programme Learning Outcomes relating to Bachelor's Degree Programme in Defence and Strategic Studies

I. Upon completion of the programme of Bachelor's in Defence and Strategic Studies, a student should have acquired basic competency in strategic affairs covering a wide spectrum of interstate security to global security issues including non kinetic dimensions.

II. Shall develop capability in understanding the implications of use and threat of use of force in International relations.

III. Shall seek, identify and apply the acquired knowledge in defence and strategic studies on

contemporary issues of strategic relevance.

IV. Ability to move from LOTS (Lower Order of Thinking Skills) to HOTS (Higher Order of Thinking Skills) in Defence and Strategic Studies.

V. The learning of strategic studies shall arm the candidates to independently choose further course of action in his/her life whether pursuing higher education by taking specialized course in honours or identifying a career for himself or herself.

VI. Course – Level Learning Outcomes - Learning Outcomes-Based Curriculum Framework (LOCF)is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience, each student should have achieved the goal. There is no single specified style of teaching or assessment in LOCF; instead, classes, opportunities, and assessments should all help students achieve the specified outcomes. The role of the faculty adapts into instructor, trainer, facilitator, and/or mentor based on the outcomes targeted.

VII. Some examples of course- level learning outcomes that a student of this course is required to demonstrate are indicated below:-

- **Clarity** The focus on outcomes creates a clear expectation of what needs to be accomplished by the end of the course. Students will understand what is expected of them and teachers will know what they need to teach during the course. Clarity is important over years of college and when team teaching is involved. Those designing and planning the curriculum are expected to work backwards once an outcome has been decided upon; they must determine what knowledge and skills will be required to reach the outcome
- **Flexibility** With a clear sense of what needs to be accomplished, instructors will be able to structure their lessons around the student's needs. LOCF does not specify a specific method of instruction, leaving instructors free to teach their students using any method. Instructors will also be able to recognize diversity among students by using various teaching and assessment techniques during their class.
- Knowledge Upon successful completion of this course, students will acquire an excellent knowledge of the biblical concepts taught in the epistle to the Colossians and will be familiar with major theological themes.
- Skills Upon successful completion of this course, students will be able to reflect critically on various New

Testament theological themes and issues and their contemporary relevance.

Discipline Specific Elective (DSE) – Some examples of course-level learning outcomes that a student of this course is required to demonstrate are indicated below:-

- Cyber risk is now firmly at the top of the international agenda as high-profile breaches raise fears that hack attacks and other security failures could endanger the global economy. The Global Risks 2015 report, published in January by the World Economic Forum (WEF), included this rather stark warning: "90 percent of companies worldwide recognize they are insufficiently prepared to protect themselves against [cyber attacks]." Therefore, The DSE paper `Cyber Security' will help the students understand that how cyber security is emerging a major threat to national security of a nation.
- Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object and thus in contrast to on-site observation, especially the Earth. Remote sensing is used in numerous fields, including geography, land surveying and most Earth Science disciplines and also has military, intelligence, commercial, economic, planning, and humanitarian applications. The paper `Remote Sensing and National Security' focuses on the national security issues in case of space war between nations.
- The paper ` Legal Aspects of International Security' is based on the International Law related to war and conflicts. A core component of international law is the law governing the use of force between states and the rules governing the conduct of hostilities. The area encompasses questions such as permissible use of force under the U.N. Charter, the scope and application of the Geneva Conventions; issues relating to peacekeeping and stability operations, conflict resolution, and post-conflict reconstruction; and legal responses to contemporary challenges, such as failing and fragile states, the proliferation of weapons of mass destruction, transnational crime, and terrorism.
- Terrorism is, in the broadest sense, the use of intentionally indiscriminate violence as a means to create terror among masses of people; or fear to achieve a religious or political aim. The increased use of suicide attacks from the 1980s onwards was typified by the September 11 attacks in New York City and Washington, D.C. in 2001. Therefore, This paper `International Terrorism' will acquaint students how

terrorism has become a global concern especially for India.

- The papers `WMD, Nuclear Proliferation and National Security' and `Defence Mechanism of Modern States' will be focusing on the risk of proliferation of nuclear weapons and how the defence mechanism require major changes in the war of 21st century. The majority of traditional concepts of war have become irrelevant and obsolete.
- The paper `Conflict Resolution and Peace Building' deals with various aspects of resolving conflicts and maintaining international peace and security. Various methods and techniques of conflict resolution and peace building will help them understanding the importance of peace. Besides, role of UN, NGO's and other agencies has also been included in this paper.

Generic Elective (Interdisciplinary) – Some examples of course-level learning outcomes that a student of this course is required to demonstrate are indicated below:-

- The choice based credit system not only offers opportunities and avenues to learn core subjects but also explore additional avenues of learning beyond the core subjects for holistic development of an individual. Choice based credit system (CBCS), in the layman's terms, is where the students can choose the prescribed courses, as the core, and elective or soft skill courses, from a range of options, rather than to simply consume what the curriculum offers. Therefore, a student enrolled for B.A./B.A. (Hons) in Defence and Strategic Studies will have the advantage of reading some Generic Elective (interdisciplinary) subjects also.
- The papers like `General Economics' will introduce them with the general principles of economics whereas `Military Sociology' not only acquaint them with the general sociology but also with sociological issues faced by the soldiers during the service as well after retirement and the problems of resettlement and rehabilitation after war. `International Relations' as discussed above will enable them to understand the basic issues of IR in the contemporary times.
- In this part `Functional Research Methodology' will help them understand the basic concepts of research enabling them to do research at higher level later. The issues of'Human Rights' have become so sensitive that various international Humanitarian Laws have been framed to protect the various basic human rights

in all the countries. Examples of rights and freedoms which are often thought of as human rights include civil and political rights, such as the right to life, liberty, and property, freedom of expression, pursuit of happiness and equality before the law; and social, cultural and economic rights, including the right to participate in science and culture, the right to work, and the right to education

- The potential of the Media in Conflict and post-conflict situations remains a net positive, and has been sadly underutilized to this point in time. Media and journalism can be a great assistance in conflict management and peace building. However, the power they have is also limited, as they will never be able to eliminate armed conflicts altogether. The media can be a good tool in a healthy and functioning environment but more is needed than ethical and responsible reporting to ensure lasting peace and safety.

Course outcome

1. A student should have acquired basic competency in strategic affairs covering a wide spectrum of interstate security to global security issues including non kinetic dimensions.
2. Shall develop capability in understanding the implications of use and threat of use of force in International relations.
3. Shall seek, identify and apply the acquired knowledge in defence and strategic studies on contemporary issues of strategic relevance.
4. Ability to move from LOTS (Lower Order of Thinking Skills) to HOTS (Higher Order of Thinking Skills) in Defence and Strategic Studies
5. The learning of strategic studies shall arm the candidates to independently choose further course of action in his/her life whether pursuing higher education by taking specialized course in honours or identifying a career for himself or herself.
6. The course curriculum in Defence and Strategic Studies is designed to encourage the acquisition of disciplinary/subject understanding, gain academic knowledge and professional skills required for any career pursuit be it choosing for higher studies or a job. The outcome based approach, particularly in the context of Defence and Strategic Studies for undergraduate programme will incorporate a significant shift from teachers centric to learner centric pedagogies and from specific to active/participatory pedagogies

where emphasis will be on field Study, educational tours, writing assignments, seminar presentation and Tutorials etc. Teaching, therefore, becomes more interesting and absorbing aiming at demonstrative learning.

7. **Educational Tours –** The visit to Defence institutions or defence related historical locations like forts and other archeological sites will provide the students with a firsthand experience of the topics of study and emphasize their importance and significance to the present world. Ship visits and a visit to view armaments that are open to public viewing like museums etc will provide a closer look at weapons that were used over the years and give an idea of evolution of arms and warfare in general.
8. **Field Study –** Taking up a small project on a related topic that could include collection of data through surveys or interviews could enhance communication skills of the students and enable them to propose a study subject and produce a report based on the data collected. This will form a vital part of the skill acquisition to undertake further research.
9. **Writing Assignments**- Since Defence & Strategic Studies would also entail extensive writing ability, practical training in writing essays, reports and favoring or opposing an argument or thesis, students must continuously be subjected to assignment writing so that they are well versed with the nuances of writing for a variety of purposes.
10. **Seminar Presentation –** Conducting seminars where student choose specific topics on which they research and present to an audience forms a vital part of developing skills of communication as well as organizing thought in a logical and cohesive manner. Every course teacher can utilize this technique to evoke interest in students on a particular topic or approach the same topic from a multiplicity of approaches.

Economics	
Vision	The department is committed to provide quality education to students, equip students with knowledge and skills and to provide opportunities for students to realize their full potential.
Mission	The mission of the Department is to impart the highest quality instruction to the students and to train students in the methods and ideas of economics.

Goal	The department of economics has following goals: ▪ Enabling students to develop a capacity to think like an economist ▪ Enabling students to understand how markets and economies operate ▪ Obtain statistical skills to be able to analyze economic issues and problems ▪ Be able to apply their knowledge of economics to problems of public policy
Course Outcomes	**UG Course(s):** 1. **Micro Economics**: After completing this course, students will be able to understand microeconomic concepts. 2. **Indian Economy:** This course will help the students to understand the structure of Indian economy and government programs and policies. 3. **Macro Economics:** This course will help the students to understand macroeconomic concepts. 4. **Money and Banking**: After completing this course, Students will be able to understand functions and role of money, financial system, how it operates, why it plays a central role in the economy. 5. **Public finance**: After completing this course, students will have the ability to describe the canons of taxation, differentiate between public finance and private finance, direct tax and indirect tax. Students will understand the fiscal policy and government budget. 6. **Statistical Methods for Economics**: After completing this course, students will have the ability to use statistical skills to test economic theories. 7. **Economic Development and Planning**: On the completion of this course, students will be able to understand how planning and infrastructural facilities can help an economy to grow. **PG Course(s)** 1. **Micro Economics**: After completing this course, students will be able to understand the behavior of individuals and small organizations, identify, compare and contrast micro economic theories. 2. **International Economics:** This course will help the students to understand the

	nature and theories of international trade, role of various international organizations. 3. **Quantitative Methods and Statistical Techniques:** This will help the students to use statistical tools in economic theories and economic modeling. 4. **Uttarakhand Economy:** This Course has been designed to understand the nature and structure of uttarakhand economy. 5. **Macro Economics:** This course will help the students to understand the aggregates and identify, compare and contrast macro economic theories. 6. **Economics of growth and Development:** This course will help students to understand the theories of growth and development, factors affecting development. 7. **Indian Economic Policy:** After completing this course, students will be able to understand Indian economy, national income, poverty, inequality, Indian financial system, economic reforms, LPG and basic socio-economic issues. 8. **Public Finance:** After completing this course students will be able to understand fiscal functions of government, taxation, public expenditure, public revenue, public debt and Indian fiscal policies and center-state financial relation in india. 9. **Monetary Economics:** This course will help the students to understand the evolution, role, functions demand for and supply of money. Students will have the ability to understand and analyze monetary forces and real forces, their developmental role and limitations in shaping and influencing the monetary policy. 10. **Research methodology:** After completing this course, students will have the ability to understand concepts and methodology of research, organize and conduct research in an appropriate manner. 11. **Agriculture Economics:** This course will help students to understand issues related to agricultural. 12. **Labour Economics:** This course will help students to understand issues related to labour market, wage theories employment policies and trade unions. 13. **Gender Economics:** On the completion of this course, students will be able to understand the issues related to gender. 14. **Computer Application in Economic Analysis:** After completing this course, students will be able to become familiar with basic knowledge of computer, use of software packages in analyzing data, obtaining results and presenting them in meaningful and interpretable form. 15. **Industrial Economics:** This course will help students to understand the role of industries in economic development, industrial profile, theories of industrial

	location, factors affecting industrial location, industrial finance, liberalization and globalization and its impacts on Indian industries. 16. **Economic Planning:** This course will help student to understand concepts of economic planning, planning techniques and Indian planning system. 17. **Economics of Human Development:** After completing this course, students will be able to understand the importance of human development, human development index and its indicators. 18. **Demography:** This course will help the students to understand demography through various analyses. Students will have the ability to understand demographic measurements. 19. **Economics of Co-operation:** This course will help students to understand history of co-operative movement, co-operative structure and various co-operative institutions. 20. **History of Economic Thought:** After completing this course, students will be able to understand the development of the theories of economics in the historical perspective. 21. **Econometrics:** After completing this course, students will be able to use statistical/econometric tools in economic theory and model.

HINDI

VISION

- To develop excellent proficiency in the Hindi language.
- To familiarize the students with the various modern trends in Hindi Literature.

MISSION

1. To develop the ability to use the language effectively for the purpose of practical communication and to make them think and express ideas, sentiments in the language.
2. To improve their reading and writing skill
3. To enhance their ability to communicate effectively and acquire the pronunciation of native speakers by means of spoken Hindi.
4. To strengthen student's ability to analyze, interpret and evaluate all forms of literary expression
5. To inculcate interest among students in the study of Hindi Literature, along with academic excellence.

POLITICAL SCIENCE	
Vision	The Political Science department seeks to provide students with a learning experience that will equip them to face the future challenges and prepare them to become active and engaged citizens at the local, national and international levels.
Mission	To create awareness of Democratic values and political rights among students. To teach Indian democratic values. To cultivating knowledge about Indian and Western Political Thinker.

Goal	Goals of Political Science Programme(s): 1. To spread the constitutional values like democracy, secularism, fraternity and equality among students. 2. Motivate to the students to appear for competitive examination. 3. Motivation of students towards value of vote.

Course Outcomes	UG Course(s): 1. **Political Theory:** (I) To understand definition, nature and scope of political science with reference to traditional behavioural and post behavioural perspective, relation with History, Economics, Sociology. (II) To understand definition, elements and nature of state and theories of origin of state and theories of functions of state (III) To understand concept of power, authority, influence and theories of sovereignty, Austin`s theory and pluralist criticism. (IV) To understand Liberty, Equality, Justice, Law, Citizenship, democracy, Liberalism and Marxism. 2. **Comparative Government and Politics:** (I) Understand the meaning, nature, scope and methods of Comparative Politics. (II) Understand political culture, role and classifications of political parties, pressure groups and public opinion. (III) Understand the analysis of the legislature, executive and judiciary of USA, UK, China and Switzerland. (IV) Understand the electoral system and theories of first past the post system, proportional representation and mixed system. (V) Understand socio economic basis of the constitution. 3. **Representative Political Thinkers:** (I) Understand the thoughts of Plato and theory of Justice, Communism, Ideal State. (II) Understand the Thoughts of Manu and theory of state, Justice and Penal system. (III) Understand the thoughts of Aristotle and these theories of

	State, Theory of Revolution, Classifications of Constitution and views on Citizenship and Slavery. (IV) Understand the thoughts of Kautilya and theory of Origin of State and it`s Organ, Judicial and Punishment System, Inter-state relations: the Mandal System and State. (V) Understand the thoughts of Aquinas on Law and Relation between Church and State. Machiavelli`s thoughts on Religion, Morality, State. Jean Boudin`s theory of Ideal State and Sovereignty. (VI) Understand the theory of Social Contract of Hobbes, Locke and Rousseau. (VII) Understand the Montesquieu`s theory of Separation of Power. Hegel`s Dialectical Method. Green`s concept of Liberty and Sovereignty. Karl Marx`s Principle of Dialectical Materialism, theory of Class Struggle and Social Revolution and theory of state. 4. **Indian Government and Politics:** (I) Understand the Development, Sources, Preamble and basic features of Indian Constitution. (II) Understand the Fundamental Rights, Fundamental Duties and Directive Principals of State Policy. (III) Understand the Union Government. ordinary and emergency powers of the President. Power and functions of the Prime Ministers. Organisation and Functions of the Parliament. Functions and Powers of Judiciary, Judicial Activism, NJAC verses Collegium System. (IV) Understand the State Government: power and function of the Executive and Legislature. State Judicial System. Nature of Indian federalism. Centre-State Relation. 73rd amendment and Panchayati Raj system.

(V) Understand the Functions and Powers of Election Commission of India, demerits of Indian election system. Electoral Reforms. Political Parties and Pressure Groups. Impact of Caste, Religion, regionalism and Language

5. **International Politics and Relations:**

(I) Understand the Definition, Scope, Nature and Relevance of International Politics. Development and Nature of international Relations. Approaches to International Relations- Idealism, Realism and System Approach.

(II) Understand the Definition and Elements of National Power, Balance of Power, Peace and Security.

(III) Understand the foreign Policy and It`s Objectives and determinants, National Interest, Role of the UNO in International Peace and Security. Regional Organisations: OAU, Aran League, ASEAN, BRICS, SARC, SCO and OPEC.

(IV) Understand the Cold War and it`s rise and decline, Emerging New World order, Disarmament. Non-Alignment Movement and it`s Relevance.

(V) Understand the Terrorism, Climate Change, Globalisation, Human Rights and Nuclear Proliferation.

6. **Elements of Public Administration:**

(I) Understand the Meaning, Nature and Scope of Public Administration. Various dimensions of Public Administration-Democratic Administration, development Administration, Public Administration and Private Administration.

(II) Understand the Meaning, Utility, Principles and Basis of Organisation. Staff, Line and Auxiliary Agencies, Boards and Commissions, Management, Planning and Public Relations.

(III) Understand the Personal Administration Recruitment of

Personal, Training, Promotion, Corruption in Public Services, Bureaucracy and Problems in Personal Administration.

(IV) Understand the Financial Administration: Budget and Budgetary Process, Parliamentary Control over Finance, Accounting and Audit. Understand the Rights and Duties of Comptroller and Auditor General.

(V) Understand the Administrative Control: Ombudsman, Lokpal and Lokayukta, Information Technology and Public Administration. Understand the District Municipal and Panchayat`s Administration in Uttarakhand. Understand the Major issues and challenges of Public Administration.

PG Course(s)

1. **Western Ancient and Medieval Political Thought:**

At the end of this course, students will be able to:

(I) Understand the thoughts of Plato and theory of Justice, Education, Communism and Ideal state.

(II) Understand the Thoughts of Aristotle and theory of Origin of state, Revolution, theory of Slavery, Justice and Classification of Governments.

(III) Understand the thoughts of St. Augustine and theory of Two Cities and Justice. Understand St. Thomas`s views on State and Church.

(IV) Understand the Political Ideas of Marsilio of Padua.

2. **Comparative Politics:** At the end of this course, students will be able to:

(I) Understand the meaning, nature, scope, evolution

	approaches of Comparative Politics. Understand the Political Culture and Political development. **(II)** Understand the concept of Political System and Structural-Functional Approach. **(III)** Understand the Forms of Political System: Federal verse Unitary system, Separation of Powers, Checks and Balances and Judicial Review. **(IV)** Understand the Representation and theories of representation, proportional Representation. Understand the Public Opinion and Mass Media. 3. **Indian Political System**: At the end of this course, students will be able to: (I) Understand background, Composition, and working of Constituent Assembly of India, Ideological basis of Indian Constitution; Preamble, Fundamental Rights and directive Principles of State policy. (II) Understand the nature of Indian federalism and Centre State relations. (III) Understand the structure and functions of Parliament. Union executive: President, Prime Minister, The Judicial system: Supreme Court, Judicial Review, Judicial Activism. (IV) Understand the Election Commission and Electoral Reforms. **4. Local Self Government in India:** At the end of this course, students will be able to: (I) Understand the Concept of Local Self Government and it`s Meaning and Importance, Brief history during British Period and after Independence. (II) Understand 73rd& &4th Amendments.

(III) Understand Urban Local Government: Municipalities and Municipal corporation.

(IV) Understand achievements of Panchayati Raj system.

5. **Western Modern Political Thought:**

At the end of this course, students will be able to:

(I) Understand the thoughts of Machiavelli and theory of Statecraft and Separation of Ethics from politics. Understand Jean Boudin`s Concept of Sovereignty.

(II) Comparative study of Hobbes, Locke and Rousseau, understand the thoughts of Jeremy Bentham and theory of Utilitarianism, Political and Legal reforms and J.S. Mill`s view on Liberty.

(III) Understand the thoughts of T.H. Green and Views on Liberty, Rights and State. Understand the thoughts of Karl Marx and theory of Dialectical Materialism, Class Struggle and Theory of State.

6. **Modern Political systems (UK-USA-CHINA-FRANCE):**

At the end of this course, students will be able to:

(I) Understand the Typology of Political Systems: Written-Unwritten, Flexible-Rigid, Presidential-Parliamentary; Rule of Law- Administrative law with reference to India, U.S., U.K. and China.

(II) Understand the French Political system: The Presidency, Executive and Judiciary.

	(III) Understand the Chinese Constitutional framework: Executive, Legislature, and Role of Communist Party. 7. **India`s foreign Policy:** **(I)** Understand the India`s foreign Policy and it`s Principles, Objectives and Determinants. **(II)** Understand India in World Politics and it`s Relation with USA, Russia and china. **(III)** Understand India`s Foreign Policy and its Neighbours: Pakistan, Nepal, Bangladesh and Sri Lanka. **(IV)** Understand India`s Nuclear Policy and Emerging Challenges to Indian foreign Policy. 8. **Research Methodology:** At the end of this course, students will be able to: (I) Understand Research Methodology and it`s meaning and relevance, Scientific method and main steps of Scientific Method. (II) Understand Selection and Formulation of research Problem. (III) Understand Hypothesis, Research design, Techniques of Data collection- Observation, Interview, Questionnaire and Schedule Method. (IV) Understand Sampling and it`s meaning and Types, Introduction to Statistics, Data Processing and Thesis Writing. 9. **Indian Political Thought**: At the end of this course, students will be able to:

(I) Understand Indian Political Thought and it`s Genesis, Development and The Indian Renaissance.

(II) Understand the Thoughts of Ram Mohan Roy, Gopal Krishna Gokhale and Bal Gangadhar Tilak.

(III) Understand the thoughts of Sir Syed Ahmed Khan, V.D. Savarkar and M.K Gandhi.

(IV) Understand Political Ideas of of Jawahar Lal Nehru, B.R. Ambedkar and J.P. Narayana.

10. **International Relations:** At the end of this course, students will be able to:

(I) Understand International Relation and it`s meaning, definition and Development and Idealistic and Realistic theory.

(II) Understand Balance of Power and it`s Meaning and Relevance, Collective Security and Disarmament.

(III) Understand Regional Organisations: SARC and ASEAN.

(IV) Understand Various discourses in Globalization and and issue of Terrorism.

11. **Theories of International Politics:**

On completion of this course, the students will be able to:

(I) Understand International Politics and it`s definition, nature, scope and development.

(II) Understand approaches and methods of international politics.

(III) Understand national power, national interest and ideology.

(IV) Understand foreign policy and diplomacy. Learn role of no-state actors in international relations.

12. **International Law:** On completion of this course, the students will be able to:

(I) Understand the International Law and it`s meaning, nature, relation with municipal law and sources of international law.

(II) Understand subjects of International Law: Diplomatic

	Envoys, Extradition and Asylum. **(III)** Understand settlement of disputes: Amicable and Compulsive Means **(IV)** Understand the War and it`s consequences and termination, War Crime, Neutrality, Blockade and Contraband. 13. **Political Philosophy of Mahatma Gandhi:** At the end of this course, the students will be able to: (I) Understand Influence on Gandhi and Gandhiji`s conception of The end and means. (II) Understand the Truth, Non- violence and Satyagrah. (III) Understand the Social ideas, Political ideas and Economic ideas. (IV) Understand contribution and relevance of Gandhi. 14. **Human Rights**: At the end of this course, the students will be able to: (I) Understand meaning, nature, significance and development of Human Rights. (II) Understand the U.N. charter and declaration of Human Rights. (III) Understand the organisation, structure, functions and powers of national human rights commission. (IV) Understand the Non-State Actors: Amnesty International, Asia Watch and Green Piece. 15. **Modern Political Analysis**: On completion of this course, the students will be able to: (I) Learn nature and approaches of Political Science and growth of political science as a discipline. (II) Learn the behavioural and post behavioural revolution in political science. (III) Understand the end of ideology and it`s rise and decline of political theory. (IV) Understand the existentialism, feminism, environmentalism, and

	green politics. 16. **Politics of Environment and Development**: At the end of this course, the students will be able to: (I) Understand the Environment and Development and it`s meaning, definition and problems and changing concepts of development and sustainable development. (II) Understand environment and conflict of resources: forests, biodiversity and protected areas. (III) Understand poverty, social backwardness and disparities and social movements. (IV) Understand climate change and it`s impact on development and understand environment protection. 17.

HISTORY
Identify the significance of key ideas and issues, periods and people, events and movements in world history.Locate historical and scholarly sources using electronic and print media. Analyze and evaluate primary and secondary sources.Communicate effectively through polished narrative, persuasive, and analytical writing and presentations.Demonstrate an understanding of the range of careers and contributions beyond the classroom that draw on the skills and knowledge developed through historical study.

HOME SCIENCE	
Vision	The department envisions to give the students an insight into the practical, scientific, economic, social aspects of running a home and also mindset to work out solutions to problems encountered in their lives.
Mission	The overall mission of the Home Science Department is 1. To empower and develop an appreciation for rural life in a holistic manner. 2. To achieve an efficient use of human and non-human resources in every day living. 3. To acquire stress management strategies. 4. To provide knowledge of child development, needs of special children and help them to impart this knowledge to less privileged ones. 5. To develop a functional scientific attitude towards extension education and to transfer it for family living. 6. To make them know nutritional benefits of different target groups. 7. To develop an eye on decoration, fashion designing and garment making. 8. To know about the values and goals of marriage in family life and to develop better human relations. 9. To enhance entrepreneur skills for professional careers. 10. Provide quality education and at the same time inculcate a spirit of service and dedication.
Goal	• To provide maximum opportunities available in all the five disciplines of home science to equip the students in becoming self-sufficient in skills and self-reliable. • To encourage students for higher education in home science disciplines and improve their quality of living.
Course Outcomes	**U.G. Course(s):** 1. **Resource Management:** Comprehend the fundamentals of resource management in changing scenarios. Inculcate skills in the identification, creation, selection and judicious use of available resources with emphasis on maximization and conservation. Understand the processes of management in a scientific manner in the use of resources.

	2. **Introduction to Textiles:** Describe textile fibres in terms of their production and properties. Understand various production techniques and properties of yarns. Identify fabrics and relate it to specific products keeping in mind fabric properties and characteristics. Understand various dyeing, printing and finishing techniques. 3. **Human Development:** Demonstrate understanding and knowledge of development during the human life-span from conception to middle childhood. Gain knowledge to locate relevant examples of development in the cultural context, focusing on situatedness of childhood development in Indian culture. Competent in using methods to study development in children, and explore family and community context of Indian children. 4. **Food and nutrition:** Understand the relationship between food, nutrition and health Understand the function of food. Understand various food groups and balanced diet and principles of meal planning. Understand digestion, absorption and function of various nutrients and their sources. Develop understanding about the methods of preparing food. 5. **Interior design and decoration:** Comprehend the nuances of design with focus of interiors. Proficient in working and presentation drawing to be used as a design professional. Understand the use of various materials and finishes to create aesthetically designed interiors. 6. **Housing:** Understand the role of housing in integrated development. To study landscape designing and its application. **P.G. Course(s):** 1) **Theories of Human Development:** Understand classical and contemporary theoretical perspectives in human development. Apply theoretical understanding of core concepts in human development to the everyday context. 2) **Dynamics of communication and extension:** Develop understanding of the concept of human communication and its components. Learn the concept of extension and its interrelationship with communication.

	Understand the various tools and techniques in the process of communication. Develop skills in preparation, presentation and evolution of select methods and media. 3) **Research methodology in home science:** Sharpen competence in research approaches. Acquire research acumen for any basic and advanced research. Comprehend the purpose and procedure of research study. 4) **Food Science:** Understand the basic concepts of food science and its applications in processing of food. Gain coherent and systematic knowledge of basic food chemistry. Understand the role of microorganisms in relation to processing and spoilage. Impart knowledge about the national and international food laws. Perform basic sensory and objective evolution of food. 5) **Human Development II:** Demonstrates understanding and knowledge of development during the human lifespan, from adolescence to late adulthood. Gain knowledge to locate and use relevant cultural examples of development during adolescence and different phases of adulthood. Competent in using methods to study development and socio-cultural context of Indian adolescence and adults. 6) **Early childhood care and education:** Understand early childhood care and education in India. Comprehend model child development programs in the Indian context. Understand planning and creating development and programmatic activities for children in the first six years of life. 7) **Technology of Food Preservation:** Comprehended the important microorganisms in food preservation. Comprehended the basics of various food processing and preservation technologies. 8) **Traditional Indian textiles:** Identify and compare embroidered fabrics of different states. Explain construction and design of select traditional woven fabrics. Describe our heritage of varied diet, painted and printed fabrics. Provide an insight into the evolution and socio economic significance of khaadi, handloom and handicrafts sector. Discuss sustenance of traditional textile craft and interventions by organization. 9) **Children with disabilities:** Demonstrate understanding and knowledge of the

	etiology and social demography of a wide range of childhood disabilities. Skills in assessment and evolution processes associated with identification of childhood disabilities, therapy and inclusive education. Contribute towards the study and dissemination of information related to issues of disability advocacy and inclusion. **10) Therapeutic nutrition:** Understand principles of nutrition care Modify the normal diet for therapeutic purposes. Understand the etiology, clinical features and dietary management in some common disorders/diseases. Understand the significance of dietary counseling. **11) Textile design:** Describe fabric manipulation methods. Identify different methods of surface decoration. Explore designing through color application. Indicate thread structure in textile designing. **12) Processes in apparel design:** Recognize the skills used in pattern making and construction. Explain the preparatory steps involved in garment construction. Understand the use of components of a garment. Comprehend the concept of fit and designing for different figure types. **13) Clothing construction:** Recall the use of various pattern making tools and its terminology. Apply the principles of pattern making for basic upper and lower sloper, sleeves, collars, and dresses. Develop the basic bodice and skirt slopers by applying the technique of draping. **14) Community nutrition:** Understand the multi-faceted nature of nutritional problems Gain knowledge about techniques of assessment of nutritional status. Be familiar with the policy and intervention programs operating in India to overcome malnutrition.

GEOGRAPHY

Vision	To develop the minds of the students to think globally and act locally. Glocal is the need of the hour.
Mission	To train the minds of U.G and P.G students to observe, interpret and analyse the Geography of the area they inhabit and also they must develop the tendency to explore through various audio, visiual aids, books, E-books etc. They have to be career oriented and must do the needful to achieve their aims.
Goal	01. The student should have basic, fundamental and specialized knowledge of the subject they study. 02. Students should be very clear about the opportunities Geography offers in their individual growth in terms of personality development and careers. 03. They should be useful to the society at large as an individual.
Course Outcomes	UG Course(s): 01. As a U.G student they study various branches of Geography, the basic purpose is to introduce them to specialised learning of various branches of Geography.

	02. Specialised studies of these branches will help them in better understanding of these fields and this will help them in choosing their area of interest of branch for P.G Courses . 03. They would become more sensitive to the environment in which they live and would gradually become sensitive for its sustainable growth . PG Course(s) 01. Papers in P.G courses introduce a student to more indepth study of Geography . 02. They are introduced to applied Geography-field studies, Cartography dissertation etc. and introduce them to the basic and technical aspect of Geography. 03. They now interact with the society to collect information, Questionnaires, schedules, interviews etc. are taken by them in preparing their project work and dissertation. 04. In Depth study of the topic chosen by them is done . Use of Geographical tools is made use by them for e.g. map making, use of graphs, statistics etc. This widens their horizon and approach towards their subject and life in general . 05. They are being trained for their future life .

Commerce	
Vision	To be able to provide students with knowledge to equip them with necessary skill set to make them employable.
Mission	Mission of UG and PG Commerce Programmes is to equip students with practical and hands on informationso that they can find employment as per industry requirements. The student(s) can be self-employed or gain basic employment as accountants, tax consultants

	etc. They gain in depth knowledge of marketing, finance HRM, tax etc.
Goal	Goals of Commerce Programme(s): Produce professionals, who will: 1. Be graduates and post graduates with some ready employability skills 2. Develop analytical skills and problem-solving skills 3. Generate self-employment opportunities
Course Outcomes	**UG Course(s):** 1. **Law :** After completing this course, student(s) will be able to define the concepts of mercantilism, differentiate and understand the nuances of agreement and contract, why contracts are formed, form basic understanding of sale of goods act, negotiable instrument act, the need of business law and its working, industrial law and its utility etc 2. **Marketing:** After completing this course, student(s) will be able to understand the meaning and functioning of markets, its components etc. How big corporations use marketing strategies to commercialize their ventures. 3. **HRM:** On completion of this course, student(s) will be able to understand the concept, importance and value of human resources. It would help them in gaining a deep insight into why HRM has become an indispensable part of every organisation. 4. **Finance:** On completion of this course, student(s) will understand the basic properties of finance function. They would be exposed to different theories of finance, the classical vs the modern concept and also how the world is driven through finance with practical explanations. 5. **Accounts:** In this course students will be able to develop the understanding that the language of commerce is accounts. They would understand the nuances of various branches of accounting and its relevance and importance to companies. **PG Course(s)** 1. **Law :** After completing this course, student(s) will be able to define the concepts of mercantilism, differentiate and understand the nuances of agreement and contract, why contracts are formed, form basic understanding of sale of goods act, negotiable instrument act, the need of business law and its working, industrial law and its utility etc 2. **Marketing:** After completing this course, student(s) will be able to understand the

	meaning and functioning of markets, its components etc. How big corporations use marketing strategies to commercialize their ventures. 3. **HRM:** On completion of this course, student(s) will be able to understand the concept, importance and value of human resources. It would help them in gaining a deep insight into why HRM has become an indispensable part of every organisation. 4. **Finance:** On completion of this course, student(s) will understand the basic properties of finance function. They would be exposed to different theories of finance, the classical vs the modern concept and also how the world is driven through finance with practical explanations. 5. **Accounts:** In this course students will be able to develop the understanding that the language of commerce is accounts. They would understand the nuances of various brances of accounting and its relevance and importance to companies. a.