SRI VENKATESWARA COLLEGE
(University of Delhi)
Managed by Tirumala Tirupati Devasthanam (TTD)
NAAC Accredited "A+" Grade (2022)

Benito Juarez Road
Dhaula Kuan, New Delhi -110021
Phone: 91 11-24118590
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Program outcomes (POs), Program Specific Outcomes (PSOs) and Course Outcomes (COs) for all Undergraduate courses offered by Sri Venkateswara College

Program Outcomes are a set of statements that provide information about the contents, scope and competencies expected to be developed for a particular course of study or program offered by an Institution. This clarity helps the teacher to plan and execute content-delivery in an efficient manner. while the learner (student) is made aware of the standards that he/she is expected to attain. Being a constituent college of University of Delhi (DU), Sri Venkateswara College follows the syllabus as prescribed by the University of Delhi. Programme Specific Outcomes (PSOs) for the courses offered provide information about the knowledge and skills that would be expected to be possessed by a student, in a particular subject, upon the completion of a undergraduate program. The PSOs and POs are communicated to students at the commencement of every semester.

In order to develop clear academic goals, University of Delhi has made it mandatory to formulate Course Outcomes (COs) describing what every student should be able to attain at the end of any particular course. The COs has been developed in consultation with Head of Department, teachers, students and other stakeholders. The CO is also communicated by respective faculty to the students at the commencement of the course.

The POs, PSOs and COs, as included in the undergraduate syllabus are also uploaded on the College website for wider dissemination and ease of access. This exercise has been undertaken for all courses of the Old Courses, CBCS and the LOCF, and the New Course (UGCF) effective from 2022-23.

प्राचार्य
Principal
श्री वेंकटेश्वर महाविद्यालय
Sri Venkateswara College
दिल्ली विश्वविद्यालय / University of Delhi
धौला कुआँ, नई दिल्ली / Dhaula Kuan, New Delhi-21

Prof. Vajala Ravi
Principal

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Courses Offered by Sri Venkateswara College
List of Undergraduate Courses

S. No.	NAME OF THE UNDERGRADUATE COURSE
1	B.Sc. (Hons) Biochemistry
2	B.Sc. (Hons) Biological Sciences
3	B.Sc. (Hons) Botany
4	B.Sc. (Hons) Chemistry
5	B. Com (Hons)
6	B.A (Hons) Economics
7	B.Sc. (Hons) Electronics
8	B.A. (Hons) English
9	B.A (Hons) Hindi
10	B.A (Hons) History
11	B.Sc. (Hons) Mathematics
12	B.Sc. (Hons) Physics
13	B.A (Hons) Political Science
14	B.A (Hons) Sanskrit
15	B.A (Hons) Sociology
16	B.Sc. (Hons) Statistics
17	B.Sc. (Hons) Zoology
18	B.A Program
19	B. Com (Programme)
20	B.Sc. (Prog) Life Science

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SRI VENKATESWARA COLLEGE
(University of Delhi)

Program Learning Outcomes (POs), Program Specific Outcomes (PSOs) & Course Outcomes (COs) of UG Courses under NEP-UGCF, 2022 for 1st and 2nd Semester.

1. COURSE: B.SC. (HONS.) BIOCHEMISTRY

DEPARTMENT: BIOCHEMISTRY

Programme Learning Outcomes (POs)

The curriculum is designed to achieve the following outcomes:

PO1: Inculcate the basic concepts of biochemistry including an understanding of the fundamental biochemical principles and their applications in a systematic, methodical, scientific, evidence-based process. The programme will also provide a general understanding of the related disciplines with a holistic knowledge generation in biological sciences.

PO2: Develop problem solving and analytical skills through case studies, research papers and hands-on-experience, especially integrated into skill enhancement courses.

PO3: Students will gain proficiency in basic laboratory techniques and be able to apply the scientific method to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.

PO4: Provide requisite knowledge of laboratory safety, data replication and quality control, record keeping and other aspects of "responsible conduct of research".

PO5: Ability to employ modern library search tools to locate and retrieve primary literature on a topic and critically evaluate the literature.

PO6: Students will be able to apply and effectively communicate scientific reasoning and data analysis in both written and oral forms. They will be able to communicate effectively with well-designed posters and slides in talks aimed at scientific audiences as well as the general public.

PO7: Students will learn to work collaboratively in a team.

PO8: Students will gain knowledge of ethical and good laboratory practices, health and biohazard regulations, plagiarism and intellectual property rights related issues practiced in modern era of scientific investigation.

PO9: Graduates will be able to apply the major theories and research procedures to contemporary societal issues.

P10: The programme will prepare students to plunge into various fields of higher education or related profession in various disciplines, armed with plethora of knowledge, hands-on-experience and scientific attitude, at national and global levels.

Program Specific Outcome (PSO)

Provide students with scholarly experiences, both theoretical and hands-on, that help in still deep interests in learning the chemistry underlying the working of biological systems while developing broad and balanced knowledge and understanding of key biological concepts, principles and theories. The idea is to equip students with appropriate tools of analysis so that they can independently tackle issues and problems in the field of biology and chemistry.

- Encourage students to study the structure and function of specific molecules and pathways and their interactions and networking in biological systems with particular emphasis on regulation of chemical reactions in living cells.
- Develop in students an inquisitive learning approach to seek answers regarding the complex workings of various physiological systems, cellular multiplication and differentiation and communication within and between cells and organs, and the chemical bases of inheritance and disease.
- Empower students to apply the knowledge and skills they have acquired to the solution of specific theoretical and applied problems in Biochemistry.
- Build concepts in biochemistry that would enable them to undertake further studies in Biochemistry and related areas or in multidisciplinary areas and help develop a range of generic skills that are relevant to wage employment, self-employment and entrepreneurship.

Course Outcomes: B.Sc. (Hons.) Biochemistry (NEP UGCF-2022)

Core Course(s) 1st Year

BCH-DSC-101: BIOMOLECULES (SEMESTER – I)

On successful completion of the course students will be:

- Able to comprehend the structure, function and acid base properties of amino acids.
- Introduced to the structure, properties and roles of carbohydrates, lipids and nucleic acids.
- Aware of the importance of vitamins in biological systems.

- Able to independently identify various biomolecules in the laboratory by qualitative test methods.
- Acquainted with chemical and molecular foundations of life and appreciate the role of buffer in biological systems.

BCH-DSC-102: PROTEINS (Semester – I)

After completion of the course, a student will

- Understand the diverse functions of proteins in a cell.
- Understand the hierarchy of protein architecture – primary, secondary, tertiary & quaternary structure, with the ability to distinguish features of globular & fibrous proteins.
- Be able to comprehend the fundamental mechanisms of protein folding and stabilityand their relation to conformational diseases.
- Understand specialized proteins like structural proteins.
- Gain comprehension of structure-function relationship of proteins and their significance in physiology, diseases and applications in industry and medicine.

BCH-DSC-103: BIOCHEMICAL TECHNIQUES (Semester – I)

- Acquire knowledge about the principles and applications of spectrophotometric and chromatographic techniques used in a biochemistry lab.
- Learn about the principle and applications of electrophoresis and centrifugation techniques.
- Students will obtain hands-on experience to develop their experimental skills expected from any biochemistry student working in a research lab.

BCH-DSC-201: ENZYMES (Semester – II)

- Students will learn the nature and importance of enzymes in living systems.
- Students will gain insight into the thermodynamic and molecular basis of catalysis by enzymes and the underlying basis of their specificity.
- Students will understand the mechanisms of enzyme action, kinetics of enzyme catalyzed reactions and clinical importance of enzyme inhibitors.
- Students will also learn to appreciate how enzymes are regulated and the physiological importance of enzyme regulation in the cell.

- The course will introduce students to the applications of enzymes in research and medicine as well as in industry, which will bolster their foray into industrial and biomedical research.

BCH-DSC-202: METABOLISM OF CARBOHYDRATES (Semester – II)

Carbohydrates major biomolecules as building blocks in any organism. An understanding of the metabolism of these groups of molecules will help students to know the functioning of an organism, as a whole. There are various degradation and synthesis pathways these molecules undergo based on the energy requirement of an organism so as to maintain body homeostasis. Detailed analysis of the pathways will provide an insight into the diseases caused by defects in metabolism highlighting the importance of the same. The metabolism of carbohydrate course will provide to undergraduate students:

- Concept of metabolism, characteristics of metabolic pathways and strategies used to study these pathways.
- Detailed knowledge of various pathways involved in carbohydrate metabolism with the enzyme involved and regulation.
- Diseases caused by defects in metabolism with emphasis on the metabolic control and cure of diseases.
- Understanding of various metabolic pathways in animals.

BCH-DSC-203: CELL BIOLOGY (Semester – II)

After the completion of the course, the students will have:

- Insights into the basic structure and function of the cell and cellular organelles.
- Introduction to the concept of model systems, cell division and cell to cell interaction.
- Understanding of the structural framework of the cell as cytoskeletal structures.
- Knowledge of various techniques used in cell biology experiments.

Generic Elective Course(s) (GE) (Common Pool)

BCH-GE-1: MOLECULES OF LIFE (Semester I)

- The course will provide an understanding of how the structure of biomolecules determine their chemical properties and functions.
- Students will develop understanding of biochemistry at atomic level and appreciate the biological importance of each biomolecule.

- Students will gain insight into basic structures, classification, chemistry and properties of amino acids, carbohydrates, lipids and nucleic acid along with their biological role.
- Students will learn about the nutritional roles of water soluble and lipid soluble vitamins in the body along with their occurrence.

BCH-GE-2: TECHNIQUES IN BIOCHEMISTRY (Semester II)

- Students will acquire knowledge about the principles and applications of spectrophotometric and chromatographic techniques used in a biochemistry laboratory.
- Students will learn about the principles and applications of centrifugation and electrophoresis.
- It will also give them an opportunity to get hands-on experience to develop their experimental skills expected from any student working in a research lab.

Skill Enhancement Course (SEC) (Common Pool)

SEC 1: PERSONALITY DEVELOPMENT AND COMMUNICATION (Semester-I)

- After studying this course, students will be able to understand the importance of oral and written communication in day-to-day working of an organisation.
- They will be able to develop interpersonal skills and problem solving skills.
- They will be able to understand the role of body language in effective communication.

SEC 2: ESSENTIAL FOOD NUTRIENTS (Semester-II)

- After studying this course, the student will be able to:
- Account for chemistry of foods: composition of food, role of each component
- Recognize some of the reactions and changes in individual food components which occur during processing, handling and storage

Value Addition Course(s) (VAC) (Common Pool)

VAC1: AYURVEDA AND NUTRITION (Semester-I)

- Awareness of traditional food cultures of India
- Evaluate changing food patterns and lifestyle over the years
- Understand Indian Knowledge Systems (IKS) and key vedic principles with respect

to Food and Nutrition.

- Apply basic tenets of traditional diets for health and disease
- Prepare selected healthy recipes based on Ayurvedic principles

VAC2: THE ART OF BEING HAPPY (Semester-II)

- The students shall be able to evaluate the factors contributing to the phenomenon of happiness in the personal, familial and community life of an individual in different cultures in the Indian context
- They will be able to develop healthy interpersonal relationships and well-being cherishing the values of Indian culture and philosophy
- They will be able to relate the global phenomenon of sustainable development and become sensitive to the needs of the planet.
- They will be able to apply the experience of Aananda at a personal level.

Core Course(s) 2nd Year

DSC-7: Metabolism of Lipids (Semester – III)

On successful completion of the course, students will be:

- Explain the concepts of metabolism of lipids, characteristics of metabolic pathways and strategies used to study these pathways.
- Apply the knowledge of various catabolic and anabolic pathways in lipid metabolism and their regulation. They will be able to appreciate the importance of ketone bodies as an alternate fuel.
- Introduced to digestion absorption, we will gain conceptual clarity on the functions of lipoproteins and the transport of lipids.
- Describe the diseases caused by defects in metabolism with emphasis on metabolic control.

DSC-8: Bioenergetics (Semester – III)

After completion of the course, a student will

- Understand the basic principles of thermodynamics and the meaning of standard free energy changes of reactions.
- Learn about redox reactions, reduction potentials, standard reduction potential, and their relationship with standard free energy change.

- Understand the concept of chemiosmotic theory and the mechanism of oxidative phosphorylation and ATP synthesis.
- Understand the basic mechanisms of photophosphorylation in plants and microbes.

DSC-9: Membrane Biology (Semester – III)

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

- Learn about the general composition and structure of bio membranes. They would study various membrane model systems and their application. Learn about lipid shapes and Polymorphic Lipid-Water Systems.
- Learn about membrane dynamics and various techniques used to study membrane dynamics.
- Would know the various types of membrane transport mechanisms.
- Learn about molecular mechanisms of vesicular transport and membrane fusion.

DSC-10: Metabolism of Amino Acids and Nucleotides (Semester – IV)

After completion of the course, a student will

- Explain the importance of the nitrogen cycle.
- Explain the degradation and biosynthetic pathways of amino acids and nucleotides in
- humans.
- Discuss the importance of amino acids as precursors to a variety of important
- biomolecules.
- Examine the role of inhibitors of nucleotide metabolism as chemotherapeutic drugs.
- Discuss the integration of the amino acid, nucleotide, carbohydrate and lipid metabolism.

DSC-11: Hormones: Biochemistry and function (Semester – IV)

The Hormones: Biochemistry and Function course will provide to undergraduate students:

- Explain the molecular mechanism and signalling pathways mediating Hormone Action
- Describe the physiological role of each hormone in regulating growth, appetite,
- metabolism and reproduction
- Examine the regulatory mechanisms regulating Hormone secretion and release.
- Discuss the basis of endocrine diseases, taking case studies.

DSC-12: Gene Organization, Replication and Repair (Semester – IV)

After the completion of the course, the students will have:

- Analyse the structure of DNA and various forms of DNA and learn about the organisation of genome across multiple life forms, supercoiling of DNA and its significance
- Perform isolation of DNA and analyse the purity of isolated DNA sample
- Evaluate the molecular basis of processes like DNA replication, recombination, and transposition and demonstrate the significance of these processes
- Perform various methods of DNA estimation
- Discuss how the DNA can be damaged, leading to mutations, lesions and repair mechanisms.

Discipline Specific Elective Course(s) (DSE)

DSE-1: Biochemical Applications in Forensic Sciences (Semester III)

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

- Describe the fundamental concepts and principles of forensic science and their significance.
- Explain how a forensic investigation is initiated through the preservation of evidence and chemical, physical and biological methods of their analysis.
- Identity an individual by document evaluation, fingerprints, footprints, and DNA analysis. Identify the accurate age, sex, and identity of an individual and identify the time and cause of death in a forensic investigation.
- Explain the importance of precision, reproducibility and accuracy in identifying a biological sample.
- Elaborate on the methods used to analyse samples for drug testing, ink and stain testing and document and handwriting verification.
- Describe the physiology and biochemistry behind tests like Narco Analysis, polygraphy, lie detection and facial reconstruction.
- Apply the knowledge gained from hands-on experience in some of the basic biochemical processes of forensic investigation.

DSE-2: Nutritional Biochemistry (Semester IV)

After the completion of the course, the students will have:

- Critically analyse and evaluate concepts in nutritional biochemistry that are important for understanding human nutrition.
- Demonstrate the relationship between nutrition and health.

- Discuss the macro and micronutrients and their nutritional deficiencies.
- Describe techniques used in the assessment of nutritional status and nutritional disorders.
- Explain drug-nutrient interactions.

Generic Elective Course(s) (GE) (Common Pool)

GE-3: Physiology of Sports and Exercise (Semester III)

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

- Explain the effect of exercise in detail and from an application perspective.
- Measure the changes and interpret them in the context of sports.
- Describe the system concepts behind sports performance.
- Explain how the human body functions during exercise and thus provide appropriate nutrition/fuel.

GE-4: Biochemical Correlation of Diseases **(Semester IV)**

After the completion of the course, the students will have:

- Discuss the importance of a balanced diet, regular exercise and a healthy lifestyle in
- leading a disease-free life.
- Explain the functioning of the immune system and endocrine system and the basis of
- various autoimmune and hormonal disorders.
- Correlate genetic mutation and metabolic disorders.
- Discuss the molecular mechanism of microbial pathogenicity, drug resistance, and implications for public health management.

Skill Enhancement Course (SEC) (Common Pool)

SEC 3: Basics of Food Science and Nutrition (Semester III)

On successful completion of the course, students will be:

- Analyse and evaluate concepts in human nutrition and its relation with food and health
- Understand the concept of food exchange and meal planning
- Understand the essentiality of macro and micronutrients in food items
- Assess the quality and nutritive value of food.

SEC 4: Food Waste and By-product Utilisation (Semester-IV)

After studying this course, the student will be able to

- Identify waste produced from different sectors of the food industry.
- Utilise waste from the food industry.
- Understand wastewater treatment.

Value Addition Course(s) (VAC) (Common Pool)

VAC3: Ayurveda and Nutrition (Semester-III)

After completion of the course, the students will be able to -

- Aware of traditional food cultures of India.
- Evaluate changing food patterns and lifestyles over the years.
- Understand Indian Knowledge Systems (IKS) and fundamental Vedic principles concerning Food and Nutrition.
- Apply basic tenets of traditional diets for health and disease
- Prepare selected healthy recipes based on Ayurvedic principles.

VAC4: THE ART OF BEING HAPPY (Semester-IV)

- The students shall be able to evaluate the factors contributing to the phenomenon. They will be able to apply the experience of Ananda to the personal, familial, and community life of an individual in different cultures in the Indian context.
- They will be able to develop healthy interpersonal relationships and well-being, cherishing the values of Indian culture and philosophy.
- They will be able to relate to the global phenomenon of sustainable development and become sensitive to the needs of the planet.
- They will be able to apply Aananda's experience at a personal level.

Core Course(s) 3rd Year

DSC-13: Molecular Cell Biology (Semester – V)

On successful completion of the course, students will be:

- Explain the process of protein trafficking in the cell and the role of various regulatory proteins involved in the process.
- Discuss the different modes of cellular communication in a multicellular organism

- Explain the regulatory mechanisms involved in controlling the process of mitosis,
- meiosis, apoptosis, necrosis and autophagy.
- Examine the molecular and genetic basis of cancer development and various molecular approaches used for cancer treatment.

DSC-14: Concepts In Genetics and Evolution (Semester – V)

After completion of the course, a student will

- Explain the principles of Mendelian genetics and its extensions and applications.
- Examine the various factors that confer genotypic and phenotypic variability.
- Correlate human and viral genetics to create linkage and genetic maps.
- Perform experiments using the genetic model system *Drosophila melanogaster*.
- Analyse biological data using statistical tools.
- Discuss the principles of transmission and inheritance in real-life situations.

DSC-15: Gene Expression and Regulation (Semester – V)

On successful completion of the course, students will be:

- Analyse the processes of transcription and translation in prokaryotes and eukaryotes
- Discuss the features of the genetic code and various experimental approaches used to
- crack the code
- Perform estimation of RNA by orcinol method
- Discuss the molecular basis of RNA processing and RNA splicing
- Perform isolation of RNA from bacteria and plant cells
- Evaluate the various ways in which transcription and translation are regulated

DSC-16: Human Physiology (Semester – VI)

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

- Explain the homeostatic control and functioning of the human body systems
- Discuss the regulatory mechanism regulating different organ systems.
- Describe the functioning of the different organ systems.
- Explain the basis of various physiological diseases.
- Perform and analyse various physiological tests that examine the function of various human body systems.

DSC-17: Basics of Immunology (Semester – VI)

The Basics of Immunology course will provide undergraduate students with the following:

- Explain the concept of innate and adaptive immunity.
- Describe the structure and function of cells and organs of the immune system
- Discuss the Attributes of an immunogen, its structure and the tasks associated with
- different isotypes of antibodies
- Explain the humoral immune response and antibody diversity.
- Explain the Antigen presentation mechanisms and generation of cell-mediated immunity.

DSC-18: Fundamentals of Recombinant DNA Technology (Semester – VI)

After the completion of the course, the students will have:

- Perform restriction digestion of DNA samples.
- Prepare genomic and cDNA libraries,
- Perform basic cloning techniques to design a recombinant protein in a bacterial system.
- Design primers for PCR, perform DNA amplification by PCR and understand the principles of DNA sequencing.

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-3: In-Silico Tools in Proteomics and Genomics (Semester V)

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

- Discuss the basics of bioinformatics and computational biology
- Describe the use of several software/tools in omics biology.
- Discuss, access, and use biological databases in the public domain.
- Explain protein structure using visualisation software(s).
- Perform sequence alignments
- Discuss the fundamental aspects of *in-silico* protein structure prediction.
- Explain the applications of bioinformatics from genomes to personalised medicine.
- Describe the concept of drug designing using a bioinformatic approach.

DSE-4: Molecular Basis of Non-Communicable Human Diseases (Semester VI)

After the completion of the course, the students will have:

- Discuss the relationship between lifestyle and non-communicable diseases.
- Analyse the various molecular and biochemical interactions that contribute to the cause of NCDs.

- Explain the networking between endogenous and exogenous factors contributing to NCDs burden.
- Describe specific biomarkers that can be used to diagnose a disease or Disorder.
- Test various diagnostic parameters that are used to identify NCDs.
- Discuss the disease burden in today's urban society and understand the broad spectrum of symptom diversity in such diseases through case studies.

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5: Intermediary Metabolism (Semester V)

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

- On successful completion of the course, learners will be able to:
- Discuss the underpinnings of fuel metabolism
- Describe the mechanism of ATP synthesis.
- Discuss the biosynthesis and degradation pathways.
- Evaluate the interrelationships of carbohydrate and lipid metabolism
- Discuss the biosynthesis and degradation of amino acids and nucleotides
- Correlate the integration of metabolism

GE-6: Tools for Genetic Engineering **(Semester VI)**

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

- Grow bacterial culture and obtain single isolated colonies
- Estimate the concentration of DNA by UV spectroscopy
- Extract plasmid DNA from recombinant *E. coli*
- Perform restriction digestion and evaluate the end products by agarose gel electrophoresis
- Perform Polymerase chain reaction and amplify a DNA fragment
- Explain the various methods for expression of recombinant genes in *E.coli*
- Perform gene cloning

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC 5: Polymerase chain reaction (PCR) and its applications (Semester-V)

Students of this course should be able to learn:

- Students of this course should be able to learn:
- Concept of PCR and different types of PCR.
- Principles of oligonucleotide (primer) synthesis and purification
- Designing of Primers for PCR.
- Hands-on setting up of PCR reaction and analysis of the amplified product.
- Purification of PCR product

SEC 6: Isolation and characterization of Plasmid DNA (Semester-VI)

- At the end of this course, students should be able to learn and perform in Hands-on mode:
- Fundamentals of operation of different types of centrifuges, Electrophoresis,
- Spectrophotometer and about Good Laboratory Practices and working environment of Genomic Laboratory.
- Use of micropipettes, preparation of solutions, media and sterilisation.
- Basics of different types of nucleic acids
- Handle bacterial strains of *E. coli* for the isolation of single colonies and growth in liquid media.
- Isolate Plasmids using different methods and characterise by agarose gel electrophoresis.

2. COURSE: B.SC. (HONS.) BIOLOGICAL SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

Programme Learning Outcomes (PO)

The curriculum is designed to achieve the following outcomes:

PO1: To develop an in-depth knowledge and understanding of the fundamental concepts and principlesunderlying Biological processes.

PO2: To impart the procedural knowledge that creates different types of professionals in the field of Biological Science and related fields such as Plant physiology, Animal Behaviour, Natural Resource Management, Microbiology, Biotechnology, Nutritional Biochemistry and in teaching, research and environmental monitoring.

PO3: Students will be able to undertake hands-on laboratory work and activities that help develop students' practical knowledge and skills that are required for pursuing a career in clinical diagnosis, drug design, vaccine development, pharmaceutical industry, teaching, research, environmental monitoring.

PO4: Students will be able to use skills required for the extraction, separation, and synthesis of a varietyof biomolecules utilized in clinical diagnosis, pharmaceutical industry or in research laboratories.

PO5: Students will be encouraged to effectively communicate scientific reasoning and data analysis inboth written and oral forms.

PO6: Students will gain knowledge of ethical and good laboratory practices, health and biohazard regulations, plagiarism and intellectual property rights related issues practised in the modern era of scientific investigation.

PO7: Students will recognize and appreciate the importance of Biological Science and its application in academics, clinical diagnosis, prevention and treatment of diseases, agriculture, and industry and inthe economic, environmental and social contexts.

Course Outcomes: B.Sc. (Hons.) Biological Sciences (NEP UGCF-2022)

Core Course(s) 1st Year

BS-DSC-101: Basic Concepts of Biomolecules (Semester I)

After the successful completion of the course, the students will be able to

- Understand and apply the fundamental principles of chemistry which include bonding, electronic effects, molecular forces and stability of reactive intermediates tobiomolecules.
- Gain an insight into the influence of chemical bond polarization on a molecularstructure and its reactivity.
- Identify the type of metabolic reaction and draw reaction mechanisms for keymetabolic processes.
- Recognize stereochemistry of a biomolecule and give a rational explanation of itsbiological reactivity based on stereochemistry.
- Understand the chemistry and biological functions of carbohydrates and lipids.

BS-DSC-102: Photobiology (Semester I)

After the successful completion of the course, the students will be able to

- Understand and appreciate the dual nature of light.
- Comprehend the impact of light on biodiversity from pole to pole.
- Gain knowledge about the various photoreceptors in plants and animals and will appreciate and understand the mechanism of photosynthesis.
- Understand bioluminescence, photoperiodism and biological rhythms.
- Gain knowledge about the ecological and physiological responses to light.

BS-DSC-103: Diversity of Life forms I (Semester I)

After the successful completion of the course, the students will be able to

- Understand characteristic features of different plant and animal life forms.
- Identify, classify and differentiate diverse non-chordates based on their morphological,anatomical and systemic organization.
- Understand similarities and differences in life functions among various non-chordates.
- Appreciate and understand the relevance of wild relatives of cultivated plants, theirdomestication and green revolution.
- Understand the general characteristics, classification, economic importance, morphology,asexual and sexual reproduction of Algae, Fungi, Bryophytes and Pteridophytes.

BS-DSC-201: Cell Biology (Semester II)

After the successful completion of the course, the students will be able to

- Understand the cell and its biology which will help them to get an insight into theorigin of cells, cellular structure, various components of cells and functions.
- Understand the chemical composition, physicochemical and functional organization of organelle.
- Demonstrate the knowledge of common and advanced laboratory practices in cyto-biology.
- Acquire knowledge about how cells divide by means of meiosis and mitosis and willbe able to correlate different factors which control cell cycle progression.

BS-DSC-202: Diversity of Life forms I (Semester II)

After the successful completion of the course, the students will be able to

- Understand different characteristic features of different plant and animal life forms, classes of chordates, level of organization and evolutionary relationship between different subphyla and classes, within and outside the phylum.
- Study about diversity in animals and plants making students understand about their distinguishing features.
- Appreciate similarities and differences in life functions among various groups of animals and plants.
- Know about the habit and habitat of animals in marine, freshwater and terrestrial ecosysytems.
- Understanding of systematics its importance in biodiversity management, nomenclatureand classification systems of the plants.

BS-DSC-203: Chemical Energetics, Ionic Equilibria and Nanomaterials (Semester II)

After the successful completion of the course, the students will be able to

- Understand the concept of nano-dimensions.
- Know the various methods of preparation of nanomaterials.

- Know the different characterization techniques used for the analysis of nanomaterials and understand the basic principle behind these techniques.
- Understand the diverse properties of nanostructures.
- Appreciate the real-world applications of nanomaterials.
- Understand the laws of thermodynamics, basic principles of thermochemistry and equilibria and successfully extend the concepts learnt in this course to biological systems.
- Understand concept of pH and its effect on the various physical and chemical propertiesof the compounds.
- Use the concepts learnt to predict feasibility of chemical reactions and to study the behaviour of reactions in equilibrium.
- Explain the concept of ionization of electrolytes with emphasis on weak acid and baseand hydrolysis of salt.
- Apply the concepts of pH and electrolytes while studying other chemistry courses andeveryday life.

Core Course(s) 2nd Year

DSC-7: PHYSICS FOR BIOLOGISTS (Semester – III)

On successful completion of the course students will:

- Learn about various aspects of mechanics, centrifugal forces, mechanical forces with examples.
- Understand and explain molecular theory, Gauss's law, medical significance and applications of the dielectric properties of biological materials.
- Describe simple harmonic motion, diffraction, lasers and its applications in medical science.
- Appreciate the Doppler effect and the effects of vibrations in humans with respect to physics of hearing, heartbeat etc.
- Learn to investigate the light absorption properties of molecules through spectrophotometry, for qualitative and quantitative analysis of biomolecules.

DSC-8: PROTEIN STRUCTURE AND ENZYMOLOGY (Semester – III)

After completion of the course, a student will be able to:

- Describe the functional spectrum of proteins and the different levels of structural organization of proteins.
- Explain the relationship between protein structure and function.
- Appreciate and analyse the data from techniques used to purify and characterise proteins.
- Explain enzyme classification, activity, kinetics, inhibition, regulation and mechanism of action of different classes of enzymes.
- Acquire knowledge about the application of enzymes in medicine and industry.

DSC-9: FUNCTIONAL ECOLOGY (Semester – III)

On successful completion of the course students will be able to:

- Comprehend the principles and applications of ecology and ecosystem.
- Know about the importance of ecosystem in general and the effects of changes inecosystem.
- Understand the techniques used for the quantitative and qualitative estimation of bioticandabiotic components of an ecosystem.
- Gain knowledge about the density, frequency and diversity of species in an ecosystem.
- Understand about key interactions between organisms like competition , predation ,parasitismetc.
- Participate in citizen science initiatives from an ecological perspective.
- Able to understand abiotic and biotic components of the ecosystems and their interactions at different levels.
- To emphasize on the extent of biodiversity, its depletion and management using various conservation approaches.

DSC-10: METABOLISM AND INTEGRATION (Semester – IV)

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

- Outline the pathways involved in catabolism and biosynthesis of glucose.
- Understand the biosynthesis and degradation of glycogen
- Comprehend the catabolism and biosynthesis of fatty acids
- Understand the biosynthesis and degradation of amino acids and nucleotides
- Understand the integration of metabolism

DSC-11: ANIMAL PHYSIOLOGY (Semester – IV)

On successful completion of the course students will:

- Know how animals obtain energy from their environment.
- Understand the unique role of various organs and organ systems inperforming various vital functions.
- Understand the role of physiology in adapting to various environments.
- Appreciate the importance of homeostasis in different animals.
- Learn to apply critical thinking and integrate scientific knowledge to understand the basic physiological principles which led to diverse evolutionaryadaptations.

DSC-12: PLANT PHYSIOLOGY (Semester – IV)

After the completion of the course, the students will be able to:

- Comprehend the fundamental concepts of plant physiology
- Understand the physiological mechanisms of plant growth, function, and development.
- Understand the integration of soil, atmosphere, and plant in carrying out the life processes by plants.
- Understand the complex regulation of phenomena of growth and flowering.
- Use the knowledge gained to help crop growers, fruit farmers,floriculturists and others in the related area.

Discipline Specific Elective Course(s) (DSE)

DSE-1: MEDICINAL AND ETHNOBOTANY (Semester III)

On successful completion of the course, a student will:

- Be able to identify the common medicinal plants in their vicinity.
- Learn about the traditional healing sciences namely Ayurveda, Siddha and Unani, which have been used since the ancient times.
- Appreciate the importance of conservation strategies for medicinal plants.
- Be able to understand the importance of medicinal plants, significance of ethnobotany, role of ethnic groups in the conservation of medicinal plants.

DSE-2: HORMONE BIOCHEMISTRY (Semester III)

On successful completion of the course, a student will:

- Understand the role of endocrine system in maintaining ionic and glucose homeostasis.

- Be able to describe molecular, biochemical and physiological effects of all hormones and factors on cells and tissues.
- Understand the integrative communications that regulate, growth, appetite, metabolism and reproduction
- Be able to interpret clinical parameters in a real-life situation**.**

DSE-3: APPLIED ENTOMOLOGY (Semester III)

Upon completion of the course, students will be able to:

- Learn about the concept of pest and pest status.
- Understand the difference between various types of pests and Crop losses and extent of damage caused by them.
- Gain knowledge about economically important insects; important pests of crops, fruits, vegetables, stored grains and also about medically important insects.
- Do analysis of varied types of control measures for management of pest populations and list suitable control measures- specific for every pest.

DSE-4: NATURAL RESOURCES AND THEIR SUSTAINABLE UTILIZATION (Semester IV)

On successful completion of the course, a student will:

- Be able to define and differentiate between biological and physical natural resources.
- Appreciate the role of natural resources in ecological, economic and socio-cultural activities
- Understand the effect of anthropogenic interference on natural resources.
- Understand the laws and policies associated with resource management and conservation.

DSE-5: HUMAN NUTRITION AND BIOCHEMISTRY (Semester IV)

On successful completion of the course, a student will:

- Critically analyze and evaluate concepts in nutritional biochemistry that are important for an understanding of human nutrition.
- Appreciate the biochemical underpinning of human nutrition in maintaining health.
- Demonstrate understanding of the biochemical basis of essentiality of macro and micronutrients and their nutritional deficiencies.

- Be aware of techniques used in the assessment of nutritional status and nutritional disorders. Understand drug nutrient interactions.

DSE-6: CONSERVATION AND MANAGEMENT OF WILDLIFE (Semester IV)

Upon completion of the course, students will be able to:

- Understand the importance of wildlife in general, and its conservation and management in particular.
- Comprehend the application of the principles of ecology and animal behaviour to formulate strategiesfor the management of wildlife populations and their habitats.
- Understand the management practices required to achieve a healthy ecosystem for wildlife population along with emphasis on conservation and restoration.
- Know the key factors for loss of wildlife and important strategies for their in situ and ex situ conservation.
- Recognize the techniques for estimation, remote sensing and Global Position Tracking for wildlife.
- Gain knowledge about the wildlife diseases and the quarantine policies.
- Know about the Protected Area Networks in India, Ecotourism, Ecology of perturbation and Climaxpersistence.
- Perform critical thinking, literature review; scientific writing as well as presentations; and participationin citizen science initiatives with reference to wildlife.

Generic Elective Course(s) (GE) (Common Pool)

N.A.

Skill Enhancement Course (SEC) (Common Pool)

N.A.

Value Addition Course(s) (VAC) (Common Pool)

N.A.

Core Course(s) 3rd Year

DSC-13: MOLECULAR BIOLOGY-I (Semester – V)

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

- Explain the basic information about the structure of DNA and various forms of DNA, about organization of genome in various life forms, supercoiling of DNA and its significance.
- Outline and elaborate the molecular basis of processes like DNA replication, recombination and transposition and explain the significance of these processes.
- Discuss about the various ways in which the DNA can be damaged leading to mutations and lesions and the different ways that DNA damage can be repaired.

DSC-14: TRANSMISSION AND MOLECULAR GENETICS (Semester – V)

Upon completion of the course, the students will be able to:

- Understand the concept of genotype and phenotype, describe the basic principles of Mendelian genetics and appreciate the various factors that confer genotypic and phenotypic variability.
- Understand the inter relationship between environment (Nurture) versus inheritance(Nature) in determining the conversion of genotype to phenotype.
- Be able to use the concepts of bacterial and viral genetics to understand resistance patternsand to create linkage and genetic maps
- Be able to apply the principles of transmission and inheritance in real life situations.

DSC-15: GROWTH AND REPRODUCTION (Semester – V)

By the end of the course, the student will be able to:

- Students will understand the development of plants from juvenile to senescent stage with the associated genetic, cellular, anatomical and morphological changes.
- Students will appreciate the role of pollinators and get hands-on experienceof observing patterns on pollen grains, pollen germination, embryo andendosperm dissection, and collecting seeds with different dispersal mechanisms.
- Students will understand the reproductive system in animals and human beings so as to relate with the control of population and environmental threats in the current scenario.
- Students will be able to explain how errors in development can lead to congenital defects.
- Students will visualize and appreciate concepts learnt in theory and applyexperimental approaches to understand these developmental events in the laboratory.
- Acquaint the students with internal basic architecture and cellular composition of plant body.

- Correlate important functions performed by different plant parts.
- Gain knowledge regarding reproduction and development plays a pivotal role in making student understand population structure and natural diversity in a better way.

DSC-16: MOLECULAR BIOLOGY-II (Semester – VI)

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

- Acquire basic knowledge about the processes of transcription and translation in prokaryotes and eukaryotes.
- Learn about the features of the genetic code and various experimental approachesused to crack the code.
- Develop understanding of the molecular basis of RNA processing and RNA splicing.
- Learn about the various ways in which these biological processes are regulated and the significance of regulation in maintaining life forms.

DSC-17: DEFENSE MECHANISMS IN LIVING ORGANISMS (Semester – VI)

On successful completion of the course, students will be:

- Understand the concept of genotype and phenotype, describe the basic principles of Mendelian genetics and appreciate the various factors that confer genotypic and phenotypic variability.
- Understand the interrelationship between environment (Nurture) versus inheritance (Nature) in determining the conversion of genotype to phenotype.
- Be able to use the concepts of bacterial and viral genetics to understand resistance patterns and to create linkage and genetic maps.
- Be able to apply the principles of transmission and inheritance in real-life situations.

DSC-18: EVOLUTIONARY BIOLOGY (Semester – VI)

By the end of the course, the student will be able to:

- Learn about the origins and development of evolutionary thought.
- Learn about the compelling evidence in favor ofevolution likefossils, comparative anatomy and molecularhomologies.
- Learn about the origin and history of life through fossil records.
- Understand how biodiversity is generated by repeatedspeciation andlost over time due to mass extinctions.

- Understand how the forces of evolution likevariations, naturalselection, genetic drift and migration shapepopulations.
- Learn how novelty in organisms arises, how organisms adapt to their environment and about our origins from our primate ancestors.

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-7: PLANT RESOURCE UTILIZATION (Semester V)

On successful completion of the course, a student will:

- Know about the concept of origin of cultivated plants
- Gain an understanding of morphology, processing and economic value of plant sources of cereals,legumes, spices, oil, beverages, medicines etc.
- Gain an insight into the importance of medicinal plants and their therapeutic properties
- Understand the extraction of essential oils and their commercial applications.
- Learn to perform the micro-chemical tests to demonstrate various components present ineconomically important plants.

DSE-8: MEMBRANE BIOLOGY (Semester V)

On successful completion of the course, a student will:

- Understand the general composition and structure of biomembranes.
- Gain knowledge of the basic properties of membranes such as membrane fluidity.
- Have knowledge about the various types of membrane transport mechanisms.
- Have knowledge about the molecular mechanism of vesicular transport and membrane fusion.

DSE-9: ETHOLOGY (Semester V)

Upon completion of the course, students will be able to:

- Understand types of animal behaviour and their importance to the organisms.
- Enhance their observation, analysis, interpretation and documentation skills by taking
- short projectspertaining to Animal behaviour and emotions.
- Relate animal behaviour with other subjects such as Animal biodiversity, Evolutionary
- biology, Ecology, Conservation biology and Genetic basis of the behaviour.
- Realize, appreciate and develop passion to biodiversity; and will respect the nature
- Learn to evaluate and analyse human behaviour and emotions, and develop intuitive

- skills and empathyfor better leadership qualities.

DSE-10: PLANT DEVELOPMENT AND ANATOMY (Semester VI)

On successful completion of the course, a student will:

- Have knowledge about the various cells and tissues, meristems, epidermal and vascular tissue systems in plants.
- Understand various aspects of growth, development of the tissues and differentiation of various plant organs.
- Have knowledge of basic structure and organization of plant parts in angiosperms. • Correlate the structure with morphology and functions.

DSE-11: PHARMACOLOGY AND TOXICOLOGY (Semester VI)

On successful completion of the course, a student will:

- Understand the basic scientific concepts and principles that serve as the foundational underpinnings of the pharmacological sciences including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions.
- Learn an introduction to the processes by which new drugs are discovered.
- Understand the specific pharmacology of the major drugs and drug classes currently used in medical practice including their indications, clinical use and mechanisms of action,
- Discuss the basic principles of toxicology; the mechanisms by which excess exposure to certain drugs, toxins, chemicals, heavy metals and poisons can lead to adverse toxicological effects.

DSE-12: DEVELOPMENTAL BIOLOGY (Semester VI)

Upon completion of the course, students will be able to:

- Understand the fundamental processes that underpin the fertilization of an egg cell and its stepby-step transformation into the fascinating complexity of a whole organism.
- Learn how a cell behaves in response to an autonomous determinant or an external signal depends on the combination of transcriptional and posttranscriptional regulators, signaling pathway components, cytoskeletal elements, and other proteins and RNAs that it has synthesized earlier: i.e., on its developmental history. Students learn best by doing and by having the opportunity to put what they havelearned into practice. Therefore, various model organism will be used as a learning tool.

- Understand that cells only express a proportion of their genome, and that differential gene expression underlies cell differentiation and any alteration in the entire process of development leads to devastating diseases.

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

N.A.

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

N.A.

Value Addition Course(s) (VAC) (Common Pool)

N.A.

3. COURSE: B.SC. (HONS.) BOTANY

DEPARTMENT: BOTANY

Program Outcomes (POs)

The core courses form the backbone of this framework whereas discipline specific electives, generic electives, skill enhancement courses and value addition courses would add academic excellence in the subject together with multi-dimensional and interdisciplinary approach.

The curriculum is based on the following learning outcomes –

PO1: To develop an in-depth knowledge and understanding of the fundamental concepts and principles underlying plant sciences.

PO2: To impart the procedural knowledge that creates different types of professionals in the field of Botany and associated fields such as Agriculture, Natural Resource Management, Microbiology, Biotechnology and in teaching, research and environmental monitoring.

PO3: Students will be exposed to laboratory expertise and skills in subjects like taxonomy, ecology, molecular biology, plant physiology, plant metabolism, plant tissue culture, plant microbe interaction that help develop in students practical knowledge and skills that are required for teaching, research, environmental monitoring.

PO4: Students will be introduced to different biostatistics tools that aid in analysis of different forms of biological data and its interpretation.

PO5: Students will be able to use various bioinformatics tools for training in the basic theory and application of programs used for database searching, protein and DNA sequence analysis and prediction of protein structures.

PO6: Students will be encouraged to effectively communicate scientific reasoning and data analysis in both written and oral forms.

PO7: Students will gain knowledge of ethical and good laboratory practices, health and biohazard regulations, plagiarism and intellectual property rights related issues practiced in modern era of scientific investigation.

PO8: Students will also be introduced to broader horizons of the subject like ethnobotnay, medicinal botany, organic farming, hydroponics, biofertilisers, mushroom cultivation, ayurveda and nutrition, plant breeding etc.

Course Outcomes: B.Sc. (Hons.) Botany (NEP UGCF 2022)

Core Course(s) 1st Year

BOT-DSC-1: Plant Diversity and Evolution (Semester-I)

By studying this course students will gain basic knowledge on:

- The diversity and general characteristics of plants and microbes.
- Various groups of plants and their evolutionary relationships.
- Basic principles and concepts of evolution that contribute to plant diversity.
- The diversity of plants and microbes present on the planet and their relationships with each other in light of evolution.

BOT-DSC-2: Cell Biology: Organelles and Biomolecules (Semester-I)

By studying this course, students will gain basic knowledge on:

- The relationships between the properties of biomolecules, their cellular activities and biological functions.
- Physico-chemical composition of organelles and their functional organization.
- The Cell as a structural and functional unit of life.
- The various types of biomolecules (proteins, carbohydrates, lipids and nucleic acids) and their roles in cell structure and function.
- The structures of different organelles and their role in fundamental metabolic processes of a cell.

BOT-DSC-3: Basic Laboratory and Field Skills in Plant Biology (Semester-I)

This course will be able to demonstrate basic knowledge and understanding of:

- Fundamental skills important for performing laboratory and field experiments.
- Good laboratory practices, management of laboratory waste, understanding hazards and risks to ensure a safe laboratory environment.
- Basics of measurements, units and common mathematical calculations, sampling and data collection.
- Operation and maintenance of basic laboratory instruments.
- Presentation, analysis of data and interpretation of results.

BOT-DSC-4: Microbiology and PlantMicrobe Interactions (Semester-II)

Learning Outcomes:

- Understanding microbes and their roles and applications.
- Understanding about modes of reproduction of Viruses, Archaebacteria, Eubacteria
- Understand plant-microbe interaction
- Understanding about the microbial world and their interactions with plants.

BOT-DSC-5: Plant Resources and Economic Botany (Semester-II)

The course will help students gain knowledge on:

- The economic importance of diverse plant species and train them in identifying plants of economic importance through field visit/s, live plant specimens, herbarium specimens and digital resources.
- The different plant parts and plant products such as food, fibers, medicines, oils and others).
- The processing of various plant resources and train them to identify and analyse nutrients using simple microchemical tests.
- The economic importance and products derived from plants and their roles in our daily lives.
- The regional diversity in food crops and other plants and their ethnobotanical importance.

BOT-DSC-6: Plant Systematics (Semester-II)

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

- Understand technical terminology used in plant taxonomy.
- Apply the terminologies to describe, identify and classify flowering plants .
- Search and analyse taxonomic information from internet-based scientific databases and other resources.
- Interpret and evaluate the concept of species and evolutionary processes in angiosperms.
- Comprehend and compare various systems of classifications.
- Recognise diversity in local/regional flora.
- Appreciate the significance and application of systematics in science and welfare of society.

Generic Elective course(s) (GE) (Common Pool)

BOT-GE-1: Plant Diversity and Human Welfare (Semester-I)

After studying this course, the student will gain knowledge about:

- The diversity of various groups of plants, their characteristics and identification.
- Different phytogeographic zones in India.
- The basic principles of conservation of Biodiversity and Sustainable Development Goals (SDG).
- The role of plants in human welfare.
- The different groups of plants and their roles in supporting human life.

BOT-GE-2: Biofertilizers (Semester-I)

On successful completion of this course, a student will be able to:

- Visualize and identify different types of microorganisms with a compound microscope.
- Understand the classification of microorganisms according to their shape/ structurefor morphological identification. Prepare and sterilize different types of culture media.
- Isolate microorganisms from the environmental samples and culture in aseptic conditions.
- To develop an understanding of biological systems used as fertilizers and build skills in handling microbial inoculants.
- To understand the optimum conditions for growth and multiplication of useful microbes such as *Rhizobium*, cyanobacteria, mycorrhizae, *Azotobacter* etc.
- To understand the role of microbes in mineral cycling and nutrition of plants.
- To gain expertise in various methods of decomposition of biodegradable waste, conversion into compost and apply this knowledge and skill in their daily life.

BOT-GE-3: Protected Agriculture – Hydroponics and Organic Cultivation (Semester-I)

The Learning Outcomes of this course are as follows:

- Students will develop a thorough understanding of the concepts of Hydroponics, Aquaponics and Organic farming.
- Students will be trained in establishing hydroponic facility.
- Students will learn the development of various organic products such as biopesticides, biofertilizers and bio-0rganic growth promoters.
- Students will understand various government policies in marketing of hydroponic and organic produce.
- Students will understand Good Agricultural Practices associated with protected agriculture.

BOT-GE-6: Ethnobotany (Semester-II)

After studying this course the student will have an understanding of the value and usefulness of the natural products and their efficient use by the local communities as food and medicine and their conservation practices. It will also impart knowledge of the plants used by the local communities, tribals, ethnic groups, their nutritive and medicinal value.

BOT-GE-7: Viewing and Capturing Diversity in Nature (Semester-II)

On successful completion of this course, a student will be able to:

- Understand the digital camera or smartphone camera functions.

- Use different photographic equipment to enhance their photographic skills.
- Know about the photographic variables with weather and season.
- Exploit their photographic work in various professions and for entrepreneurship development.
- Have a comprehensive introduction to photography, including aesthetics and technique.
- Rrethink the environment in which they live through the medium of pictures.
- Build familiarity with digital camera and smartphone photography.
- Use nature photography in business and career prospects.
- Enhance appreciation for the tremendous beauty inherent in plants and gardens/nature.

BOT-GE-8: Agricultural Botany and Weed Science (Semester-II)

After completion of this course the students would be able to understand:

- How the quality of seeds is judged and how are the suitable conditions for the seed germination created.
- How are the growth, flowering and fruiting in plants managed through the applications of hormones.
- How are weeds managed in commercial crops.
- The conditions required for seed germination.
- Growth hormones, plant development and flowering conditions.

Value Addition Course (VAC) (Common Pool)

VAC-I: Science and Society (Semester I)

This paper is interdisciplinary in nature and would provide students with basic exposure to scientific methods, technologies and developments that have played a significant role in the evolution of human society from ancient to modern times. The primary objective of this course is to instill in students an appreciation for science and a scientific outlook and temper. The course further aims to increase awareness about fundamental scientific concepts that play an important role in our daily life using various examples and case studies. Students would also be made aware of the scientific rationale of technological developments that would enable them to make informed decisions about their potential impact on society.

VAC-II: Fit India (Semester II)

The learning outcomes of this course are as follows:

- adopting a healthy lifestyle.

- knowledge of nutrition, diet and psycho-physiological aspects of fitness.
- develop self-esteem, self-confidence, self-discipline and team spirit as indicators of fitness.

Skill Enhancement Course (SEC) (Common Pool)

SEC I: Sustainable Ecotourism and Entrepreneurship (Semester-I)

After studying this course, students will be able to:

- Develop next generation ecological entrepreneurs.
- Evolve eco-literate society by integrating market-based instruments with eco-cultural knowledge of traditional societies.
- Practice ecological knowledge for wealth generation, environmental conservation, and popularization of Indian traditional knowledge.

SEC II: Green Belt Development for Smart Cities (Semester-II)

After completion of the course, students will be able to:

- Measure factors (biotic and abiotic) contributing to sustainable, healthy environment.
- Assess, describe and use the appropriate plants for restoring polluted environment.
- Use their skills enhancing for green infrastructure development (UN-SDG).

Core Course(s) 2nd Year

DSC-7: PHYCOLOGY -THE WORLD OF ALGAE (Semester – III)

On successful completion of the course students will be able to gain basic knowledge of algae, with reference to:

- the diversity and general characteristics.
- distinguishing features of taxa belonging to different families.
- the various ecological and economic benefits.

DSC-8: BRYOPHYTES, PTERIDOPHYTES AND GYMNOSPERMS (Semester – III)

After completion of the course, a student will be able to:

- identify and describe the group of plants that have given rise to land habit and the flowering plants.
- comprehend various phenological stages of the plants belonging to the sub-groups – bryophytes, pteridophytes and gymnosperms.

DSC-9: GENETICS & PLANT BREEDING (Semester – III)

After completion of the course, a student will be able to:

- understand the fundamentals of Mendelian inheritance and its deviation in gene interactions.
- describe the concepts of linkage and crossing over and their usage in constructing gene maps.
- become familiar with pedigree analysis.
- learn about principles of population genetics.
- gain knowledge about gene mutations and inherited disorders
- learn about various plant breeding techniques / methods

DSC-10: MYCOLOGY (Semester – IV)

After completion of the course, a student will be able to:

- understand the world of fungi, lichens and pathogens of plants
- understand characteristics the ecological and economic significance of the fungi and lichens
- understand the application of mycology in various fields of economic and ecological significance

DSC-11: ECOLOGY AND CONSERVATION (Semester – IV)

After completion of the course, a student will be able to understand:

- the interrelationship between organisms and environment.
- methods to study vegetation, community patterns and processes, ecosystem functions, and principles of phytogeography.
- evolving strategies for sustainable natural resource management and biodiversity conservation.

DSC-12: DEVELOPMENT AL BIOLOGY OF ANGIOSPERMS: FORM, ANATOMY & FUNCTION (Semester – IV)

After the completion of the course, the students will:

- become familiar with the structure and functions of various components of plant cell
- understand the process of cell growth and its regulation
- comprehend the structure and functions of tissues organising the various plant organs

- get acquainted with the reproductive processes involved in the life cycle of angiosperms
- be able to appreciate the interactions between the developmental pathways resulting in the differentiation of plant body
- recognise the importance of plant developmental biology in the improvement and conservation of plants.

Discipline Specific Elective Course(s) (DSE)

DSE-1: BIOSTATISTICS & BIOINFORMATICS FOR PLANT SCIENCES (Semester III)

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

- use the various online databases and resources for accessing biological data.
- use the different methods of alignment of DNA, RNA and protein sequences and
- interpret the significance of the same.
- understand the descriptive and inferential statistical tests for interpretation of experimental data.

DSE-2: N.A. (Semester IV)

Generic Elective Course(s) (GE) (Common Pool)

GE-3: Inheritance in Biology **(Semester III)**

- Students will get familiarized with the concepts and principles of inheritance, sex determination, causal agents of genetic changes (mutations) and defects (congenital diseases) in humans. The course will also enable students to learn how genetic information is used to detect diseases and also to establish unique identity of an individual.

GE-4: N.A. (Semester IV)

Skill Enhancement Course (SEC) (Common Pool)

SEC 3: Environmental Auditing (Semester-III)

- After the course, the students will be able to serve as a catalyst for developing ecoliterate industry and evolving sustainable policies.

SEC 4: N.A. (Semester-IV)

Value Addition Course(s) (VAC) (Common Pool)

VAC3: THE ART OF BEING HAPPY (Semester-III)

- The students shall be able to evaluate the factors contributing to the phenomenon of being happy. They will be able to apply the experience of Aananda at a personal

VAC4: N.A. (Semester-IV)

Core Course(s) 3rd Year

DSC-13: MOLECULAR BIOLOGY OF THE CELL (Semester – V)

On successful completion of the course students will understand:

- structure and function of nucleic acids at molecular level.
- the concept of central dogma and genetic code.
- molecular details of DNA replication and its types.
- cellular processes of transcription and translation including modification of transcripts and polypeptides/proteins
- mechanisms regulating gene expression.

DSC-14: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (Semester – V)

After completion of the course, a student become familiar with:

- The significance and scope of reproductive biological studies in crop production and conservation. Structure and function of anther and ovule, male and female gametophyte.
- The significance of associations of MGU, FGU and double fertilization; embryo and endosperm development, genomic imprinting.
- Pollination and seed dispersal mechanisms, apomixis and polyembryony as alternate pathways of angiosperm reproduction.
- Experiential learning through field trips, scientific photography, videography and documentary preparation. The students will also learn to write scientific reports and present scientific data.

DSC-15: PLANT PHYSIOLOGY (Semester – V)

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

- understand the structure and function of plants
- comprehend and compare various tissue systems in plants and their role
- realise the importance of water, soil and atmosphere in the life of organisms
- appreciate the ability of plants to sense the environment and adapt
- interpret and evaluate the significance of regulator molecules in controlling life forms
- apply the principles of plant physiology to solve problems in related fields

DSC-16: PLANT BIOTECHNOLOGY (Semester – VI)

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

- understand basic concepts, principles and methods in plant biotechnology.
- explain the use of acquired knowledge in biotechnological, pharmaceutical, medical, ecological and agricultural applications.

DSC-17: PLANT BIOCHEMISTRY AND METABOLISM (Semester – VI)

At the end of the course the student will:

- know the details of carbon assimilation, oxidation, synthesis of ATP- the energy currency of the cell, nitrogen fixation and lipid metabolism.
- understand the role of enzymes in regulating metabolic pathways for molecules like carbohydrates, lipids and proteins.
- understand the coordination of various biochemical reactions with reference to cell requirement and its economy.

DSC-18: ADVANCED TOOLS & ANALYTICAL TECHNIQUES IN PLANT BIOLOGY (Semester – VI)

After the completion of the course, the students will be:

- competent in the basic principles of major techniques used in study of plants
- understand principles and uses of light, confocal, transmission and electron microscopy, centrifugation, spectrophotometry, chromatography, x-ray diffraction technique and chromatography techniques

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-3: NATURAL RESOURCE MANAGEMENT (Semester V)

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

- understand the different resources available in nature
- learn the importance of each resource along with the threats to these resources
- gain an in-depth understanding of management of these resources and also restoration of natural ecosystems
- study the importance of sustainable practices
- gain an insight into various initiatives taken the world over to save our natural resources.
- understand the concept of clean energy and management of waste

DSE-4: N.A. (Semester VI)

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5: GENETIC ENGINEERING TECHNOLOGIES & APPLICATIONS (Semester V)

At the end of this course students would be able to:

- understand methods and techniques involved in manipulation and analysis of nucleic acids, gene cloning and creation of genetically modified organisms (GMOs).
- understand the commercial application of rDNA technology in research, agriculture and human health.
- comprehend biosafety and ethical issues associated with rDNA technology.

GE-6: N.A. (Semester VI)

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC 5: GREEN BELT DEVELOPMENT FOR SMART CITIES (Semester-V)

SEC 6: N.A. (Semester-VI)

4. COURSE: B.SC. (HONS.) CHEMISTRY

DEPARTMENT: CHEMISTRY

Programme Learning Outcomes (POs)

The program outcome for B.Sc. (Hons.) Chemistry from the University of Delhi may include:

PO1: Knowledge and Understanding: Graduates will demonstrate a deep understanding of chemical principles, theories, and concepts, and will be able to apply them to real-world problems.

PO2: Laboratory Skills: Graduates will be proficient in laboratory techniques, including safety protocols, instrumentation, data analysis, and interpretation.

PO3: Critical Thinking: Graduates will be able to analyze and evaluate scientific data and literature, and will be able to develop and implement effective research strategies.

PO4: Communication Skills: Graduates will be able to effectively communicate scientific information, both verbally and in writing, to a variety of audiences.

PO5: Professionalism: Graduates will demonstrate professionalism and ethical behavior in all aspects of their work, including adherence to scientific integrity and responsibility.

PO6: Interdisciplinary Knowledge: Graduates will have a broad understanding of other disciplines related to chemistry, including physics, mathematics, biology, and environmental science.

PO7: Career Readiness: Graduates will be prepared for a wide range of careers in academia, industry, government, and non-profit organizations, as well as for advanced studies in chemistry or related fields. Pursue advanced studies and careers in chemistry, pharmaceuticals, biotechnology, materials science, environmental science, and other related fields.

PO8: Lifelong Learning: Graduates will have a commitment to ongoing learning and professional development, and will be able to adapt to new technologies and changing scientific paradigms

PO9: Graduates are given the opportunity to opt for skill development course of their choice which will equip the individuals with specialized knowledge and practical skills, enhancing their employability, fostering personal growth, and enabling them to adapt to the ever-evolving demands of the professional world.

Course Outcomes: B.Sc. (Hons.) Chemistry Semester 1 (NEP UGCF-2022)

Core Course(s) (I & IInd Sem)

DSC1: Inorganic Chemistry-1: Atomic Structure & Chemical Bonding (Semester I)

On completion of the course, the student will be able to:

- **CO1:** Solve the conceptual questions using the knowledge gained by studying the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionization enthalpy and electron affinity of elements.
- **CO2:** Draw the plausible structures and geometries of molecules using radius ratio rules, VSEPR theory, and MO diagrams (homo- & hetero-nuclear diatomic molecules).
- **CO3:** Understand the concept of lattice energy using Born-Landé and Kapustinskii equation.
- **CO4:** Calibrate the apparatus used in titrimetric analysis and prepare standard solutions for titration.
- **CO5:** Understand the theory and application of various acid-base and redox titrations.
- **CO6:** Comprehend the theory of acid-base indicators.
- **CO7:** Describe covalent, Valence Bond theory (Heitler-London approach), Bent's rule.
- **CO8:** Explain the concepts of Covalent compounds, molecular orbital theory, MOT diagrams, shapes of molecules.
- **CO9:** Describe the Qualitative idea of valence bond and band theories, dipole interactions, and theories of hydrogen bonding.
- **CO10:** Develop an understanding of Titrimetric Analysis & Calibration, Know the Preparation of solutions of titrants of different Molarity/Normality.
- **CO11:** Gains both practical and conceptual knowledge on titrimetric analysis especially on use of various indicators in acid-base titrations and principles of redox titrations

DSC2: Organic Chemistry-1: Basic Concepts and Aliphatic Hydrocarbons (Semester I)

On completion of the course, the student will be able to:

- **CO1:** To understand the types of electronic displacements and their impact on acidity/basicity, course of a reaction, stability of the molecule.
- CO2: To predict the physical and chemical properties of a molecule based on its structure and geometry.
- CO3: To predict the course of the reaction on the basis of reaction condition and ability to write the mechanism by making a proper use of directed-arrow convention.

- CO4: To analyse the formation of reaction intermediate under the given conditions of a chemical reaction
- CO5: To understand the types of intermediate and their stability
- CO6: To have a basic understanding of the arrangement of atoms in space, concept of handedness/ chirality
- CO7: Ability to draw stereoisomers in the standard 3- dimensional conventions, and determine relationships between pairs of stereoisomers (both conformational and configurational)
- CO8: Develop proficiency in performing organic chemistry experiments, including techniques such as synthesis, purification

DSC3: Physical Chemistry-1: Gaseous and Liquid (Semester I)

On completion of the course, the student will be able to:

- CO1: Explain the basic and advanced concepts regarding gaseous and liquid states of matter.
- CO2: Understand the concepts about the basic expressions for determining the physical properties of gases and liquid states.
- CO3: Understand the role of intermolecular forces of interactions in states of existence of matter as well their effects on their properties
- CO4: Understand the significance of various properties related to gaseous and liquid states along with the derivation of their mathematical expressions.
- CO5: Analyze the applications of the concepts of various properties related to gases and liquid states to day-to-day life.
- CO6: Handle laboratory apparatus like stalagmometers and Ostwald viscometers properly for the determination of surface tension and viscosity of liquids.

DSC4: Inorganic Chemistry-2: s- and p-Block Elements (Semester II)

On completion of the course, the student will be able to:

- **CO1:** Describe the fundamental principles of metallurgy as well as the significance of the recovery of by-products during extraction.
- **CO2:** Explain the characteristics of s- and p- block elements and apply them for synthesis.

- **CO3:** Describe about Reactions of alkali and alkaline earth metals
- **CO4:** Apply the concept and use of complexometric titrations.
- **CO5:** Explain the theory and application of complexes
- **CO6:** Explains about Electronic configuration, atomic and ionic size, metallic/non-metallic character.
- **CO7:** Describes about different types of Allotropy of C, P, S; inert pair effect
- **CO8:** Apply the diagonal relationship between B and Si and anomalous behaviour of first member of each group.
- **CO8:** Describes Preparations, structures of Group -13 to 17
- **CO9:** Describes Preparation, properties, structure and uses of the following compounds Borazine, Silicates, silicones, Phosphonitrilic halides {(PNCl2)n where n = 3 and 4}
- **CO10:** Describes Interhalogen and pseudohalogen compounds, Clathrate compounds of noble gases, xenon fluorides (MO treatment of XeF2).

DSC5: Organic Chemistry-2: Haloalkanes, Arenes, Haloarenes, Alcohols, Phenols, Ethers and Epoxides (Semester II)

On completion of the course, the student will be able to:

- **CO1:** Understand about the physical of the functional groups under study based on their electronic/steric structures
- **CO2:** Explain the chemical behaviour of these functional groups based on electronic and steric factors and to carry out transformations.
- **CO3:** Formulate the mechanistic route of organic reactions of arenes, haloalkanes, haloarenes, alcohols, phenols, epoxides and ethers by recalling and correlating the fundamental concepts.
- **CO4:** Understand the concept of organometallic compounds
- **CO5:** Understand the synthetic importance of the organometallic compounds with special reference to Grignard reagent and to carry out chemical transformations.
- **CO6:** Outline a rational synthesis of various organic compounds with different functionalities on the basis of reactions, reaction conditions and mechanisms learned in the course.
- **CO7:** Students will develop proficiency in performing organic chemistry experiments, including techniques such as synthesis, purification

DSC6: Physical Chemistry-2: Thermodynamics and its Applications (Semester II)

By the end of the course, the students will be able to:

- **CO1:** Understand the three laws of thermodynamics, concept of State and Path functions, extensive and intensive properties.
- **CO2:** Derive the expressions of ΔU, ΔH, ΔS, ΔG, ΔA for an ideal gas under different conditions such as, isothermal, adiabatic, free expansion etc.
- **CO3:** Explain the concept of partial molar properties.
- **CO4:** Understand the concepts of thermochemistry and equilibria.
- **CO5:** Use the concepts learnt to predict feasibility of chemical reactions and to study the behaviour of reactions in equilibrium.
- **CO6:** Determine of heat capacity of a calorimeter; enthalpy of neutralization, ionization, hydration and solution
- **CO7:** Correlate the heat capacity data to enthalpy data, Perform temperature corrections and Learn measurements at constant pressure conditions

Generic Elective Course(s) (GE) (I & IInd Sem) (Common Pool)

GE-1: Chemistry: Atomic Structure and Chemical Bonding (Semester I)

On completion of the course, the student will be able to:

CO1: Understands the modern concepts of atomic structure, concept of wave function, and Schrödinger equation for hydrogen atom

CO2: Gain knowledge on significance of quantum numbers, rules for filling electrons in various orbitals, concept of exchange energy and solve related conceptual questions

CO3: Solve conceptual questions on radial and angular distribution curves, and shapes of s, p, and d orbitals

CO4: Gain basic knowledge about ionic and covalent bonding, lattice energy, Born-Landé equation, Born Haber cycle and its applications

CO5: Insight into covalent character in ionic compounds, polarizing power and polarizability, Fajan's rules, dipole moment and percentage ionic character

CO6: Able to draw the structures and geometries of molecules using VBT, VSEPR theory, and MO diagrams (homo- & hetero-nuclear diatomic molecules)

CO7: Understands the rules for the LCAO method, concept of resonance, and idea of s-p mixing

CO8: Gains both practical and conceptual knowledge on titrimetric analysis especially on use of various indicators in acid-base titrations and principles of redox titrations.

CO9: Explain the theory, Estimations and application of iodo and iodometric titrimetric analysis.

CO10: Develop and understand about the Complexometric titrations using disodium salt of EDTA and estimation.

CO11: Paper chromatographic separation of metal ions, Inorganic preparation of Cuprous Chloride, Chromium potassium sulphate

GE-2: Chemistry of Oxygen containing Functional Groups and their Applications to Biology (Semester II)

On completion of the course, the student will be able to:

CO1: Explain the differential behavior of organic compounds based on reaction chemistry.

CO2: Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

CO3: Exploit the applications of functional group chemistry for biological applications.

Skill Enhancement Course (SEC) (Common Pool)

SEC1: BASIC IT TOOLS (Semester I)

On completion of the course, the student will be able to:

- **CO1:** Use word-processor to generate documents with appropriate formatting, layout, review and referencing.
- **CO2:** Manage data in worksheets and workbooks and analyze it using spreadsheet functions and inbuilt formulas.
- **CO3:** Draw analysis data using spreadsheets to make decisions.
- **CO4:** Make meaningful representations of data in the form of charts and pivot tables.
- **CO5:** Manage data in database tables and use the same for generating queries, forms and reports.

SEC2: FORENSIC CHEMISTRY (SEMESTER II)

On completion of the course, the student will be able to:

- **CO1:** Describe latent fingerprints, various methods of detection of latent fingerprints
- **CO2:** Collection and preservation of evidence from crime scenes.
- **CO3:** Detective dyes, alcohol and explosive analysis in forensic science

Value Addition Course (VAC) (Common Pool)

VAC1: NAME OF THE COURSE (SEMESTER): Not Applicable

VAC2: FIT INDIA (SEMESTER-II)

On completion of the course, the student will be able to:

- **CO1:** Adopt a healthy lifestyle.
- **CO2:** Understand the importance of nutrition, diet and psycho-physiological aspects of fitness.
- **CO3:** Do low intensity to high intensity work outs.
- **CO4:** Do work outs with target muscles and benefits.
- **CO5:** Have conciousness about diet and nutirition make them concious about their eating habits.
- **CO6:** Develop Self-esteem, Self-confidence, Self-discipline and team spirit as indicators of fitness.
- **CO7:** Guide others to some extent.

5. COURSE: B.COM. (HONS.)

DEPARTMENT: COMMERCE

Program Outcomes

Programme learning outcomes for B. Com. include various subject specific skills and generic skills like mind management, creativity, and innovation of competencies in diverse areas of Commerce and Business, the achievement of which will be demonstrated by the students of B.Com. Hons. for the award of bachelor degree. The programme learning outcomes of B. Com. also enable a student to prepare for further study, employment, and good citizenship. Further, the difference in the level of achievement of programme outreach provides for comparing of learning levels and standards across different college/institution. The various learning outcomes of the programme are mentioned below:

PO1: Bachelor's Degree in Commerce results in giving comprehensive knowledge of Marketing, Human Resource Management, Business and Corporate Law, Economics, Finance, Accounting, Management, Tax and several other branches of Commerce that includes Investment, Insurance, and Banking. Thus, this programme helps students in building a concrete footing for advanced studies in Commerce and to stand with the requirement of business sector, insurance, banking seeking youth fit for employment.

PO2: Students undergoing this programme will be equipped to the world of work, particularly, work of the future. The student will get a first-hand exposure of working in the real world.

PO3: Students completing this programme will be able to develop managerial knowledge and tactical dexterity, with a broader skill set and encourages them to seek out audacious, innovative solutions for today's business.

PO4: Completion of this programme will also enable the students to formulate business problems and provide innovative solutions thus, moulding them into future visionaries, management leaders that are compassionate yet efficient.

PO5: The course provides an extreme and rigorous base for teaching, research, and allied business administrations.

Course Outcomes: B.Com. (Hons.) (NEP UGCF 2022)

Core Course(s) 1st Year

DSC-1: Management Principles and Applications (Semester I)

The Learning Outcomes of this course are as follows:

- describe the various levels of management and applicability of management principles.

- evaluate a company's competitive landscape as per Porter's Five-force model.
- demonstrate various types of authority, delegation and decentralization in authority
- demonstrate various types of leadership styles and identify the motivation techniques used by leaders.
- discuss the impact of emerging issues in management.

DSC-2: Business Laws (Semester I)

The Learning Outcomes of this course are as follows:

- examine basic aspects of contracts vis-a-vis agreements and subsequently enter into valid business propositions.
- describe various modes of discharge of contract and remedies available in case of a breach.
- recognize and differentiate between the special contracts.
- analyse the rights and obligations under the Sale of Goods Act.
- apply skills to form and manage entrepreneurial ventures as LLP.

DSC-3: Financial Accounting (Semester I)

The Learning Outcomes of this course are as follows:

- apply the generally accepted accounting principles while recording transactions and preparing financial statements.
- demonstrate the accounting process under a computerised accounting system.
- measure business income applying relevant accounting standards.
- evaluate the impact of depreciation and inventories on Business Income.
- prepare the Financial Statements of sole proprietor firms and Not-For-Profit Organisations.
- prepare the accounts for Inland Branches, Departments and Leases.

BCH: DSC- 2.1: Corporate Accounting (Semester II)

After completion of the course, learners will be able to understand:

- Analyze the matters related to issues of share capital, debentures, bonus shares, redemption of preference shares and debentures of a company.
- Prepare financial statements of companies manually as well as using online software.
- Interpret the valuation of intangible assets and shares.
- Describe accounting for Amalgamation and Internal Reconstruction of Companies.

- Prepare annual reports of companies and analyze the voluntary and mandatory information contained in them.

BCH: DSC- 2.2: Company Law

After completion of the course, learners will be able to:

- Analyze the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act, 2013 and Rules.
- Prepare the basic legal documents and their usage essential for formation of a company.
- Analyze the process and documents required for raising capital for the company.
- Analyze the managerial composition of companies and examine the process of company meetings.
- Evaluate the framework of dividend distribution and develop understanding of the winding up process including Insolvency Resolution.

BCH: DSC- 2.3: Human Resource Management

After the completion of the course, the learners will be able to:

- Evaluate the importance of contemporary and emerging HR issues.
- Analyze the concept and sources of recruitment and selection process.
- Devise employee training and development programs.
- Design performance appraisal techniques and compensation schemes.
- Design HR policies for employee engagement and experience; grievance redressal, employee health, safety, welfare, and social security, for employees to attain stress-free work life balance.

Generic Elective Course(s) (GE) (Common Pool)

GE-1: BUSINESS ORGANISATION (Semester I)

The Learning Outcomes of this course are as follows:

- examine the dynamics of the most suitable form of business organisation in different situations.
- evaluate the various elements affecting the business environment.
- analyse business models for different organisations.
- record and report emerging issues and challenges of business organisations.
- evaluate changes in the working pattern of modern organisations

GE 2: FINANCE FOR EVERYONE (Semester I)

The Learning Outcomes of this course are as follows:

- explain the importance of financial literacy and the institutions providing financial services.
- prepare a financial plan, and budget and manage personal finances.
- avail and manage services offered by banks.
- avail and manage services offered by post offices.
- plan for life insurance and property insurance.
- choose instruments for investment in shares.

GE 3: Marketing for Beginners (Semester I)

- evaluate the companies following societal marketing concepts and along with their social initiatives.
- judge the segmentation of a product, service, event, or organisation of companies.
- analyse the process of value creation through marketing decisions involving product, pricing and distribution.
- compare the pricing strategies of various companies.
- explain marketing decisions involving product promotion and acquire knowledge about the various developments in the marketing area.

GE 4: Accounting for Everyone (Semester I)

The Learning Outcomes of this course are as follows:

- Analyze various terms used in accounting;
- Make accounting entries and prepare cash books and other accounts necessary while running a business;
- Prepare profit and loss account and balance sheet;
- Prepare accounts based on accounting software;
- Analyze information from the company's annual report.

GE- 5: COMPUTER APPLICATIONS IN BUSINESS (Semester I)

- describe the various concepts and terminologies used in computing, computer networks and the internet.

- examine document creation for report making and communication.
- identify and make good presentations.
- analyse various computations using various functions in the area of accounting and finance and represent the business data using suitable charts. s/he should also be able to manipulate and analyse the business data for a better understanding of the business environment and decision-making.
- identify the spreadsheet knowledge acquired through this paper in solving reallife problems that help in decision making.

GE- 6: Bhartiya Gyan Parampara (Indian Knowledge Systems) (Semester I)

The Learning Outcomes of this course are as follows:

- apportion the experience of the Gurukul system of education Indian culture
- explain the concept of oneness (Ekatma Bhav).
- use meditation on Panchkoshas and Chakras for enhancing productivity.
- apply the management principles from the epics and compare them with the policies and schemes of the Government of India.

GE 7: Basic Personal Taxation (Semester I)

The Learning Outcomes of this course are as follows:

- analyse the basic concepts of income tax and determine the residential status of different persons;
- compute income under the heads salaries and income from house property;
- compute income under the heads Profits and gains of business or profession and capital gains;
- compute income under the head income from other sources and understand the provisions relating to income of other persons included in assesses total income; and
- analyse various deductions and computation of total income and tax liability of individuals.

BCH: GE- 2.1: Communication in Management (Semester II)

After completion of the course, learners will be able to:

- analyse the need of communication in management.
- interpret the need for effective listening.

- examine the concepts of written and spoken communication.
- demonstrate the role of group discussion and interviews.
- summarise business reports and proposals.

BCH: GE- 2.2: Financial Management For Beginners (Semester II)

After completion of the course, learners will be able to:

- understand the overview of finance, the concept of time value of money and risk & return.
- learn financial analysis with the aid of various financial statements & analyse the capital budgeting process and techniques.
- analyse the cost of capital, capital structure and leverage.
- examine dividend & working capital dividend decisions.
- perform valuation of securities.

BCH: GE- 2.3: Sales Promotion (Semester II)

After completion of the course, learners will be able to:

- Evaluate the importance of sales promotion in marketing.
- Analyze the different forms of sale promotion.
- Design different tools for sales promotion campaign and analyze the need of a particular tool.
- Develop and evaluate sales promotion campaigns.
- Analyze the ethical and legal aspects of sales promotion.

BCH: GE- 2.4: Computerised Accounting System (Semester II)

After completion of the course, learners will be able to:

- Analyze the significance of accounting in an organization.
- Prepare and analyze financial statements.
- Create a structure of a computerised accounting system for a business firm.
- Record day to day business transactions in Computerised Accounting System
- Evaluate the necessary adjustments for Goods and Service Tax (GST) while recording business transactions
- Generate various accounting reports for analysis and decision making.

Value Addition Courses (VAC) (Common Pool)

VAC 1: FINANCIAL LITERACY (Semester I)

The Learning Objectives of this course are as follows:

- Familiarity with different aspects of financial literacy such as savings, investment, taxation, and insurance.
- Understand the relevance and process of financial planning
- Promote financial well-being

The Learning Outcomes of this course are as follows:

- Develop proficiency for personal and family financial planning
- Apply the concept of investment planning
- Ability to analyse banking and insurance products
- Personal tax planning

VAC 2: ETHICS AND CULTURE (Semester II)

The Learning Objectives of this course are as follows:

- To help students explore ethical and cultural dimensions of their lives.
- To provide a forum for students to pause, revisit their assumptions and beliefs, and become mindful of their thoughts, emotions and actions.
- To give the students an opportunity to express themselves and inquire into their decision making processes.
- To cultivate ethical values and participate in the creation of a society based on acceptance, compassion, and justice.

The Learning Outcomes of this course are as follows:

- Explore perspectives on ethics in thoughts, words and actions
- Evolve ethical decision making practises
- Understand the need for an ethical society and culture
- Introspect, become conscious of and assess one's stance in life
- Cultivate empathy, tolerance and compassion
- Apply the values learnt in the course to everyday life

Skill Enhancement Course(s) (SEC) (Common Pool)

SEC 1: DIGITAL MARKETING (Semester I)

The Learning Objectives of this course are as follows:

- To acquaint the students with the knowledge of growing integration between the traditional and digital marketing concepts and practices in the digital era.

- To familiarize the students with the tools and techniques used by the digital marketers for driving the marketing decisions to attain marketing objectives.

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to understand the concept of digital marketing and its integration with traditional marketing.
- After studying this course, students will be able to understand customer value journey in digital context and behaviour of online consumers.
- After studying this course, students will be able to understand email, content and social media marketing and apply the learnings to create digital media campaigns.
- After studying this course, students will be able to examine various tactics for enhancing a website's position and ranking with search engines.
- After studying this course, students will be able to leverage the digital strategies to gain competitive advantage for business and career.

SEC 2: PERSONAL FINANCIAL PLANNING (Semester II)

The Learning Objectives of this course are as follows:

- To familiarize students with different aspects of personal financial planning like savings, investment, taxation, insurance, and retirement planning.
- To develop the necessary knowledge and skills for effective financial planning.

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to understand the meaning and appreciate the relevance of financial planning.
- After studying this course, students will be able to understand the concept of investment planning and its methods.
- After studying this course, students will be able to examine the scope and ways of personal tax planning.
- After studying this course, students will be able to analyse insurance planning and its relevance.
- After studying this course, students will be able to develop insight into retirement planning and its relevance.

Core Course(s) 2nd Year

DSC-3.1: BUSINESS MATHEMATICS (Semester – III)

On successful completion of the course students will be:

- Assess the applicability of matrices as mathematical tools in representing a system of equations.
- Apply differential calculus to solve simple business problems.
- Evaluate business problems involving complex linear relationships between decision variables and their determining factors.
- Explain mathematical formulation and solution of problems related to finance including different methods of interest calculation, future and present value of money.
- Develop programming for business problems involving constrained optimisation.

DSC-3.2: FINANCIAL MANAGEMENT (Semester – III)

After completion of the course, a student will

- Analyse the conceptual framework of financial management and get an insight into the concept of time value of money, and risk and return.
- Estimate cash flows for projects, and evaluate their profitability using capital budgeting techniques.
- Estimate the cost of capital; and critically analyse different capital structure theories and factors affecting capital structure decision of a firm.
- Analyse different theories of dividend and factors affecting dividend policy.
- Estimate working capital requirements of a firm, and device optimum credit policy for a firm.

DSC-3.3: PRINCIPLES OF MARKETING (Semester – III)

After completion of the course, learners will be able to:

- Discuss basic concepts of marketing, marketing philosophies and environmental conditions affecting marketing decisions of a firm.
- Describe the dynamics of consumer Behaviour and process of market selection through STP.
- Analyse the process of value creation through marketing decisions involving product development.
- Analyse the process of value creation through marketing decisions involving product pricing and its distribution.

- Explore marketing decisions involving product promotion, and draft promotion mix strategies.

DSC-4.1: BUSINESS STATISTICS (Semester – IV)

After completion of the course, learners will be able to:

- Examine and understand the various descriptive properties of statistical data.
- Evaluate probability rules and concepts relating to discrete and continuous random variables to answer questions within a business context.
- Analyse the underlying relationships between the variables to use simple regressionmodels.
- Analyse the trends and tendencies over a period of time through time series analysis.
- Examine and apply index numbers to real life situations.

DSC-4.2: COST ACCOUNTING (Semester – IV)

After completion of the course, learners will be able to:

- Understand and analyse the different cost concepts.
- Analyse various components of cost of production.
- Compute unit cost and total cost by preparing a cost statement.
- Compute employee cost, employee productivity and employee turnover.
- Determine cost for different industries using job costing, process costing, contract costing and service costing.

DSC-4.3: INTERNATIONAL BUSINESS (Semester – IV)

After completion of the course, learners will be able to:

- Analyse the process of globalization and its impact on the growth of the international business.
- Evaluate the changing dynamics of the diverse international business environment.
- Analyse the theoretical dimensions of international trade as well as intervention measures adopted.
- Analyse the significance of different forms of regional economic integration and the role played by various international economic organisations.
- Evaluate the forms of foreign direct investment and analyse the benefits and costs of FDI

Core Course(s) 3rd Year

DSC-5.1: INCOME TAX LAW AND PRACTICE (Semester – V)

After completion of the course, learners will be able to:

- Analyse the basic concepts of income tax and determine the residential status of different persons.
- Compute income under the heads 'salaries' and 'income from house property'.
- Compute income under the heads 'profits and gains of business or profession' and 'capital gains'.
- Compute income under the head 'income from other sources' and understand the provisions relating to clubbing of income and set-off losses.
- Analyse various deductions and computation of total income and tax liability of Individuals.

DSC-5.2: BUSINESS ECONOMICS (Semester – V)

After the completion of the course, the learners will be able to:

- Examine the nature and scope of business economics.
- Analyse how consumers try to maximize their satisfaction by spending on different goods.
- Evaluate the relationship between inputs used in production and the resulting outputs and costs.
- Analyse and interpret various facets of and pricing under different market situations.
- Discuss the contemporary issues and applications in micro economics.

DSC-5.3: MANAGEMENT ACCOUNTING (Semester – V)

After completion of the course, learners will be able to:

- Examine the conceptual framework of Management Accounting and identify the differences between various forms of accounting.
- Analyse budgetary control system as a tool of managerial planning and control
- Evaluate the standard costing system as a tool of managerial control.
- Recognise the concept of marginal costing and cost-volume-profit analysis.
- Analyse techniques of decision making.
- Discuss the concept of responsibility accounting and performance measurement.

DSC-6.1: BUSINESS ANALYTICS (Semester – VI)

After completion of the course, the learners will be able to:

- Describe skills for computation and aggregation of data using spreadsheets.
- Analyse data with the help of pivot tables and pivot charts.
- Analyse data using R packages and interpret the results.
- Compare linear regression models using spreadsheet & R and interpret the results.
- Examine textual data analysis using R

DSC-6.2: CORPORATE GOVERNANCE (Semester – VI)

After completion of the course, learners will be able to:

- Describe the concept and significance of corporate governance in a business setup.
- Analyse the role of the board of directors.
- Discuss important dimensions in corporate governance.
- Analyse global corporate failures; understand international codes and its implications.
- Discuss corporate governance regulatory framework in India.
- Assess and analyse the problems of corporate governance in Indian Inc.

DSC-6.3: GOODS AND SERVICES TAX (GST) AND CUSTOMS LAW (Semester – VI)

After completion of the course, learners will be able to:

- Analyse the rationale of Goods and Services Tax (GST), constitutional amendment carried out to install GST in India and comprehend the composition and working of GST council.
- Interpret the meaning of supply under GST law, differentiate between intra-state and inter-state supply, provisions related to place of supply, time of supply and compute the value of supply.
- Evaluate the utilization of input tax credit and the provisions of reverse charge mechanism.
- Analyse various returns under GST and payment of taxes.
- Evaluate the concepts of Customs Act, various custom duties and computation of the assessable value for charging customs duty.

Discipline Specific Elective Course(s) (DSE) 2nd Year

DSE-3.1: ORGANISATIONAL BEHAVIOUR (Semester III)

After completion of the course, learners will be able to:

- Discuss basic concepts of organisational behaviour and their applicability in contemporary organisations.

- Analyse various means of managing people at the workplace.
- Recognise the importance of communication and motivation in an organisation.
- Critically evaluate the different leadership styles and strategies.
- Summarise the ways to build supportive organisational culture.

DSE-3.2: FINANCIAL MARKETS AND INSTITUTIONS (Semester III)

After completion of the course, learners will be able to:

- Describe the components and functions of a financial system.
- Analyse integration and linkages between different financial systems and describe how they operate.
- Analyse the functioning and working of money and capital markets.
- Describe the functioning and role of various financial institutions.
- Assess global financial markets and institutions, and spill over of financial crisis across countries.

DSE-3.4: FINANCIAL REPORTING ANALYSIS & VALUATION (Semester III)

After completion of the course, learners will be able to:

- Analyse and interpret the information provided in the financial statements of a company.
- Evaluate the results of financial statements and disclosures of corporate annual reports.
- Apply principles valuation to tangible and intangible assets.
- Identify the elements of financial statements.
- Summarise the emerging areas in financial reporting.

DSE-4.1: HUMAN RESOURCE DEVELOPMENT (Semester IV)

After completion of the course, learners will be able to:

- Examine the evolution of HRD.
- Analyse the role of HRD strategies in organisations.
- Apply and evaluate a learning process starting with training needs, analysis, assessment and evaluation process.
- Explore the role of training needs of employees.
- Evaluate the training methods used in industry.

DSE-4.2: INVESTMENT MANAGEMENT (Semester IV)

After completion of the course, learners will be able to:

- Analyze the environment of investment and risk return framework.
- Describe bonds in terms of valuation, yields, and risks.
- Analyse equity shares using different approaches and models.
- Construct, analyse, select and evaluate portfolios along with a deep understanding of capital market theory and associated models.
- Comprehend and analyse futures and options and to be able to devise own investment strategies using various options trading strategies in the derivative market.

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-5.2: INTERNATIONAL FINANCE (Semester V)

After completion of the course, learners will be able to:

- Describe the International Monetary System and the nature and scope of international finance.
- Discuss various aspects of Foreign Exchange Markets.
- Analyse the factors affecting the exchange rates.
- Describe International Financial Markets and Instruments.
- Evaluate various kinds of risks due to fluctuation in the exchange rate and management of these risks.

DSE5.3:CONSUMER AFFAIRS AND SOVEREIGNTY (Semester V)

After completion of the course, learners will be able to:

- Describe the concept of consumer and post-purchase voicing of consumer grievances.
- Demonstrate how to exercise the consumer rights provided under Consumer Protection Act, 2019.
- Discuss the filing, hearings, and appeal provisions.
- Identify the role of industry regulators in consumer protection.
- Discuss the recent developments in consumer protection in India.

DSE5.6: EXPORT IMPORT MANAGEMENT (Semester V)

After completion of the course, learners will be able to:

- Analyse the basics of export-import management in India.
- Recognise the export-import procedure.

- Evaluate various export incentives and schemes designed for business firms and exporters.
- Discuss the legal framework of custom law.
- Discuss Government schemes to promote export competitiveness.

Generic Elective Course(s) (GE) (Common Pool) 2nd Year

GE-3.3: INVESTING IN STOCK MARKETS (Semester III)

After completion of the course, learners will be able to:

- Evaluate the investment environment as well as risk & return framework.
- Conduct fundamental analysis to identify under-priced/overpriced securities.
- Conduct technical analysis to make buy and hold decisions in the stock market.
- Describe the functioning of Indian Stock Market.
- Analyse mutual funds as an investment alternative.

GE-4.1: BASICS OF ORGANISATION BEHAVIOUR (Semester IV)

After completion of the course, learners will be able to:

- Analyse the working of organisations and human Behaviour.
- Apply the concepts of OB in managing people at the workplace.
- Critically evaluate the role of motivation theories in guiding human behaviour.
- Recognise diverse leadership styles and strategies.
- Summarise the ways to build supportive organisational culture.

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5.1: FUNDAMENTALS OF HUMAN RESOURCE MANAGEMENT (Semester V)

After completion of the course, learners will be able to:

- Examine the organisational human resource processes.
- Compare job analysis, job description, and job design.
- Evaluate the relevance and methods of training and development.
- Recognise the requisite skills in performance appraisal and compensation of employees.
- Analyse the need of Employee Maintenance in the organization and study the Emerging issues in HRM.

Skill Enhancement Course (SEC) (Common Pool)

SEC 98: INNOVATION AND ENTREPRENEURSHIP (Semester – III)

On successful completion of the course students will be:

- Identify and comprehend the concepts of creativity, innovation and invention in various contexts.
- Enrich their theoretical and conceptual foundations in entrepreneurship.
- Gain hands-on experience that shall empower them to identify business and social opportunities and venture in the entrepreneurial landscape.
- Prepare themselves to take informed decisions in establishing start-ups and ongoing innovation in organisations
- Work as a team

SEC 107: YOGA IN PRACTICE (Semester-IV)

On successful completion of the course students will be:

- Student will form an understanding of the concept of yoga.
- Students will learn various aspects of the science of yoga.
- Theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

SEC 106: PERSONAL FINANCE PLANNING (Semester-V)

On successful completion of the course students will be:

- Examine the meaning and appreciate the relevance of financial planning.
- Demonstrate the concept of investment planning and its methods.
- Examine the scope and ways of personal tax planning.
- Analyse insurance planning and its relevance.
- interpret insight into retirement planning and its relevance.

Value Addition Course(s) (VAC) (Common Pool)

VAC 5: EMOTIONAL INTELLIGENCE (Semester – III)

On successful completion of the course students will be:

- Self-Awareness, Self-Management, Social Awareness & Relationship Management.
- Discover personal competence and techniques of building emotional intelligence.
- Gain insights into establishing positive relationships.

VAC 4: DIGITAL EMPOWERMENT (Semester-IV)

On successful completion of the course students will be:

- Use ICT and digital services in daily life.
- Develop skills to communicate and collaborate in cyberspace using social platforms, teaching/learning tools.
- Understand the significance of security and privacy in the digital world.
- Evaluate ethical issues in the cyber world

6. COURSE: B.A. (HONS.) ECONOMICS

DEPARTMENT: ECONOMICS

Program Outcomes

The courses offered by the Economics Department provide a rigorous basis for much of the advanced thinking in the Economics discipline.

PO1: It provides the student with a logical paradigm for conceptualising and interpreting the behaviour and interactions of households, firms, and government institutions.

PO2: The curriculum allows students to choose elective courses from a set of courses with contemporary relevance, thereby offering students the flexibility to prepare for careers in academia, law, management, journalism, government, and many other fields.

PO3: The programme is consistent with global standards in the Economics discipline.

PO4: It offers training that is comparable to that of an undergraduate student at the world's best universities.

Course Outcomes: B.A. (Hons.) Economics (NEP UGCF 2022)

Core Course(s) 1st Year

ECON001: Introductory Microeconomics (Semester-I)

This course is designed to expose students to the basic principles of microeconomic theory. The emphasis will be on teaching the fundamental economic trade-offs and allocation problems due to scarcity of resources. This course will use graphical methods to illustrate how microeconomic concepts can be applied to analyse real-life situations. The course learning outcomes are as follows:

- Students will learn to think about economic trade-offs and opportunities.
- They will learn the fundamentals of market mechanisms and government interventions.

ECON002: Introductory Mathematical Methods for Economics (Semester-I)

This is the first of a compulsory three-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The sophistication would be maintained at a standard level to grow in the profession. The course learning outcomes are as follows:

- The course hones and upgrades the mathematical skills acquired in school and paves the way for the second semester course Intermediate Mathematical Methods.
- The analytical tools introduced in this course have applications wherever unconstrained optimisation techniques are used in economics and business decision-making.
- These tools are necessary for anyone seeking employment as an analyst in the corporate world.
- The course additionally makes the student more logical in making or refuting arguments.

ECON003: Introductory Statistics for Economics (Semester-I)

The course familiarizes students with methods of summarizing and describing important features of data. The course teaches students the basics of probability theory and sets a necessary foundation for Inferential Statistical Theory and the Econometrics courses. The familiarity with probability theory will also be valuable for courses in economic theory. The course outcomes are as follows:

- The student would understand the concept of probability, random variables and their distributions and become familiar with some commonly used discrete and continuous distributions of random variables so that they would be able to analyse various real-life data.

ECON004: Core Introductory Macroeconomics (Semester-II)

This course introduces students to the basic concepts of macroeconomics. It discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variables like GDP, savings, investment, money, inflation, unemployment and the balance of payments. It also introduces the simple analytical framework (e.g., the IS-LM model) for analysing the relationships among key macroeconomic variables. The course outcomes are as follows:

- The students would be able to familiarise the broad macroeconomic concepts like GDP, inflation, money supply, interest rate and their inter-linkages and their interrelationships.
- It will also allow them to critically evaluate various macroeconomic policies and their effects on output and interest rate in the economy.

ECON005: Intermediate Mathematical Methods for Economics (Semester-II)

This course is the second part of a compulsory three-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically for the courses on microeconomic theory, macroeconomic theory, statistics and econometrics. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The course outcomes are as follows:

- The course builds the mathematical foundations necessary for further study of a variety of disciplines including postgraduate economics, statistics, computer science, finance and data analytics.
- The analytical tools introduced in this course have applications wherever optimization techniques are used in business decision-making for managers and entrepreneurs alike.
- These tools are necessary for anyone seeking employment as an analyst in the corporate world.

ECON006: Intermediate Statistics for Economics (Semester-II)

This course focuses on techniques for statistical inference. The main objective of the course is to help students understand how to draw inference from samples regarding the underlying populations using point estimation, interval estimation and hypothesis testing. The course outcomes are as follows:

- An important learning outcome of the course will be the capacity to use and analyse statistics in everyday life.
- The course will improve students' ability to analyse data, make decisions, form predictions, and conduct research.

Generic Elective Course(s) (GE) (Common Pool)

ECON025: Principles of Microeconomics I (Semester-I)

This course discusses the basic principles in Microeconomics and their applications. It includes consumer's problem, demand estimation, production function, cost functions and market analysis. It illustrates how the concepts of microeconomics can be applied to analyze real-life economic situations. The course outcomes are as follows:

- The students learn some basic principles of microeconomics of consumer and producers, and interactions of supply and demand, characteristics of perfect competition, efficiency and welfare outcomes.

ECON029: Basic Development Economics (Semester-I)

This course exposes students to some of the key ideas and concepts in the areas of economic growth, human development and globalisation building on the concept of growth and further links it up with alternative conceptions of development. The course outcomes are as follows:

- Students will develop a critical understanding of the contemporary issues in economic growth and development and their paths.
- Students will thus be better prepared to face the professional world and can use this knowledge base in a variety of jobs, including in the corporate, civil service and NGO sectors.

ECON026: Principles of Macroeconomics I (Semester-II)

This course introduces the basic concepts in Macroeconomics both in closed and open economy. It deals with the behaviour and characteristics of aggregate economy. This course introduces the definition, measurement of the macroeconomic variables like GDP, consumption, savings, investment and balance of payments. The course also discusses various theories and approaches of determining GDP. The course outcomes are as follows:

- The students will learn the broad understanding of macroeconomic variables and their measurement issues like GDP, inflation, money supply, interest rate and their interlinkages.
- It will also allow them to critically evaluate various macroeconomic policies and their effects on output and interest rate in the economy.

Skill Enhancement Course(s) (SEC)

Digital Marketing (Semester-I)

This course aims to acquaint the students with the knowledge of growing integration between the traditional and digital marketing, concepts and practises in the digital era. It also familiarises the students with the tools and techniques used by the digital marketers for driving the marketing decisions to attain marketing objectives. The learning outcomes of the course are as follows:

- After studying the course, students will be able to understand the concept of digital marketing and its integration with traditional marketing.

- After studying this course, students will be able to understand customer value journey in digital context and behaviour of online consumers.
- After studying this course, students will be able to understand email, content and social media marketing and apply the learnings to create digital media campaigns.
- After studying this course, students will be able to examine various tactics for enhancing the websites position and the ranking with search engines.
- After studying this course, students will be able to leverage the digital strategies to gain competitive advantage for business and career.

Social Media Marketing (Semester-II)

This course aims to provide basic knowledge of social media marketing concepts and to enhance skills as social media marketer and start a career in social media marketing. After completion of the course, learners will be able to:

- Evaluate the role of social media and marketing, advertising and public relations.
- Assess the optimal use of various social media platforms for social media marketing.
- Analyse the importance of social media for developing an effective marketing plan, and assess ways to measure its performance.
- Describe practical skills required for creating and sharing content through online communities and social networks.
- Demonstrate and appreciate social media ethics to use social media spaces effectively.

Value Addition Course(s) (VAC) (Common Pool)

Financial Literacy (Semester-I)

The course intends to develop familiarity with different aspects of financial literacy, such as savings, investment, taxation and insurance and understand the relevance and process of financial planning, to promote financial well-being. The course learning outcomes of this course are as follows:

- Develop proficiency for personal and family financial planning.
- Apply the concept of investment planning.
- Ability to analyse banking and insurance products
- Personal tax planning

Digital empowerment (Semester-II)

The course has been designed to understand the digital world and need for digital empowerment and create awareness about digital India. It tries to impart awareness on cyber safety and security. After the completion of this course, students will be able to

- Use ICT and digital services in daily life.
- Communicate and elaborate in cyberspace using social platforms, teaching/learning tools.
- Understand the significance of security and privacy in the digital world.
- Recognise ethical issues in the cyber world.

Core Course(s) 2nd Year

DSC-7: Advanced Mathematical Methods for Economics (Semester – III)

On successful completion of the course students will be:

- prepared for further study of a variety of disciplines including postgraduate economics, statistics, computer science, finance and data analytics.
- The analytical tools introduced in this course have applications wherever optimization techniques are used in business decision-making for managers and entrepreneurs alike.
- These tools are necessary for anyone seeking employment as an analyst in the corporate world.

DSC-7: INTERMEDIATE MICROECONOMICS I: BEHAVIOURAL FOUNDATIONS OF MARKET INTERACTIONS (Semester – III)

After completion of the course, a student will

- Be able to formally analyse the behaviour of individual agents like consumers and producers under certain conditions
- The student will be able to use mathematical tools to facilitate the understanding of the basic concepts.
- This course will look at the behaviour of the consumer and the choices of the competitive firm
- Students will learn the basic elements of consumption and production theories using various technical frameworks.
- This course also provides them the behavioural foundations of market supply

DSC-10: Intermediate Microeconomics II: Market, Government and Welfare

Learning outcomes:

- This course introduces students to analysis of multi-commodity markets.
- The efficiency results, known as welfare theorems, are central to understanding of market economy.
- The course also discusses inefficiencies coming from market concentration and externalities.
- It further would discuss the role of government to deal with the inefficiencies and resultant welfare outcomes.

DSC-11: Intermediate Macroeconomics II: Policy Issues

Learning outcomes:

- This course trains the students in policy issues faced by macroeconomists in the real world
- It discusses issues in monetary and fiscal policies as well as exchange rate dynamics. It also introduces the students to the financial system and dynamics of financial crises.
- The students are introduced to macroeconomic concepts in the context of open economies and the policy issues therein

DSC-12: Introductory Econometrics

Learning outcomes:

- This course introduces a basic set of the econometric methods to conduct empirical analysis in economics and social sciences.
- The course is designed to provide the students with the basic quantitative techniques needed to undertake applied research projects.
- It also provides the base for more advanced optional courses in econometrics.
- The tools of econometrics will be useful to establish relationships among economic variables.
- This course will be taught as a combination of theory and practicals

Discipline Specific Elective Course(s) (DSE)

DSE-3: Fiscal Policy and Public Finance in India (Semester III)

- The students would learn the needs and objectives of government expenditure on social and environmental schemes and critically evaluate them.
- The student will understand the new concepts of budgeting and analyse the fiscal and debt management policies of the government through an environmental perspective.
- They will also learn the vast mechanism of fiscal federalism in India and the role and contribution of the Finance Commission in achieving equity and efficiency in resource allocation at multiple levels of government.

DSE-4: Financial Economics – ECON04

After studying this course, the student will be able to:

- Understand the basic concepts of finance and financial variables.
- They would develop an understanding of basics of finance including interest rates, annuity, and cash flow.
- The analytical approach adopted in this paper will strengthen and channelise their skills for more advance approaches in finance.

Generic Elective Course(s) (GE) (Common Pool)

GE-3: MONEY AND BANKING (Semester III)

After completion of the course, a student will understand

- Measurement of money supply
- Analytics and Methodology of computation of money supply,
- Money supply determination
- Functions and working of an efficient financial market
- Monetary management in an open economy

GE-4: Theory of Public Finance – ECON061

After studying this course, the student will be able to:

- This course aims to develop the broad conceptual frameworks which will enable students to learn economic issues efficiency, equity, public goods, externalities, taxation, subsidies, fiscal multiplier, money supply, interest rate and their interlinkages
- It will also allow them to critically evaluate various micro and macro aspects of government policies and their effects on output, distribution, and welfare in the economy.

- The course will be useful for students aiming towards careers in the government sector, policy analysis, business and journalism.

Skill Enhancement Course (SEC) (Common Pool)

SEC3: BASIC IT TOOLS (Semester-III)

After studying this course, the student will be able to:

- Learn to create, manage, and secure spreadsheets while using formulas and in-built functions.
- Analyse data using charts, pivot tables, and automate tasks with macros.
- To use a word-processor to generate documents with appropriate formatting, layout, review and referencing.
- To manage data in database tables and use the same for generating queries, forms and reports.

SEC 4: Basic IT Tools II (Semester-IV)

After studying this course, the student will be able to:

- Learn to create, manage, and secure spreadsheets while using formulas and in-built functions.
- Analyse data using charts, pivot tables, and automate tasks with macros.
- To use a word-processor to generate documents with appropriate formatting, layout, review and referencing.
- To manage data in database tables and use the same for generating queries, forms and reports.

Value Addition Course(s) (VAC) (Common Pool)

VAC3: DIGITAL EMPOWERMENT (Semester-III)

After studying this course, the student will be able to:

- Understand the digital world and need for digital empowerment
- Create awareness about Digital India
- Explore, communicate and collaborate in cyberspace
- Imparting awareness on cybersecurity and security
- Use ICT and Digital services in daily life
- Communicate and collaborate in cyberspace using social platforms, teaching/ learning tools

- Understand the significance of security and privacy in digital world
- Recognise ethical issues in cyber world

VAC4: DIGITAL EMPOWERMENT (Semester-IV)

After studying this course, the student will be able to:

- Understand the digital world and need for digital empowerment
- Create awareness about Digital India
- Explore, communicate and collaborate in cyberspace
- Imparting awareness on cybersecurity and security
- Use ICT and Digital services in daily life
- Communicate and collaborate in cyberspace using social platforms, teaching/ learning tools
- Understand the significance of security and privacy in digital world

Core Course(s): 3rd Year

DSC-13 Game Theory and Stratergic Interactions (Semester – V)

On successful completion of the course students will:

1. Understand strategic interactions and importance of information in strategic situations.
2. Will be enabled to analyze various strategic relations seen in various disciplines, like in economics, management and other social sciences.

DSC-14. Development Economics

On successful completion of the course students will be able to understand:

- alternative concepts of development, the process of economic development, and factors affecting the level of economic development
- concepts and measurement of underdevelopment including poverty and inequality
- political institutions and growth and inequality; the role of the state and issues relating to governance

DSC-15: International Trade – ECON016 (Semester – VI)

Learning Outcomes:

- This course introduces the basics of international trade theory and examines the effects of trade policies for domestic and world welfare.
- It covers bother classical and new trade theories.

- This course develops a systematic exposition of models that try to explain the composition, direction, and consequences of international trade.
- Apart from the introduction to theoretical models, students will also be exposed to real-world examples and case studies.

DSC-16: Development Theory and Experience – ECON017 (Semester – VI)

Learning Outcomes:

- It highlights the dynamic interconnections between the social and economic aspects of the development process.
- In particular, the course deals with the macro and micro aspects of demography, fertility choices and gender bias.
- It also discusses the process of migration through elaborate models highlighting the rural-urban sectoral interrelationships.
- It describes the peculiar characteristics of rural institutions which shape contracts across labour, land and credit markets in the rural economy.
- It discusses the efficiency of such contracts even while they deviate from the traditional competitive market contracts

DSC-17: Indian Growth and Development (Semester – VI)

Learning Outcomes:

- Using appropriate analytical frameworks, this course reviews major trends in economic indicators of macro and development issues and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points.
- This course intends to give an introduction to students as to how they could explore problems related to the Indian economy by familiarizing them with the research studies on areas relating to economic development and policy in India with an emphasis on contemporary debates

Discipline Specific Elective Course(s) (DSE)

DSE-5: Fiscal Policy and Public finance in India (Semester – V)

On successful completion of the course students will be:

1. Students would learn the needs and objectives of government expenditure on social schemes and critically evaluate them.

2. Students will understand the new concepts of budgeting and analyse the fiscal and debt management policies of the government.
3. Understand the mechanism of fiscal federalism in India along with role of finance commission

DSE-6: Environmental Economics (Semester – V)

On successful completion of the course, students will be:

- Learning the fundamental principles of environmental economics, including the theory of externalities, market-based and regulatory policy instruments, and methods for valuing environmental benefits.
- It explores the design and implementation of environmental policies, including taxes, permits, and regulations.
- The course also examines international environmental issues, benefit measurement methods, and sustainable development, with a focus on practical applications and current environmental challenges

DSE-7: Open Economy Macroeconomics

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

- Explain exchange rate determination in short-run and long-run
- Describe the working of monetary and fiscal policy under the fixed Vs. flexible exchange rates in the short-run
- Identify the benefits of fixed exchange rates
- Illustrate the causes of breakdown of fixed (i.e. peg) exchange rate
- Analyse exchange rate crises
- Discuss the behaviour of exchange rates vis-a-vis theoretical predictions
- Review the International monetary system

DSE-6: Money and Financial Markets – ECON047 (Semester – VI)

Learning Outcomes:

- This course exposes the theory and functioning of the monetary and financial sectors of the economy.
- It highlights the organization, structure, and role of financial markets and institutions
- It also discusses interest rates, monetary management, and instruments of monetary control.

- Financial and banking sector reforms and monetary policy with special reference to India are also covered.

DSE-19: Behavioural Economics

Learning Outcomes:

- This course equips students to contrast the outcomes of standard classical microeconomic theories with real outcomes, to apply the theories that explain anomalies/deviations from rational predicted behaviour
- It communicates the basic theories of behavioural economics cogently and critically Final Examination in the findings from experiments in terms of their applicability to public policy settings.

DSE-20: Comparative Economic Development – ECON050

Learning Outcomes:

- The students will be able to learn critical factors affected economic development in a historical perspective and assimilate materials from diverse narratives.
- It will help them to think in an interdisciplinary manner.

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5: Education and Development (Semester V)

On successful completion of the course students will be:

- Able to determine the present value of investment in education
- Understand the basic correlation between education parameters and economic development through case studies
- Forecast the impact of higher education on GDP per capita.

GE-6: Principles of Macroeconomics II – ECON028 (Semester VI)

Learning Outcomes:

- The students would learn an analytical framework to analyse the basic functioning of the aggregate macroeconomy under closed and open economy.
- It also enables them to analyse the functioning of the economies in term of the effects of fiscal and monetary policy and trade-off between inflation and unemployment

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC5: Finance for Everyone (Semester-V)

On successful completion of the course students will be able to:

- understand the importance of financial literacy, the need for financial planning, and preparing a budget
- effectively manage one's finances, make informed financial decisions, and achieve financial goals
- effectively manage financial products related to banking services, post office and insurance policies
- understand basic concepts, develop analytical skills and investment strategies related to stock markets

SEC 6: Working with People (Semester-VI)

At the end of the semester the students will be able to

- Develop a practical understanding of using different skills while working with individuals and groups
- Develop skills and competencies to work effectively in field settings
- Acquire understanding about self, goal setting, networking, and communication.

7. COURSE: B.SC. (HONS.) ELECTRONICS

DEPARTMENT: ELECTRONICS

Program Outcomes

Course Outcomes: B.SC. (Hons.) Electronics (NEP UGCF 2022)

Core Course(s) (1st Year)

ELDSC 1: Programming Fundamentals Using Python (Semester I)

This course aims to introduce the student to the fundamental understanding of the Python programming language. To help students learn to use the Python programming language to solve problems of interest to them. To introduce the core programming basics including data types, operators, input/output, control structures, iterative and recursive constructs, compound data types, and program design with functions. To discuss the fundamental principles of Object-Oriented Programming (OOP), as well as comprehensive data and information processing techniques. After completion of the course, students will be able to

- Read, write and debug Python programs to solve computational problems.
- Select and use a suitable programming construct and data objects like lists, sets, tuples and dictionaries for solving a given problem.
- Be proficient in the handling of strings and functions.
- Use Python libraries.
- Articulate OOP concepts such as encapsulation, inheritance and polymorphism and use them in applications

ELDSC 2: Circuit Theory and Network Analysis (Semester I)

The Learning Objectives of this course are: To study the basic circuit concepts in a systematic manner suitable for analysis and design. To study the steady state analysis of AC Circuits. To study and analyse electric circuits using network theorems. To study and design passive filters using R, L and C. After completion of the course, students will be able to

- Study basic circuit concepts in a systematic manner suitable for analysis and design.
- Determine AC steady state response.
- Analyse the electric circuit using network theorems.
- Determine frequency response of filters.

ELDSC 3: Semiconductor Devices (Semester I)

The Learning Objectives of this course are: To understand the Physics of semiconductor devices. To be able to plot and interpret the current-voltage characteristics for basic semiconductor devices. The student should be able to understand the behaviour, characteristics and applications of power devices such as SCR, UJT, DIAC, TRIAC, IGBT. After completion of the course, students will be able to:

- Describe the behaviour of semiconductor materials.
- Reproduce the I-V characteristics of diode/BJT/MOSFET Devices.
- Apply standard device models to explain/calculate the critical internal parameters of semiconductor devices.
- Explain the behaviour and characteristics of power devices such as SCR/UJT etc.

ELDSC 4: Basic Instrumentation and Measurement Techniques (Semester II)

The objective of this subject is to provide insight into electronic instruments being used in the industries and labs. It details the basic working and use of different instruments used for measuring various physical quantities. It also, details the identification, classification, construction, working principle and applications of various transducers used for displacement, temperature, pressure and intensity measurement. After completion of the course, students will be able to

- Describe the working principle of different measuring instruments.
- Choose appropriate measuring instruments for measuring various parameters in their laboratory courses.
- Understand the significance of different measuring instruments including oscilloscopes.

ELDSC 5: Digital Electronics (Semester II)

The Learning Objectives of this course are: To represent information in various number systems. To convert data from one number system to another and do various arithmetic operations. To analyze logic systems and to implement optimized combinational circuits using Karnaugh Map. To analyze and implement sequential circuits using state machines.To analyze various memories and programmable logic devices. To analyze and understand the working of data converters. After completion of the course, students will be able to

- Understand the concept of the number system with emphasis on binary numbers, its algebra and minimization techniques.

- Understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions.
- Analyze and design combinational as well as sequential circuits.
- Understand the concepts related to Memories and PLD‘s.
- Understand the working of analog to digital converters, digital to analog converters

ELDSC 6: Analog Electronics-I (Semester II)

The Learning Objectives of this course are: Understand diodes (pn diode and Zener diode) and its applications in clipping and clamping circuits, rectifiers and voltage regulation (using Zener diodes) and concept of Power Supply. Understand frequency response of BJT and MOSFET amplifiers. Understand the concept of feedback and design feedback amplifiers and oscillators. Understand different power amplifiers and single tuned amplifiers. After completion of the course, students will be able to

- Illustrate about rectifiers, transistor and MOSFET amplifiers and its biasing. Also compare the performances of its low frequency models.
- Describe the frequency response of MOSFET and BJT amplifiers.
- Explain the concepts of feedback and construct feedback amplifiers and oscillators.
- Summarizes the performance parameters of amplifiers with and without feedback.

Generic Elective(s) (Common Pool) (1st Year)

GE 1: Data Engineering and Analytics (Semester I)

The objective of this course is to introduce students to data analysis and impart them solve data analytics problem. Data Engineering is basically designing and building pipelines that transform and transport data into a highly usable format before it reaches the data scientists or end users. These pipelines must take data from many disparate sources and collect them into a single warehouse that represents the data uniformly as a single source of truth. After completion of the course, students will be able to:

- Use data analysis tools in the pandas library
- Develop understanding of basic data analysis techniques
- Collect, explore, clean, munge, and manipulate data
- Solve real world data analysis problems
- Build data science applications using python based toolkits

GE 2: Data Visualization (Semester II)

This course is all about Data Visualization, the art and science of turning data into readable graphics. It enables the students to design and create data visualizations based on data available and tasks to be achieved. This process includes data modeling, data processing (such as aggregation and filtering), mapping data attributes to graphical attributes, and strategic visual encoding based on known properties of visual perception as well as the task(s) at hand. Students will also learn to evaluate the effectiveness of visualization designs, and think critically about each design decision, such as choice of colour and choice of visual encoding. Students will create their own data visualizations and learn to use Open-Source data visualization tools. After completion of the course, students will be able to:

- Design and create data visualizations.
- Conduct exploratory data analysis using visualization.
- Craft visual presentations of data for effective communication.
- Use knowledge of perception and cognition to evaluate visualization design alternatives.
- Design and evaluate color palettes for visualization based on principles of perception.
- Apply data transformations such as aggregation and filtering for visualization.
- Identify opportunities for application of data visualization in various domains.

Skill Enhancement Course(s) (SEC) (Common Pool) (1st Year)

SEC 1: Analytics/Computing with PYTHON (Semester I)

The Learning Objectives of this course are: To introduce machine learning techniques to students using python programming. To enable students to use various tools and packages for advanced data analysis. The learning outcomes of this course are as follows:

- After studying this course, students will be able to learn about python's main features and how they make python a great tool for financial analysts.
- After studying this course, students will be able to get familiarized with anaconda and jupyter notebook.
- After studying this course, students will be to learn basics of machine learning
- After studying this course, students will be able to apply these techniques on data.

SEC 2: R Programming for Data Analytics (Semester II)

The Learning Objectives of this course are: To introduce the basic concepts in R programming. To equip the students with the popular statistical programming language R. To

familiarize the students with utility of 'R' for managerial decision making. The learning outcomes of this course are as follows:

- Learn Syntax and Semantics of R Programming
- Understand the file system and data handling in R.
- Visualize and analyse the data using statistical methods.
- Apply best practice model design methodologies to real problems using R.

Value Addition Courses (VAC) (Common Pool) (1st Year)

VAC 1: Digital Empowerment (Semester I)

The Learning Objectives of this course are as follows:

- To understand the digital world and need for digital empowerment
- To create awareness about Digital India.
- To explore, communicate and collaborate in cyberspace.
- To build awareness on cyber safety and security.

The learning outcomes of this course are as follows:

- Use ICT and digital services in daily life.
- Develop skills to communicate and collaborate in cyberspace using social platforms, teaching/learning tools.
- Understand the significance of security and privacy in the digital world.
- Evaluate ethical issues in the cyber world

VAC 2: Social and Emotional Learning (Semester II)

The Learning Objectives of this course are as follows:

- To develop social and emotional awareness in students and initiate them towards better personal and social well-being.
- To create an awareness towards self, others, the environment and their harmonious coexistence.

The learning outcomes of this course are as follows:

- Become aware of oneself and the society.
- Make informed lifestyle choices and extend the self in the joy of giving.
- Develop empathy, compassion, connect with nature and evolve emotionally to create a more harmonious society.

- Cultivate sensitivity towards discriminatory practices and explore possible solutions.

Core Course(s) (2nd Year)

DSC -7: Engineering Mathematics (Theory + Practicals) (Semester III)

The Learning Outcomes of this course are as follows:

- Use the Mathematical tools to solve/model the problems related to Electronics
- Solve linear differential equations using a variety of techniques, power series methods and special functions.
- Understand how to solve N coupled equations matrices, concept of Eigenvalues and Eigenvectors.
- Familiarize with the concept of sequences and series, convergence and divergence
- Appreciate the complex variables and perform operations with complex numbers.
- Perform operations with various forms of complex numbers to solve equations.

DSC-8: Analog Electronics-II (Theory + Practicals) (Semester III)

The Learning Outcomes of this course are as follows:

- Understand basic building blocks of an op-amp and its parameters for various applications design.
- Elucidate and design the linear and non-linear applications of an op-amp.
- Understanding and Designing of various Signal Generators
- Understand the working of multivibrators using IC 555 timer
- Understand the non-ideal behavior by parameter measurement of Op-amp.
- Design application oriented circuits using Op-amp ICs.
- Generate square waves using different modes of 555 timer IC.
- Prepare the technical report on the experiments carried out

DSC-09: Signals and Systems (Theory + Practicals) (Semester-III)

The Learning Outcomes of this course are as follows:

- Understand mathematical description and representation of continuous and discrete time signals and systems.
- Develop input-output relationship for linear shift invariant systems and understand the convolution operator for continuous and discrete time systems.
- Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.

- Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.
- Generate/plot various signals, there transformation and compute convolution
- Generate/plot Fourier series of periodic signals.
- Compute Fourier transform.
- Learn the use of simulation tools and design skills.

DSC-10: Electrical Technology (Theory + Practicals) (Semester IV)

The Learning Outcomes of this course are as follows:

- Discuss the working principle of a Transformer and analyze its specifications
- Understand the working of DC Machines, DC Generators and DC Motors
- Classify Induction motors into Polyphase and single phase motors and understand their working
- Evaluate the working of Synchronous generators and synchronous motors and their comparative study with induction motors
- Understand the working of DC series, shunt and Induction motors
- Study the working of transformer
- Study of Stepper motor, Universal motor
- Write a technical report on the experiment performed.

DSC-11: Microprocessor (Theory + Practicals) (Semester IV)

The Learning Outcomes of this course are as follows:

- Understand the basic blocks of microcomputers i.e. CPU, Memory, I/O and architecture of microprocessors.
- Acquiring skills in writing assembly language program for 8085 microprocessor.
- Apply knowledge and demonstrate proficiency of designing hardware interfaces for memory, I/O and programmable peripheral interface devices with 8 bit microprocessor.
- Derive specifications of an 8 bit microprocessor based system as per required application.
- Proficient in use of IDE‘s for designing, testing and debugging microprocessor based systems.
- Interface various I/O devices and design and evaluate systems that will provide solutions to real-world problems.
- Prepare the technical report on the experiments carried.

DSC-12: Principles of Communication Systems (Theory + Practicals) (Semester IV)

The Learning Outcomes of this course are as follows:

- Be conversant with the requirements and the protocols employed in the fundamental components of a communication network.
- Understand the concept and basic circuits used in Continuous Wave analog modulation
- Understand the Principles of Sampling and Pulse Communication
- Insight on Digital Transmission.
- Understand basic elements of a communication system.
- Analyze the baseband signals in the time domain and in the frequency domain.
- Build understanding of various analog (CW) and Pulse modulation and demodulation techniques
- Prepare the technical report on the experiments carried

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE II : Internet of Things (Semester III)

Theory:

The Learning Outcomes of this course are as follows:

- Understand internet of Things, its hardware and software components and the IoT value chain structure (device, data cloud).
- Interface I/O devices, sensors & communication modules.
- Understand IoT sensors and technological challenges faced by IoT devices, with a focus on wireless, energy, power, and sensing modules
- Remotely monitor data and control devices and develop real life IoT based projects.

Practicals:

The Learning Outcomes of this course are as follows:

- Interfacing of various sensors using Arduino/Raspberry Pi
- Interfacing using Bluetooth, Web server, TCP, ThinkSpeak Cloud, MQTT broker

DSE II : Operating Systems (Semester IV)

Theory:

The Learning Outcomes of this course are as follows:

- Learn multiprogramming, multithreading concepts for a small operating system.
- Create, delete, and synchronize processes for a small operating system.

- Implement simple memory management techniques.
- Implement CPU and disk scheduling algorithms.
- Use services of modern operating system efficiently
- Learn basic file system.

Practicals:

The Learning Outcomes of this course are as follows:

- Implement various process scheduling algorithms
- Implement various priority based scheduling algorithms
- Implement various page replacement algorithms Implement various disk scheduling algorithms

Generic Elective(s) (Common Pool) (2nd Year)

GE-III / DSE-1: Artificial Intelligence and Machine Learning (Theory + Practicals) (Semester III)

The Learning Outcomes of this course are as follows:

- Build intelligent agents for search and games
- Solve AI problems through programming with Python
- Learning optimization and inference algorithms for model learning
- Design and develop programs for an agent to learn and act in a structured environment
- To study different supervised and unsupervised learning algorithms.
- To understand the application development process using ML
- Implement various search algorithms
- Implement Bayesian network
- Demonstrate classification and clustering
- Make a small project

GE-IV : Mobile Application Development (Semester IV)

The Learning Outcomes of this course are as follows:

- Explain the concepts on: Elements of user interface, Model-View-Controller architecture, Data persistence and storage, Multithreading, Mobile web vs. mobile app, Services, broadcasts and notifications, Sensor management and location-based services.
- Describe different mobile application models/architectures and patterns.
- Familiarize with data type, data operators, exception handling and file management

- Describe the components and structure of a mobile development framework (Flutter SDK) in the development of a mobile application

Skill Enhancement Course(s) (SEC) (Common Pool) (2nd Year)

N.A.

Value Addition Courses (VAC) (Common Pool) (2nd Year)

N.A.

Core Course(s) (3rd Year)

DSC-13: Embedded System (Theory + Practicals) (Semester V)

The Learning Outcomes of this course are as follows:

- Describe the fundamental concepts and features related to embedded systems.
- Understand the AVR RISC architecture and Instruction set.
- Interface I/O devices with microcontroller using parallel ports, serial ports, ADC etc.
- Learn the concepts of hardware & software interrupts and Timer
- Design simple embedded systems including their hardware as well as software.
- Students will be able to program AVR microcontrollers using AVR studio/similar IDE.
- Learn different interfacing techniques and standards to control various input output devices with the microcontroller.
- Students will be equipped with sufficient knowledge to implement mini projects.

DSC-14: Electromagnetics (Theory + Practicals) (Semester V)

The Learning Outcomes of this course are as follows:

- Getting familiar with vector algebra, coordinate system and coordinate conversion
- Understanding electrostatic fields and magnetostatic fields.
- A balanced presentation of static and time-varying fields. Physical interpretation of Maxwell‘s equation and problem solving in different media
- Understanding of propagation of an electromagnetic wave. Understand the plotting of vectors, and transformation among various coordinate systems in 2D and 3D.
- Understand the graphical representation of scalar and vector fields including gradient, divergence and curl.

- Understand the graphical representation of electric and magnetic fields for various types of charge and current distributions respectively.
- Understand the flow of energy and power associated with electromagnetic waves.

DSC-15: Basic VLSI Design (Theory + Practicals) (Semester V)

The Learning Outcomes of this course are as follows:

- Understand the concept of models of MOS devices and their implementation in designing of CMOS inverter
- Measure the performance parameters like threshold voltage, noise margins, time delays etc.
- Familiarize with the techniques and components involved in combinational MOS circuit designs.
- Describe the various types of semiconductor memories and issues involved in them.
- Reproduce the characteristics of digital circuits like inverter and other logic gates based on CMOS technology.
- Design the digital circuit components like latches, multiplexers etc.
- Perform experiments and the circuit design and collect and analyze the data
- Prepare the technical report on the experiments carried out

DSC-16: Digital Signal Processing (Theory + Practicals) (Semester VI)

The Learning Outcomes of this course are as follows:

- Grasp fundamentals of discrete time signals, linear time-invariant systems, Ztransform and Fourier transform
- Analyze linear time-invariant systems using Fourier and Z transform
- Understand the Design techniques of Digital FIR and IIR filters using direct methods and methods involving conversion of the analog filter into the digital filter by various transformations.
- Use DFT to perform frequency analysis of signals and application of FFT algorithms.
- Simulate, synthesize and process signals using a software tool.
- Apply transform methods for representing signals and systems in the time and frequency domain.
- Simulation and design of FIR and IIR Filters

DSC-17: Photonics (Theory + Practicals) (Semester VI)

The Learning Outcomes of this course are as follows:

- Describe the optics and simple optical systems.
- Understand the concept of light as a wave and its propagation in optical fibres, and relevance of this to optical effects such as interference , diffraction, polarization and hence to lasers, holography and optical waveguides.
- Use mathematical methods to predict optical effects with e.g. light-matter interaction, wave propagation in guided media, dispersion, wave optics
- Perform experiments based on the phenomenon of light/photons.
- Measure the parameters such as wavelength, resolving power, numerical aperture etc. using the appropriate photonic/optical technique.
- Prepare the technical report on the experiments carried out

DSC-18: Semiconductor Device Technology (Theory + Practicals) (Semester VI)

The Learning Outcomes of this course are as follows:

- Summarize the developments in the field of microelectronics technologies
- Describe the crystal growth, diffusion, oxidation, lithography, etching and various film deposition processes.
- Explain the process sequence for PN junction, BJT, CMOS and BiCMOS fabrication
- Operate the advanced computer simulations tools as well as visit research laboratories for better understanding of semiconductor fabrication processes.
- Perform the simulation of semiconductor crystal growth and device fabrication processes like oxidation and diffusion.
- Perform experiments to calculate the electronic parameters like resistivity, mobility, carrier concentration and band gap etc in semiconductors.
- Operate the deposition system for fabrication of thin films

Discipline Specific Elective Course(s) (DSE) (3rd Year)

DSE-III: Computer Networks (Theory + Practicals) (Semester V)

The Learning Outcomes of this course are as follows:

- Describing a computer network in terms of a layered model.
- Implementing data link, network, and transport layer protocols in a simulated networking environment
- Determine different types of errors and data flow within networks.
- Planning logical sub-address blocks with a given address block.

- Describing the standard protocols involved with the INTERNET, TCP/IP, based communications.

DSE IV : Transmission Lines, Antenna and Wave Propagation (Theory and Practicals) (Semester VI)

The Learning Outcomes of this course are as :

- Understand reflection and transmission of uniform plane wave.
- Explain the functioning of transmission line and its performance parameters.
- Understand wave propagation in waveguides and different modes of propagation.

In the Practicals students would learn to:

- Explain the radiation mechanism and characteristics of an antenna.
- Understand the phasor and its graphical representation for electromagnetic fields.
- Learn reflection and transmission of plane electromagnetic wave.
- Represent graphically various parameters of transmission line.
- Plot field configuration for different modes of the waveguide.
- Understand the radiation pattern and other characteristics of an antenna.

Generic Elective(s) (Common Pool) (3rd Year)

GE-V: Neural Networks (Theory + Practicals) (Semester V)

Theory:

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

- Realize the significance of Artificial Intelligence and basic Neural Networks
- Learn the neural network algorithms, modelling using optimizing solutions
- Apply the knowledge of Hyrid Systems
- Work with imprecise and uncertain solution data for solving problems

Practicals:

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

- Design and train neural networks for pattern recognition problems
- Design and train neural networks for classification and association problems
- Design fuzzy logic based systems for real time applications

GE-VI : Arduino/ Rpi App Development (Theory and Practicals) (Semester VI)

Theory :

The Learning Outcomes of this course are as:

- Understand the basic concepts of Arduino Uno / Raspberry Pi and the programming environments.
- Understand digital and analog ports of a microcontroller and their usage.
- Understand the working of various sensors and their application in robotics.
- Design different circuits and display their outputs using LCD and other Indicator

Practicals :

The Learning Outcomes of Practicals are to:

- Familiarize with the Arduino/Rpi microcontroller development boards.
- Understand interfacing of various display devices viz. 7-segment display, LED dot matrix, LCD.
- Understand various sensors, their applications and designing control experiments using

Skill Enhancement Course(s) (SEC) (Common Pool) (3rd Year)

Value Addition Courses (VAC) (Common Pool) (3rd Year)

8. COURSE: B.A. (HONS.) ENGLISH

DEPARTMENT: ENGLISH

Program Outcomes

PO1: The course develops critical and analytical abilities of learners thorough study of texts from a cross-section of periods, geographies and genres.

PO2: The course introduces students to literary traditions and contemporary literary approaches thereby opening them up to critical questions and social debates.

PO2: The course engenders appreciation of the language among students through aesthetic analysis of a variety of texts.

PO3: The course builds academic and analytical abilities as well as intellectual stamina by introducing them to various ways of analysing a text.

PO4: Through a study of classical texts, the programme connects literature to disciplines like history, sociology, geography and political science.

Program Specific Outcomes (PSO's)

PSO1: To offer students a foundational understanding of the domain of literature, its genres, methods of critique and its distinctive ability to influence and project social and cultural change.

PSO2: To offer students a basic understanding of the mode of thought and understanding in classical Europe and contextualize the western classical texts within literary studies in a scholarly manner.

PSO 3: To offer students a foundational understanding of Indian classical literary tradition and introduces students to a rich and diverse literature from two classical languages of India, Sanskrit and Tamil.

PSO4: To introduce the discipline of literary studies in English in a chronological manner, with specific reference to the social and cultural determinants of the period under review.

PSO5: To illustrate the ability of poetry to articulate the need for social and cultural reform.

PSO6: By studying this course, students will be able to develop a basic sense of the way in which drama works as genre on its own terms.

PSO7: Students' imagination will be stimulated by showing how theatre can analyse and critique political and cultural hierarchies successfully.

PSO8: To offer a continuing sense of the evolution of literary studies in English, so that the quiet revolutions of the eighteenth century in England resonate with significance in contemporary times.

PSO9: To study the period under survey through a combination of genres to focus on movements of empire, capital and emancipation.

Course Outcomes: B.A. (Hons.) English (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC 1: Introduction to Literary Studies (Semester-I)

- CO1: By the end of this course, it is hoped that a basic sense of literature as a discipline of thought and application will be inculcated among students.

DSC 2: European Classical Literature (Semester-I)

- CO1: By the end of this course, students will gain an understanding of the classical, that is valuable in itself and as a frame of reference for subsequent periods of literary studies.

DSC 3: Indian Classical Literature (Semester-I)

- CO1: Students will be able to gain knowledge of the aesthetic and cultural values that serve as the groundwork for later developments in Indian philosophical and social change.

DSC 4: 14th to 17th Century English Poetry (Semester-II)

- CO1: By studying this course, students will be able to develop a basic sense of the tools and methods employed by the poetry of the period to analyse and change social and political hierarchies.
- CO2: Students will inculcate a foundational understanding of the distinctive ways in which poetry works.

DSC 5: 16th & 17th Century English Drama (Semester-II)

- CO1: By studying this course, students will be able to develop a basic sense of the way in which drama works as genre on its own terms.
- CO2: Students' imagination will be stimulated by showing how theatre can analyse and critique political and cultural hierarchies successfully.

DSC 6: 18th Century Literature (Semester-II)

- CO1: By studying this course, students will be able to understand the way in which the 'Age of Reason' shapes contemporary life.
- CO2: Students will be alerted to understanding the ways in which major lines of thought and action may have understated beginnings.

Generic Elective (GE) (Common Pool) (1st Year)

GE1: Indian English Literatures (Semester-I)

- CO1: To introduce literary texts from a range of regional, cultural, social, and political locations within India
- CO2: To inculcate an in-depth understanding of some of the major issues shaping this literary production
- CO3: This course will help students to comprehend regional differences in the issues discussed and in socio-cultural contexts.
- CO4: Students will be enabled to analyze the use of the English language by non-native speakers and writers.

GE2: Individual and Society (Semester-II)

- CO1: To outline the ways in which individual and society engage with each other across socio political and geopolitical contexts.
- CO2: To identify the texts and discuss the contexts that enable such an engagement and continue to shape the world.
- CO3: By studying this course, students will be able to demonstrate an ability to evaluate the continuing significance of identity-construction and aesthetic representation.
- CO4: Students will be able to assess and justify the ways in which different modes of narratives reconfigure the relationships between individual and society.

Skill Enhancement Course (SEC) (Common Pool) (1st Year)

SEC: LIFE SKILL EDUCATION (Semester-I)

- CO1: Focus on development of values in strengthening knowledge and life skills, bringing high quality standards in field work practice-learning.
- CO2: Understand the strength-based life skill development, team work, innovate leadership, design thinking and career building skills
- CO3: Develop universal human values while utilizing life skills in field work.

Value Addition Courses (VAC) (Common Pool) (1st Year)

Core Course(s) (2nd Year)

DSC - 7 : Romantic Literature (Semester III)

The Learning Outcomes of this course are as follows:

- The students will have a foundational understanding of the way in which Romantic thought and literature continue to sensitise us in terms of cultural and social change.
- The students will have a sense of how dominant movements in the field of political and social representation, education and imagination emerge powerfully at this time.
- By studying this course, students 'imagination will be stimulated by an understanding of the ways in which Romantic theory and praxis influence many movements of change in the contemporary world.
- This course will map an exciting phase in the development of thought, gender-mobility and social change

DSC - 8: Victorian Literature (Semester III)

The Learning Outcomes of this course are as follows:

- Students will have a fundamental understanding of how nineteenth-century developments in England around industrialization, colonization and gender-relations foreshadow later thinking on the subject.
- Students will have a basic sense of the deep-rooted nature of contemporary social and cultural challenges as having their origins in earlier times.

DSC - 9 : Literary Criticism (Semester III)

The Learning Outcomes of this course are as follows:

- Students will have a foundational understanding of the tenets of literary appreciation with specific reference to aesthetic evolution, genre and cultural production.
- The students will have a cross-disciplinary sense of the field with specific reference to philosophy, aesthetics and historicism.
- By studying this course, students will be communicated a basic sense of the evolution of literary criticism.
- Students will be encouraged towards comprehending how literary criticism enriches our understanding of how philosophical and material contexts shape literature.

DSC-10: American Literature (Semester IV)

The Learning Outcomes of this course are as follows:

- It offers students a foundational understanding of the literature of the United States with specific reference to the way it chronicles patterns of oppression and freedom in the lives of its peoples.
- It opens up a range of possibilities in the way in which literature shapes and chronicles new frontiers and cultural groups.
- By studying this course, students will be able to trace the powerful role played by literature in shaping the emergent United States.
- Students will be enlightened on how literature chronicles and shapes both different kinds of enslavement and possibilities of liberation.

DSC - 11: Indian Writing in English (Semester IV)

The Learning Outcomes of this course are as follows:

- To offer students a foundational understanding of the distinctively Indian qualities of literature in English, across a range of genres.
- To open up a sense of the Indian response to literary and political challenges in modern times.
- By studying this course, students will be able to gain a basic sense of Indian writing in English as a viable means to understand the evolution of modern India.
- Students 'imagination will be stimulated by an understanding of how Indian writing in English opens up the challenges and complexities of contemporary India.

DSC - 12 : Indian Writing in English Translation (Semester IV)

The Learning Outcomes of this course are as follows:

- To help students understand and celebrate the diversity of linguistic and regional influences on the shaping of modern India.
- It opens up a sense of the sophistication and fluidity of Indian thought and literature even when it speaks through the medium of translation.
- By studying this course, students will gain knowledge of the richness of modern Indian writing.
- Students will be encouraged to understand how contemporary India owes its diversity to a range of literatures, cultures and regions.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE - 1: Literature and Cinema (Semester III)

The Learning Outcomes of this course are as follows:

- To help familiarise students with the basic aspects of cinema studies.
- To consider the relationship between literature and cinema.
- By studying this course, students will be able to acquire knowledge of visual grammar across genres of film.
- Students will understand how cinema deals with issues of gender and sexuality.

DSE-2: Graphic Narratives (Semester IV)

Learning Objectives

The Learning Outcomes of this course are as follows:

- To introduce students to the field of graphic narratives.
- To sample a variety of graphic narratives from different locations and in varied styles.
- By studying this course, students will be provided an understanding of the specific languages of graphic narratives.
- Students will be able to comprehend the relationship between text and visuality.

Generic Elective (GE) (Common Pool) (2nd Year)

GE - 5: Readings on Indian Diversities and Literary Movements (Semester III)

The Learning Outcomes of this course are as follows:

- To introduce the social and cultural history of India which were conducive to the development of art and literature
- To inculcate new ways to interpret, understand and read representations of diversity.
- By studying this course, students will be able to read non-verbal social and cultural history
- Students will be encouraged to be open to the diverse modes of thought.

GE-12 : Travel Writings (Semester V)

The Learning Outcomes of this course are as follows:

- It introduces students to the field of genre fiction
- It indicates the diversity of the field

- By studying this course, students will be able to analyse the differences and similarities between detective and science fiction.
- Students will be able to appreciate generic specifics of travel writings

GE Language Course(s)

GEL-2: English Language Through Literature-II

The Learning Outcomes of this course are as follows:

- By studying this course, students will be able to inculcate confident expression.
- Students will be able to articulate their own views confidently as their language skills sufficiently empower them to converse, research and collate information from various textual sources—verbal or written.

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC - 3: Public Speaking in English Language and Leadership (Semester III)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to learn effective communication through Public Speaking will instill leadership development among students.
- After studying this course, students will be able to lead in different fields at the undergraduate level, be responsible citizens and employ leadership skills in their future endeavours, too.
- After studying this course, students will be able to strengthen their critical mindset, help them being assertive and put forward constructive viewpoints employing the skills learnt in the practice sessions.

SEC - 4: Communication in Professional Life (Semester IV)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to improve presentation skills to be learnt by effective use of verbal and non-verbal communication for the professional field.
- After studying this course, students will be able to acquire practical employability skills to be disseminated through focused sessions on practical employable knowledge.
- After studying this course, students will be able to enhance professional communication.

- After studying this course, students will be able to improve persuasion and negotiation skills which will be useful for the professional field.

Value Addition Courses (VAC) (Common Pool) (2nd Year)

VAC - 3: Emotional Intelligence (Semester III)

The Learning Outcomes of this course are:

- Self-Awareness, Self-Management, Social Awareness & Relationship Management.
- Discover personal competence and techniques of building emotional intelligence.
- Gain insights into establishing positive relationships.

VAC-4 : Ecology and Literature (Semester IV)

The Learning Outcomes of this course are as follows:

- The course will highlight the urgency of environmental crisis, making Students conscious and aware of the role each one of us plays.
- Students will be trained into environmental sensitivity and responsible Ecological behaviour.
- Students will be encouraged to respond to incidents of habitat destruction deforestation, etc. and realise the need for our urgent intervention.

IIIrd Year

Core Course(s) (3rd Year)

DSC 13: Twentieth Century Poetry and Drama (Semester V)

The Learning Outcomes of this course are as follows:

- It offers the students an understanding of the distinctive characteristics of the twentieth century as a space of thought, with specific reference to its poetry and drama as significant tools of cultural analysis.
- It opens up the way in which the poetry and drama of the period reconstitute readership/ spectatorship as agents of cultural change.
- By studying this course, students will be able to inculcate a basic sense of the anxieties and influences of the age immediately preceding our own.
- Students will gain knowledge on how literature as a discipline continues to critique and alter its times.

DSC 14: Twentieth Century Novel (Semester V)

The Learning Outcomes of this course are as follows:

- To offer students an understanding of the distinctive characteristics of the way in which the novel as an art form defines and alters the twentieth century.
- To open up the way in which the twentieth century novel is the most telling site of social critique and change.
- By studying this course, students will be able to inculcate a basic sense of the instruments that the twentieth century novel uses to alter the period of its origin.
- Students will gain an understanding of how the novel as an art form can pick up the philosophical and political lines of inquiry of the period under survey.

DSC 15: Dalit Writings (Semester V)

The Learning Outcomes of this course are as follows:

- It gives students a foundational understanding of the way in which Dalit literature both chronicles a continuing history of oppression and functions as an invaluable instrument of cultural assertion.
- It opens up a sense of the way in which intersectional marginalities find their voices in Dalit literature and seek social and human justice.
- By studying this course, students will be able to grasp the importance of Dalit literature as historical witness and as cultural catalyst.
- Students 'imagination will be stimulated through an understanding of how the aesthetic of suffering may be used to bring about social and cultural redressal.

DSC 16: Modern European Drama (Semester VI)

The Learning Outcomes of this course are as follows:

- To analyse the way in which nineteenth and twentieth-century theatre in Europe thinks through political and cultural hierarchies of power, enslavement and liberation.
- To open up a sense of the way in which European drama articulates questions of continuing relevance in the contemporary world such as the individual and the state, the position of women, and issues of dominance.
- By studying this course, students will be able to inculcate a basic sense of the way theatre serves as a means of social and cultural investigation and change.
- Students will learn how drama as a genre alters our sense of both the individual and society.

DSC 17: Literature and Disability (Semester VI)

The Learning Outcomes of this course are as follows:

- To challenge and reconstitute our sense of what constitutes 'the normal 'as a category of thought and action.
- To build a critically compassionate consciousness on the subjects of individual and social identity-construction under conditions of disability.
- By studying this course, students will be able to inculcate a basic sense of the theory and field of Disability Studies with specific reference to its articulation through literature.
- This course will encourage students to think of a revolutionised debate on the subject of self/ social-alienation and self/social-restoration under the challenge of disability.

DSC18: Women Writings (Semester VI)

The Learning Outcomes of this course are as follows:

- It offers students a foundational understanding of the ways in which critical categories such as ethnicity, caste and class find their articulate in writings by women.
- It opens up a sense of the Indian presence in the ongoing debate on the rights and position of women in contemporary society.
- By studying this course, students will be able to inculcate a basic sense of how writings by women serve as a primary instrument to document and demand social change.
- This course will open up a space for a discussion on how this is a core area that demands attention and change in contemporary India.

Discipline Specific Elective Course(s) (DSE) (3rd Year)

DSE 8 - Indian Partition Literature (Semester V)

The Learning Outcomes of this course are as follows:

- It introduces the subject of Partition Literature in India.
- It sensitizes students to complex narratives of Partition.
- Students will acquire in-depth knowledge of literary and theoretical insights into Partition.
- Students will acquire in-depth knowledge of literary and theoretical insights into Partition.

DSE 11: Speculative Fiction and Detective Fiction. (Semester VI)

The Learning Outcomes of this course are as follows:

- It introduces students to types of detective and speculative fiction.
- It looks at generic characteristics of the literature.
- By studying this course, students will be able to analyse world writings as reflections on contemporary realities.
- Students will be able to appreciate the vitality and diversity of detective and speculative fictions.

Generic Elective (GE) (Common Pool) (3rd Year)

GE-2 Genre Fiction (Semester V)

The Learning Outcomes of this course are as follows:

- To understand how the evolving genre of fiction engages with contemporary social and cultural realities.
- To understand the strategies of narrative and themes this specific genre of fiction uses.
- By studying this course, students will be able to efficiently undertake textual analysis within the specific rubric of genre fiction.
- Students will gain knowledge of the aspects of fictionality while engaging with popular culture.

GE - 16 : Individual and Society (Semester VI)

The Learning Outcomes of this course are as follows:

- Students learn the ways in which individual and society engage with each other across socio political and geopolitical contexts
- Students analyze the texts and contexts that that enable such an engagement and continue to shape the world
- By studying this course, students will be able to inculcate an ability to evaluate the continuing significance of identity-construction and aesthetic representation.
- Students will be able to appreciate the way in which different modes of narratives reconfigure the relationships between individual and society.

Skill Enhancement Course (SEC) (Common Pool) (3rd Year)

SEC 5: Creative Writing (Semester V)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to develop sense of expressing themselves through poetry/short story/biography.
- After studying this course, students will be able to induce an understanding of the relationship between an individual and society.
- After studying this course, students will be able to get into different fields and pursue versatile career opportunities.
- After studying this course, students will be able to develop an understanding of theatre and performance through drama will also help them to develop observatory and behavioural skills.
- After studying this course, students will be able to develop a critical thought process and a knack in putting it in words. Students may also utilise the learnings of proofreading and editing for their academic and professional growth.
- After studying this course, students will be able to go for publishing their own work.
- After studying this course, students will be able to write a book and submit to professional bodies & academic organisations.

SEC-6 : Business Communication (Semester VI)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to explain the need for communication in management.
- After studying this course, students will be able to appreciate the need of effective writing for communication.
- After studying this course, students will be able to demonstrate the skill of effective report writing and summarizing annual reports.
- After studying this course, students will be able to analyse business correspondence and e- correspondence.
- After studying this course, students will be able to appreciate oral presentations.

Value Addition Courses (VAC) (Common Pool) (3rd Year)

N.A.

9. COURSE: B.A. (HONS.) HINDI

DEPARTMENT: HINDI

Program Outcomes

भारतीय संविधान में देवनागरी लिपि में लिखित हिंदी को संघ की राजभाषा घोषित किया गया है । हिंदी पढ़ने वाले छात्र को भाषा की क्षमता से परिचित होना जितना आवश्यक है उतना ही उसे समाज की चुनौतियों के संदर्भ में जोड़ने की योग्यता विकसित करना भी जरूरी है । आज हम भूमंडलीकृत समाज के सदस्य हैं अतः पाठ्यक्रम का उद्देश्य विद्यार्थी को देश-विदेश के साहित्य में हो रहे बदलाव से परिचित कराना भी है और व्यावसायिक योग्यता उत्पन्न करना भी! यह पाठ्यक्रम बाजारवाद और भूमंडलीकरण की वैश्विक गति के बीच से ही हिंदी की राष्ट्रीय प्रगति को भी सुनिश्चित करेगा क्योंकि सशक्त भाषा के बिना किसी राष्ट्र की उन्नति संभव नहीं है ।यह पाठ्यक्रम वर्तमान संदर्भों के अनुकूल है साथ ही इस पाठ्यक्रम का आधुनिक रूप रोजगार परक भी है ।यह पाठ्यक्रम विद्यार्थियों को व्यावहारिक पहलू से अवगत करा सकेगा । हिंदी साहित्य की नई समाज और भाषा की व्यवहारिकता की जानकारी इसका प्रमुख है ।इस पाठ्यक्रम का उद्देश्य भाषा और समाज के जटिल संबंधों की पहचान करना भी है जिससे विद्यार्थी देश ,समाज, राष्ट्र और विश्व के साथ बदलते समय में व्यापक सरोकारों से अपना संबंध जोड़ सकें साथ ही उसके भाषा कौशल , लेखन और संप्रेषण क्षमता का भी विकास हो सके ।

Programme learning outcomes

इस पाठ्यक्रम को पढ़ने-पढ़ाने के क्रम में निम्नलिखित परिणाम सामने आएंगे : -

- इस पाठ्यक्रम के माध्यम से सीखने सिखाने की प्रक्रिया में हिंदी भाषा के आरंभिक स्तर से अब तक के बदलते रूपों की विस्तृत जानकारी प्राप्त की जा सकेगी ।
- भाषा के सैद्धांतिक रूप के साथ-साथ व्यावहारिक पक्ष को भी जाना जा सकेगा ।
- उच्च शैक्षिक स्तर पर हिंदी भाषा किस प्रकार महत्वपूर्ण भूमिका निभा सकती है इससे संबंधित परिणाम को प्राप्त किया जा सकेगा।
- छात्र अपनी भाषा को सीखने की प्रक्रिया में भाषागत मूल्यों को व्यावहारिक रूप से भी जान सकेंगे ।

- व्यावसायिक क्षमता को बढ़ावा देने के लिए भाषा , अनुवाद , कंप्यूटर जैसे विषयों को हिंदी से जोड़कर पढ़ाना जिससे बाजार के लिए आवश्यक योग्यता का भी विकास किया जा सके।
- हिंदी के अतिरिक्त भारतीय साहित्य का ज्ञान भी अपेक्षित रहेगा जो छात्रों के व्यक्तित्व विकास में सहायक होगा तथा अभिव्यक्ति क्षमता का भी विकास किया जा सके ।
- साहित्य के सौंदर्य , कला बोध के साथ वैचारिक मूल्यों को बढ़ावा देना ।
- साहित्यिक विधाओं के माध्यम से विद्यार्थी की रचनात्मकता को दिशा देना I कविता , कहानी और नाटक जैसी विधाओं द्वारा विद्यार्थी की रचनात्मकता को प्रोत्साहित करना।
- साहित्य के आदिकालीन संदर्भों से लेकर समकालीन रूप से परिचित कराना जिससे विद्यार्थी साहित्यकार और युगबोध के संबंध को परख और पहचान सके ।
- साहित्य विवेक का निर्माण , मानव मूल्यों की स्थापना तथा सांस्कृतिक पहचान को सशक्त करना ।

Course Outcomes: B.A. (Hons.) Hindi (NEP UGCF 2022)

Core Course(s) (1st Year)

B A (HONS) HINDI बी ए (हिंदी) प्रथम वर्ष

पेपर नाम - हिंदी कविता (आदिकाल एवं निर्गुण भक्ति काव्य) – DSC-1(कोर कोर्स1)

Course objective

- हिंदी साहित्य के आदिकालीन एवं भक्तिकालीन साहित्य से परिचय करवाना ।
- आदिकाल के दो प्रमुख कवियों - चंदरबरदाई और विद्यापति की विशिष्ट भूमिका रही है । विद्यार्थी इन साहित्यकारों से परिचित होंगे
- निर्गुण भक्ति काव्य के अन्तर्गत - संतकाव्य एवं प्रेमाख्यानक काव्य के प्रमुख कवियों कबीर , जायसी आदि का अध्ययन करना और हिंदी साहित्य के अन्तर्गत उनके योगदान पर विचार करना।

Course learning outcomes

- आदिकाल के परिवेश - राजनीतिक , सामाजिक , सांस्कृतिक ,धार्मिक परिस्थितियों से अच्छी प्रकार परिचित हो सकेंगे ।
- आदिकाल में चंदरबरदाई के साहित्यिक और संगीत के क्षेत्र में योगदान से परिचित हो सकेंगे
- भक्तिकाल हिंदी साहित्य का स्वर्ण युग है । इसके अध्ययन से मानवीय और नैतिक मूल्यों का' विकास होगा ।
- भक्तिकाल के साहित्य में सामंत व्यवस्था का विरोध हुआ , यह इस काव्य की विशिष्ट उपलब्धि है।

हिंदी साहित्य का इतिहास(आदिकाल एवं मध्यकाल)

Core course – (DSC) 2

Course objective

- हिंदी भाषा में लिखे गए साहित्य के इतिहास का बोध
- प्रमुख रूप से उपलब्ध एवं लिखित इतिहास ग्रंथों की जानकारी
- हिंदी भाषा के साहित्य के आदिकाल, मध्यकाल के कालखंड के इतिहास का ज्ञान

Course Learning outcomes

- **हिंदी साहित्य के इतिहास का** ज्ञान
- इतिहास ग्रंथों का विश्लेषण
- इतिहास ग्रंथों के निर्माण की पद्धति का ज्ञान

पेपर का नाम - हिंदी कहानी

Core course –(D S C -3)

Course objective

- हिंदी भाषा की कहानी के उद्भव - विकास की जानकारी
- कहानी विश्लेषण की समझ
- कथा साहित्य में कहानी की दशा एवं अवस्था का विवेचन
- प्रमुख कहानीकार और उनके द्वारा लिखी कहानियाँ .

Course Learning outcomes

- हिंदी भाषा के कथा साहित्य से परिचय
- कहानी लेखन और उसके प्रभाव का विश्लेषण
- प्रमुख कहानीकार और उनकी कहानी के द्वारा कहानी की उपादेयता और विश्लेषण की समझ

SEMESTER—2

CORE COURSE (DSC4)

पेपर--- हिंदी कविता : सगुण भक्तिकाव्य एवं रीतिकालीन काव्य

COURSE OBJECTIVE

- सगुण भक्तिकाव्य एवं रीतिकालीन काव्य का अध्ययन समय अवधि की साहित्यिक स्थिति से अवगत कराएगा ।
- सामाजिक राजनीतिक सांस्कृतिक पृष्ठभूमि में कविता के अध्ययन विश्लेषण की जानकारी देना।

COURSE LEARNING OUTCOMES

- हिंदी के मध्यकालीन साहित्य का विशिष्ट परिचय प्राप्त होगा ।
- ब्रजभाषा के समृद्ध साहित्य का रसास्वादन और आलोचनात्मक ज्ञान प्राप्त होगा।

पेपर –हिंदी साहित्य का इतिहास

(आधुनिक काल)

CORE COURSE (DSC 5)

Course objective

- साहित्येतिहास इतिहास की अध्ययन प्रक्रिया में आधुनिक साहित्य के विकास का परिचय।
- साहित्य के स्वरूप और प्रयोजन का ज्ञान ।
- साहित्य और समाज के आपसी रिश्ते और कालजयी कृतियों का परिचय ।

COURSE LEARNING OUTCOMES

- विकास के क्रम में साहित्य के माध्यम से समाज और संस्कृति की पहचान हेतु साहित्येतिहास के अध्ययन का महत्व निर्विवाद है ।

- साहित्य - इतिहास के अध्ययन का एक प्रयोजन साहित्य के विकास की गति और दिशा के साथ-साथ समाज के विकास को भी चिह्नित करना है ।
- साहित्य - इतिहास के बिना साहित्य - विवेक का उचित विकास और निर्माण संभव नहीं ।अतः साहित्य के विवेक के निर्माण के लिए साहित्येतिहास का अध्ययन आवश्यक है]

पेपर -हिंदी निबंध एवं अन्य गद्य विधाएँ

CORE COURSE (DSC 6)

Course objective

- अन्य- गद्य विधाओं की जानकारी ।
- गद्य -विधाओं की विश्लेषण पद्धति ।
- प्रमुख गद्य -विधाओं की चुनी हुई रचनाओं का अवलोकन।

Course learning outcomes

- कथेतर साहित्य का परिचय ।
- विश्लेषण और रचना प्रक्रिया की समझ ।
- प्रमुख रचनाकारों का परिचय ।

B A (HONS) HINDI 2ND YR

SEMESTER 3RD Core Course

(DSC-7)

पेपर - भारतीय साहित्य

पाठ्यक्रम का उद्देश्य(Course objective)

- भारतीय साहित्य की अवधारणा से परिचित कराना
- भारत की भौगोलिक , भाषिक और सांस्कृतिक विविधता का परिचय देना
- भारतीय सांस्कृतिक - बोध के विकास का परिचय देना।

पाठ्यक्रम अध्ययन के परिणाम(course learning outcomes)

- भारतीय साहित्य के अध्ययन से सांस्कृतिक समझ विकसित होगी।
- भारतीय सांस्कृतिक विविधता में निहित एकता की समझ विकसित होगी ।

- भारतीय साहित्यिक परंपरा के विकास की समझ विकसित होगी ।

पेपर - हिंदी नाटक एवं एकांकी

CORE COURSE (DSC-8)

पाठ्यक्रम का उद्देश्य(Course objectives)

- नाटक के उद्भव और विकास का परिचय देना।
- नाटक के सांस्कृतिक और सामाजिक पक्ष का परिचय देना ।
- नाटक के सर्वांगीण समझ विकसित करना ।

पाठ्यक्रम अध्ययन के परिणाम (course learning outcomes)

- नाट्य परंपरा का परिचय प्राप्त होगा।
- नाटक के सांस्कृतिक पक्ष और शैली के परिचय से विश्लेषण क्षमता विकसित होगी।
- 'हिंदी के प्रमुख नाटकों के अध्ययन से हिंदी नाटक की विकास यात्रा का परिचय प्राप्त होगा।

पेपर - सामान्य भाषा विज्ञान

Core Course-(DSC 9)

पाठ्यक्रम का उद्देश्य(course objectives)

- भाषा तथा भाषा विज्ञान की अवधारणा से परिचित कराना।
- भाषा की विशेषताओं और उपांगों का विश्लेषणात्मक ज्ञान प्रदान करना ।

पाठ्यक्रम अध्ययन के परिणाम परिणाम(course learning outcomes)

- भाषा विज्ञान के सिद्धांत एवं तकनीकी पक्षों की समझ विकसित हो सकेगी ।
- भाषा और उसके विभिन्न अंगों का परिचय प्राप्त होगा ।

Generic Elective (GE) (Common Pool)

पेपर का नाम - हिंदी में व्यावहारिक अनुवाद

Core Course – (GE) 4 credits

Course objective

- अनुवाद की समझ उत्पन्न करना

- व्यावहारिक और क्षेत्र विशेष में अनुवाद गतिविधियों का परिचय देना

Course learning outcomes

- अनुवाद की रोजगारपरक क्षमता विकसित होगी
- क्षेत्र विशेष की मांग से परिचित होंगे

Generic Elective - G E / Language

पेपर नाम - *हिंदी सिनेमा और उसका अध्ययन*

Core course – 4 credits

Course objective

- ' हिंदी सिनेमा संसार की जानकारी
- *सिनेमा के निर्माण , प्रसारण और उपभोग से संबंधित आलोचना तक चिंतन की समझ*

Course Learning Outcomes

- हिंदी सिनेमा , समाज और संस्कृति की समझ
- सिनेमा निर्माण , प्रसार कैमरे की भूमिका आदि की व्यावहारिक समझ ।

Skill Enhancement Course (SEC) (Common Pool)

Value Addition Course (VAC) (Common Pool)

10. COURSE: B.A. (HONS.) HISTORY

DEPARTMENT: HISTORY

Program Outcomes

The History Honours curriculum is based on the following programme outcomes:

PO1: The objective of this curriculum is to prepare the students for the society at large.

PO2: This curriculum of B.A History Honours offers students access to cutting edge scholarship organised in a pedagogical form that is accessible and interesting.

PO3: It provides the students with an opportunity to critically analyse the historical processes which have an interminable influence on our society at large.

PO4: It gives requisite information about different aspects of the past to students, to teach them how to deconstruct this information, how to undertake research, frame an argument and debate, a process that has immense significance. The expected outcome is to make students understand the interconnectedness of our present with the past. It provides a mechanism through which students, by acquiring knowledge about the past, also learn the skills to understand the present better.

PO5: On completion of the course students are expected to have acquired the skills of critical thinking, rational enquiry, effective communication, and exploring the relationship between past, present and historiography.

PO6: To acquire knowledge of multiple perspectives through which significant developments in the history of the Indian subcontinent from earliest times up to the period after independence.

PO7: To familiarize them with the significant patterns of development in certain parts of the modern and early modern world as well as certain non-Indian ancient societies.

PO8: To enable them to carefully read a complex historical narrative, evaluate its deployment of evidence, and understand its argument as well as critically analyse the same.

PO9: To be able to identify patterns of change and continuity with regards to issues of contemporary significance over long durations as well as across diverse geo-cultural zones.

PO10: Greater ability to distinguish between a historical phenomenon -- that is time-place-context driven, hence changeable and challengeable -- from that which is not.

PO11: Sensitivity to gender and social inequities as well as acquaintance with the historical trajectories of these issues.

PO12: Greater respect for basic human values and ideals of equality, freedom, respect for diversity, and other constitutional values.

PO13: Skill of picking up disparate sets of information from varied sources and weaving them into a coherent argument with a view to reveal identifiable patterns of development.

PO14: Capability to assume leadership roles and apply the above mentioned analytical ability in various other non-familiar contexts.

PO15: Possess knowledge of the values and beliefs of multiple cultures so as to effectively engage in a multi-cultural society and interact with diverse groups.

Course Outcomes: B.A. (Hons.) History (NEP UGCF 2022)

Core Course(s) (1st Year)

BHH 1.1: History of India I (From the beginning to fourth century BCE) (DSC 01) (Semester-I)

- CO1: To form a foundational basis for understanding early Indian History and to compare the various historiographical trends.
- CO2: To describe, explain and examine the importance of various sources in writing early Indian History.
- CO3: To identify and distinguish between different Prehistoric hunter-gatherers and early food producing societies.
- CO4: To categorise various settlement patterns and explain different aspects of Harappan civilisation (town planning, religion, craft production, trade etc;)
- CO5: To compare and contrast debates on the Aryan question, emergence of various other cultures (PGW, NBPW, Megalithic)
- CO6: To identify Literary and textual traditions and analyse the socio-political institutions and the process of state formation.

BHH 2.1: Social Formations and Cultural Patterns of the Ancient World-1(DSC-2) (Semester-I)

- CO1: The Course aims to introduce students to significant developments in world history that have shaped the complexity of human existence.
- CO2: To offer a historical survey of human evolution.
- CO3: To study the impact of specific ecological conditions on different trajectories of growth, higher population density and social complexity, the emergence of the city and newer crafts.
- CO4: To trace long term changes in the relationship of humans to their landscapes, to resources and to social groups
- CO5: Discuss that human history is the consequence of choices made I=in ecological and biological contexts, and that these choices are not only forced by external forces but are also enabled by changes in technology and systems of cultural cognition.

- CO6: Delineate the significance of early food production and beginning of social complexity.
- CO7: Analyse the process of state formation and urbanism in the early bronze age civilizations.
- CO8: Correlate the ancient past and its connected histories, the ways in which it is reconstructed, and begin to understand the fundamentals of historical methods and approaches.

BHH 3.1: History of the USA: Independence to Civil War (DSC-03) (Semester-I)

- CO1: To explain the emergence of new independent nation in the western hemisphere(USA) At the cost of placing Indigenous tribes behind reserves and introduction of the institution of slavery and racism.
- CO2: To examine the limits of American democracy in its formative stages along with the foundation of the U.S foreign policy.
- CO3: To describe the economics of slavery in the USA along with details of slave culture and forms of resistance.
- CO4: To trace the main issues related to the Civil War and its critical evaluation.

BHH 1.2: History of India-II: c. 300CE-750 CE (DSC 04) (Semester-II)

- CO1: To discuss the ways in which historians have questioned the characterisation of the Mauryan state.
- CO2: To delineate changes in agriculture, technology, craft-production, urban development, trade and use of currency.
- CO3: To analyse critically the changes in the varna caste system and the changing nature of gender relations and property rights.
- CO4: To write and undertake projects related to religious developments, art, architecture and forms of patronage.
- CO5: Appreciate the various sources that help in the reconstruction of our past.
- CO6: Highlight major changes that led to the transition from early historical to the early medieval phase in Indian history (Mauryan to Post-Mauryan period, Tamilakkam

BHH 2.2: Social Formations and Cultural Patterns of the Medieval World-II (DSC: 05) (Semester-II)

- CO1: To identify the main historical developments in Ancient Greece and Rom
- CO2: To gain an understanding of the restructuring of state and society from tribe-based politics to those based on territorial identity and citizenship.

- CO3: To trace the emergence and institutionalization of social hierarchies and marginalisation of dissent.
- CO4: To explain the trends in the medieval economy.
- CO5: To analyse the rise of Islam and the move towards state formation in West Asia.
- CO6: To understand the role of religion and other cultural practices in community organisation.

BHH 3.2: History of the USA: Reconstruction to New Age Politics (DSC-6) (SEM-2) (Semester-II)

- CO1: To explain the reasons for the implementation of Radical Reconstruction and the causes for its limited success.
- CO2: To analyse the growth of capitalism in the USA.
- CO3: To discuss the history of Populist and Progressive Movements.
- CO4: To describe the nature of the Women's liberation Movement and its changing contours from the nineteenth to the twentieth centuries.
- CO5: To trace the significance of the African -American Movement and how it eventually assisted in the emergence of Civil Rights Movement and Martin Luther King Jr.

Generic Elective Course(s) (GE) (Common Pool) (1st Year)

GE 1: Delhi Through the Ages: The Making of its Early Modern History (Semester-I)

- CO1: To acquaint students with the history of Delhi till the early modern period.
- CO2: To analyse the processes of urbanisation as shaped by political, economic and social changes.

GE 2 -Delhi Through the Ages: From Colonial to Contemporary Times (Semester-II)

- **CO1:** To analyse the political developments and their legacy for the shaping of the city.
- **CO2:** To discern the importance of local social, ecological and cultural processes that shape and reshape the city.
- **CO3:** To explain the historical roots of the problems of sustainable urbanisation with regard to Delhi.

Skill Enhancement Course(s) (SEC) (Common Pool) (1st Year)

SEC 1.1: Political Leadership and Communication (Semester-I)

- CO1: To identify the multidisciplinary aspect of Political Leadership and Communication.
- CO2: To explain the meaning of Political Communication and Leadership. Also identify various forms of the same.
- CO3: Developing Communication and Leadership based on research and case studies.
- CO4: Assess various research methodologies in Political communication and leadership and identify issues and challenges.
- CO5: Analysing a political campaign or a leader and to recommend a suitable model based on research.
- CO6: Examining Psephology and exploring various career options.

SEC 1.2: Prospecting e-waste for Sustainability (Semester II)

- CO1: Holistically analyse the environmental as well as health impacts of E-Waste
- CO2: Understand the effective mechanisms to regulate the generation, collection, and storage of E-Waste
- CO3: Develop an understanding of recycling, treatment and disposal of E-Waste and related legislative rules.
- CO4: Apply the skills and various concepts for sustainable management of E-Waste.
- CO5: Decipher the role of various national and international regulations for E-Waste Management.
- CO6: Provide specific recommendations for improved methods of handling E-Waste at different stages such as generation, collection, storage, transport and recycling.

Value Addition Course(s) (VAC) (Common Pool) (1st Year)

VAC 1.1: Constitutional Values and Fundamental Duties (Semester-I)

- CO1: To understand the Constitution and its relevance.
- CO2: To appreciate the values and goals embedded in the Constitution.
- CO3: To recognise the importance of Fundamental Duties enshrined in the Constitution.
- CO4: To apply the spirit of fundamental values and duties in everyday national life.

VAC 1.2: FIT INDIA (Semester-II)

- CO1: Encourage students to adopt a healthy lifestyle.

- CO2: To enable students to understand the benefits of nutrition, diet and psycho-physiological aspects of fitness.
- CO3: To help students to develop self-esteem, self- confidence, self-discipline and team spirits indicators of fitness.
- CO4: Promote fitness as a joyful activity.

Core Course(s) (2nd Year)

DSC-1: HISTORY OF INDIA – III: 750 – 1200 (Semester – III)

On successful completion of the course students will be able to:

- Critically assess the major debates among scholars about various changes that took place with the onset of early medieval period in India.
- Explain, in an interconnected manner, the processes of state formation, agrarian expansion, proliferation of caste and urban as well as commercial processes.
- Discuss the major currents of developments in the cultural sphere, namely Bhakti movement, Puranic Hinduism, Tantricism, architecture and art.

DSC-2: RISE OF THE MODERNWEST-I (Semester-III)

On successful completion of the course students will be able to:

- Outline important changes that took place in Europe from the mid-fifteenth century
- Aquire an integrated approach to the study of economic, social, political and cultural developments in Europe.
- Explain the process by which major transitions unfolded in Europe's economy, state forms, social structure and the cultural life. Examine elements of early modernity in these spheres.
- Critically analyse linkages between Europe's State system and trade and empire.

DSC-3: HISTORY OF MODERN CHINA (C.1840-1949) (Semester – III)

On successful completion of the course students will be able to:

- Develop an in-depth understanding of China's engagement with the challenges posed by imperialism, and the trajectories of transition from feudalism to a capitalist/ bourgeois modernity.
- To locate these historical transitions in light of other contemporaneous trajectories into a global modernity, especially that of Japan.

- Analyse significant historiographical shifts in Chinese history, especially with reference to the discourses on nationalism, imperialism and communism.
- Investigate the political, economic, social and cultural disruptions caused by the breakdown of the centuries old Chinese institutions and ideas and the recasting of traditions to meet modernist challenges.
- Comprehend the genesis and unique trajectories of the Chinese Communist Revolution.

DSC-1: HISTORY OF INDIA – IV: c1200 – 1500 (Semester – IV)

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

- Discuss different kinds of sources available for writing histories of various aspects of life during the thirteenth to the fifteenth centuries.
- Critically evaluate the multiple perspectives from which historians have studied the politics, cultural developments and economic trends in India during the period of study.
- Appreciate the ways in which technological changes, commercial developments and challenges to patriarchy by certain women shaped the times.

DSC-2: RISE OF THE MODERNWEST-II (Semester-IV)

Upon completion of this course the student shall be able to:

- Explain major economic, social, political and intellectual developments in Europe during the 17th and 18th centuries.
- Contextualize elements of modernity in these realms.
- Discuss the features of Europe's economy and origins of the Industrial Revolution.
- Analyse the relationship between trade, empire, and slavery and industrial capitalism. Examine the divergence debate.

DSC-3: History of Modern Japan (c.1868-1950s) (Semester – IV)

On successful completion of the course students will be able to:

- Explain Japan’s attempts to create new institutional structures and recast traditions to encounter the challenges posed by the west.
- Analyse historiographical shifts in Japanese history in the context of global politics.
- Locate and contextualise the history of Japan in world politics.
- Critically discuss contemporary international studies with much greater clarity based on knowledge of history and culture of Japan.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

N.A. (The department does not offer any DSE in the III & IV semester)

Generic Elective Course(s) (GE) (Common Pool) (2nd Year)

GE-2: MAKING OF POST-COLONIAL INDIA (Semester III)

On successful completion of the course students will be able to:

- Draw a broad outline of history of the early years of the Indian Republic, focusing on the framing of the Constitution, the integration of princely states, the reorganisation of states and features of our foreign policy.
- Examine critically patterns of economic development in the early years of Independence and the subsequent shifts and the persistant problem of uneven development.
- Trace the broad history of political organisations at the national level and political developments in the regional contexts.
- Examine issues of critical relevance with respect to the assertion and mobilization in the movements on the questions of caste, tribe and women.

GE-4: EDUCATIONAL ARRANGEMENTS AND KNOWLEDGE IN MODERN INDIA (Semester IV)

On successful completion of the course students will be able to:

- To explain the diverse manner in which production of knowledge and its preservation and transmission took place through formal and informal socio-cultural networks within indigenous education in India at the eve of colonial encounter.
- It will enhance learners' comprehension of the complex historical trajectories of the expansion as well as limitations of educational opportunities in India during colonial and post-colonial periods.
- It will help them to analyse the issues of contemporary education in light of colonial trajectories of our historical development.

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC 3: MUSEUM AND MUSEOLOGY (Semester-III)

Upon completion of this course the student shall be able to:

- Understand museum as a resource center.
- Understand the historical process of institutionalization of archaeology and culture through museums.
- Develop an insight into the various roles of museum an organizer, preserver and manager of artifacts.
- And how museum is an effective center for dissemination of knowledge and information, and space for dialogue and interaction.
- Also develop some understanding about new museums.
- A student having studied this course will be skilled in culture and tourism based industries: possible employment includes tour guides, archaeology assistants, archivist, jobs in art galleries, museums, auction houses, researchers in NGOs and other institutions, culture and art based writing and journalism and on social media

SEC 4: READING THE ARCHIVE (Semester-IV)

After studying this course, the student will be able to:

- To expose students to a wide variety of archives used in historical work.
- To introduce students to scholarship that has critically and creatively used different kinds of primary sources.
- To develop skills to access, contextualize, and analyze primary sources and carry out research.
- A student having studied this course will be skilled in culture and tourism based industries: possible employment includes tour guides, archaeology assistants, archivist, jobs in art galleries, museums, auction houses, researchers in NGOs and other institutions, culture and art based writing and journalism and on social media

Value Addition Course(s) (VAC) (Common Pool) (2nd Year)

VAC 3: READING INDIAN FICTION IN ENGLISH (Semester-III)

This course will help students to:

- Familiarise themselves with Indian ethos and values through the prescribed works in English language.
- Critically analyse these works in the context of their own lives as well as a shared not-so-distant past.
- Develop their creative thinking capacities through reading such works of fiction.
- Realise the potential of fiction in bringing out social and cultural changes

OR

VAC 3: CULTURE AND COMMUNICATION (Semester-III)

Upon the completion of the course:

- Students will be able to appreciate the relevance of ancient Indian wisdom and core ethical values in our contemporary life.
- Students will be able to engage in a dialogue between the past and the present and inculcate the best principles towards a meaningful life.
- Students will be encouraged to involve themselves in team work and group activities to address challenges faced in metropolitan cities.
- Students will be able to develop communication skills, that is, analytical reading, empathetic listening, considerate speaking as well as informed writing.
- Extension activities will equip the students, drawn from diverse backgrounds, with life skills and confidence to integrate with a multicultural environment and work towards an inclusive community.
- Students will be encouraged to envisage and work towards an ethically robust society and thereby strengthen the nation.

VAC 4: ETHICS AND CULTURE (Semester-IV)

The Learning Outcomes of this course are as follows:

- Explore perspectives on ethics in thoughts, words and actions.
- Evolve ethical decision-making practices.
- Understand the need for an ethical society and culture.
- Introspect, become conscious of and assess one's stance in life
- Cultivate empathy, tolerance and compassion.
- Apply the values learnt in the course to everyday life.

Core Course(s) (3rd Year)

DSC-1: HISTORY OF INDIA- V: c. 1500-1600 (Semester – V)

On successful completion of the course students will be:

- Critically evaluate major sources available in Persian and vernacular languages for the period under study.

- Compare, discuss and examine the varied scholarly perspectives on the issues of the establishment and consolidation of the Mughal state.
- Explain the religious milieu of the time by engaging with some prominent religious traditions.
- Discuss how different means such as visual culture was used to articulate authority by the rulers.
- Discern the nuances of the process of state formation in the areas beyond the direct control of the Mughal state.

DSC-2: History of India – VI: c. 1750 – 1857 (Semester – V)

Upon completion of this course the student shall be able to:

- Outline key developments of the 18th century in the Indian subcontinent.
- Explain the establishment of Company rule and important features of the early colonial regime.
- Explain the peculiarities of evolving colonial institutions and their impact.
- Elucidate the impact of colonial rule on the economy.
- Discuss the social churning on questions of tradition, reform, etc. during the first century of British colonial rule.
- Assess the issues of landed elites, and those of struggling peasants, tribals and artisans during the Company Raj.

DSC-3: HISTORY OF MODERN EUROPE-I (Semester – V)

On completing this course, the students will be able to:

- Identify what is meant by the French Revolution.
- Trace short-term and long-term repercussions of revolutionary regimes and Empire-building by France.
- Explain features of revolutionary actions and reactionary politics of threatened monarchical regimes.
- Delineate diverse patterns of industrialization in Europe and assess the social impact of capitalist industrialization.
- Analyse patterns of resistance to industrial capital and the emerging political assertions by new social classes.

DSC-1: HISTORY OF INDIA-VII: 1600-1750s (Semester – VI)

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

- Critically evaluate the gamut of non-Persian contemporaneous literature available in the form of personal accounts and vernacular tradition.
- Describe the major social, economic, political and cultural developments of the times
- Explain the intellectual ferment of the seventeenth and eighteenth centuries and its relation to state policies.
- Discern the larger motives behind the Imperial patronage of art and architecture
- Understand the complexities of medieval Indian rural society and appreciate the resilience of the mercantile communities in furthering the maritime trade of India with long term economic implications.

DSC-2: HISTORY OF INDIA-VIII: c. 1857-1950s (Semester – VI)

After successful completion of the course, the students will be able to:

- Identify how community, caste, and national identity developed in the late 19th, and early 20th centuries.
- Outline the social and economic facets of colonial India and their influence on the national movement.
- Explain the various trends of anti-colonial struggles in colonial India.
- Analyse the complex developments leading to partition and independence.
- Discuss the key debates on the making of the Indian Constitution, and need for socio-economic restructuring after independence.

DSC-3: HISTORY OF MODERN EUROPE-II (Semester – VI)

Upon completion of this course the student shall be able to:

- Trace varieties of nationalists and the processes by which new nation-stateswere carved out.
- Discuss the peculiarities of the disintegration of large empires and remaking ofEurope's map.
- Deliberate on the meaning of imperialism and the manifestations of imperialistrivalry and expansion in the 19th and early 20th century.
- Analyse the conflict between radical and conservative forces, and the gradualconsolidation of ultra-nationalist and authoritarian regimes in Europe.
- Contextualise major currents in the intellectual sphere and arts.

Discipline Specific Elective Course(s) (DSE) (3rd Year)

DSE-1: GENDER IN INDIAN HISTORY UP TO 1500 (Semester V)

On successful completion of this course students shall be able to:

- Explain critical concepts such as gender and patriarchy and demonstrate their use as tools for historical analysis.
- Examine the role and functioning of power equations within social contexts in Indian history during the ancient and medieval period, in the construction of gender identities.
- Critically examine representations of gender in literature, art, focusing on ideas of love, manliness and religiosity.

DSE-2: History of Africa C.1500-1960s (Semester V)

Course Objectives:

- This paper offers a historical overview of the African continent. It traces major long-term continuities and changes in Africa's socio-economic structures, cultural life and political formations from the 16th century to the mid-twentieth century. The paper closely examines colonial trade and rule, as well as anti-colonial resistance. It offers a critical analysis of the immediate post-independence years, and situates the specific positioning of Africa in connected histories of a globalising world.

Learning Outcomes:

On completion of this course the student shall be able to

- Critique stereotypes on the African continent and outline major shifts in African history.
- Explain elements of change and continuity in the African political experience, political regimes and national formations, economy, society and cultural milieu from the 16th to 20th centuries.
- Contextualise the impact of colonialism on the African continent.
- Explain social protest and anti-colonial resistance in Africa, as well as practices of 'transculturation'.
- Discuss the dilemmas and contradictions emerging from the post-independence economic, social, political and cultural milieu.

DSE-1: GENDER IN INDIAN HISTORY, c. 1500-1950 (Semester VI)

Upon the successful completion of the course the students shall be able to:

- Critically assess popularly held notions about women in Islamic empires

- Examine critical issues of gender and power in the context of Early Modern and Modern Indian history.
- Examine the issues around the 'Women's question' in the modern period of Indian history.
- Discuss issues of gender in the context of partition and the post-partition period of the construction of the independent state.

DSE-2: History of Latin America C. 1500-1960s (Semester VI)

Course Objectives:

- This paper offers a historical overview of Latin America. It traces major long-term continuities and changes in Latin America's socio-economic structures, cultural life and political formations from the 16th century to the mid-twentieth century. The paper closely examines colonial trade and rule, as well as anti-colonial resistance. It offers a critical analysis of the immediate years post-independence, and situates the specific positioning of Latin America in connected histories of a globalising world.

Learning Outcomes:

On completion of this course the student shall be able to

- Critique stereotypes on Latin America and outline major shifts in Latin American history.
- Explain elements of change and continuity in Latin American polities, economy, society and cultural milieu from the 16th to 20th centuries.
- Contextualise the impact of colonialism on Latin America.
- Explain social protest and anti-colonial resistance in Latin America, as well as practices of 'transculturation'.
- Discuss the dilemmas and contradictions emerging from the post-independence economic, social, political and cultural milieu.

Generic Elective Course(s) (GE) (Common Pool) (3rd Year)

GE-5: TWENTIETH CENTURY WORLD HISTORY: 1900 – 1945 (Semester V)

On successful completion of the course students will be able to:

- Define world history, and the factors that determined it in the twentieth century.
- Understand key concepts like Modernity, Imperialism, Colonialism, etc.
- Comprehend the causes, events and consequences of the two World Wars, which acted as catalysts of historical change throughout the world.

- Understand the twentieth century revolutions and dictatorships in their various forms through various case studies.
- Appreciate why and how the world changed in the first half of the twentieth century, and the holistic nature of world history.

OR

GE-5: WOMEN IN INDIAN HISTORY (Semester V)

After successful completion of the course, students will be able to:

- Provide an elementary outline of gender as a concept and patriarchy as a historically constituted system of power.
- Explore women's experiences within specific contexts at specific historical moments.
- To discuss the material basis of women's experiences with reference to specific issues like ownership of property.

GE-6: MEDIA AND CINEMA (Semester VI)

Upon successful completion of the course, students will be able to:

- Delineate the historical context within which the beginnings of each mediaplatform can be understood.
- Analyze the state's attempts to control and organize media output through lawsand policies.
- Explain the conjunctures of technological breakthroughs, advances and largersocio-economic and political matrices.
- Better appreciate the trends in media production, and its efforts in engagingwith current ideological and socio-political issues.

OR

GE-6: GENDER IN MODERN WORLD (Semester VI)

After the completion of the course the students would be able to

- Understanding larger histories of patriarchy and feminism.
- Analyse gender realities in international contexts.
- Discuss issues of gender in world history in comparative frames.
- Delineate women's movements across different regions of the world.

Skill Enhancement Course (SEC) (Common Pool) (3rd Year)

SEC 5: MUSEUM AND MUSEOLOGY (Semester-V)

Upon completion of this course the student shall be able to:

- Understand museum as a resource center.
- Understand the historical process of institutionalization of archaeology and culture through museums.
- Develop an insight into the various roles of museum an organizer, preserver and manager of artifacts.
- And how museum is an effective center for dissemination of knowledge and information, and space for dialogue and interaction.
- Also develop some understanding about new museums.
- A student having studied this course will be skilled in culture and tourism based industries: possible employment includes tour guides, archaeology assistants, archivist, jobs in art galleries, museums, auction houses, researchers in NGOs and other institutions, culture and art based writing and journalism and on social media

SEC 6: READING THE ARCHIVE (Semester-VI)

After studying this course, the student will be able to:

- To expose students to a wide variety of archives used in historical work.
- To introduce students to scholarship that has critically and creatively used different kinds of primary sources.
- To develop skills to access, contextualize, and analyze primary sources and carry out research.
- A student having studied this course will be skilled in culture and tourism based industries: possible employment includes tour guides, archaeology assistants, archivist, jobs in art galleries, museums, auction houses, researchers in NGOs and other institutions, culture and art based writing and journalism and on social media

Value Addition Course(s) (VAC) (Common Pool) (3rd Year)

N.A.

11. COURSE: B.SC. (HONS.) MATHEMATICS

DEPARTMENT: MATHEMATICS

Program Outcomes

PO1: The programme covers the full range of courses, from classical Calculus to modern Cryptography, Information Theory, Network Security, Advanced Mechanics and Machine Learning. The course lays a structured foundation of Calculus, Real & Complex Analysis, Abstract Algebra, Differential Equations (including Mathematical Modeling), Geometry of Curves and Surfaces, Linear Analysis and Topology. Courses to be offered during the four-year program and Interdisciplinary programs includes Probability and Statistics, Linear Programming, Numerical Methods, Mathematical Finance, Coding Theory, Mechanics, Biomathematics, Dynamical Systems, Integral Transforms, Mathematical Data Science, Optimization Techniques, Discrete Mathematics, Industrial Mathematics and Machine Learning. Also hand on sessions in Computer Lab using various Computer Algebra Systems (CAS) soft wares such as SageMath, Mathematica, MATLAB, Maxima and R with Simulation using Spreadsheet and LaTeX to have a deep conceptual understanding of the above tools are carried out to widen the horizon of students' self-experience.

PO2: In order to build strong foundation for research, the curriculum provides opportunity to the students beyond the traditional classroom to explore the area of their specialization in the final semesters VII and VIII. An amalgam of papers having flavour in abstract and applicable mathematics with application-oriented papers in DSC, DSE and SEC pool provides enough tools to take up research projects in the final year thus carving the path towards research.

PO3: Pursuing a degree in mathematics will introduce the students to several interesting and useful ideas in preparations for a number of allied and interdisciplinary careers. The well-structured programme will empower the students better with skills and knowledge leading to enhanced career opportunities across the range of sectors.

Course Outcomes: B.Sc. (Hons.) Mathematics (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC-1: Algebra (Semester I)

The course will enable the students to:

- Determine number of positive/negative real roots of a real polynomial.
- Solve cubic and quartic polynomial equations with special condition on roots and in general.
- Employ De-Moivre's theorem in a number of applications to solve numerical problems.
- Use modular arithmetic and basic properties of congruences.

- Recognize the algebraic structure, namely groups, and classify subgroups of cyclic groups.

DSC-2 Elements of Real Analysis (Semester I)

The course will enable the students to:

- Understand the fundamental properties of the real numbers, including completeness and Archimedean, and density property of rational numbers in **R** .
- Learn to define sequences in terms of functions from **N** to a subset of **R** and find the limit.
- Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate the limit superior and limit inferior of a bounded sequence.
- Apply limit comparison, ratio, root, and alternating series tests for convergence and absolute convergence of infinite series of real numbers.

DSC-3: Probability and Statistics (Semester I)

The course will enable the students to:

- Understand some basic concepts and terminology—population, sample, descriptive and inferential statistics including stem-and-leaf plots, dot plots, histograms and boxplots.
- Learn about probability density functions and various univariate distributions such as binomial, hypergeometric, negative binomial, Poisson, normal, exponential and lognormal.
- Understand the remarkable fact that the empirical frequencies of so many natural populations exhibit bell-shaped (i.e., normal) curves, using the Central Limit Theorem.
- Measure the scale of association between two variables, and to establish a formulation helping to predict one variable in terms of the other, i.e., correlation and linear regression.

DSC-4: Linear Algebra (Semester II)

The course will enable the students to:

- Visualize the space $\mathbb{R}^n$ in terms of vectors and their interrelation with matrices.
- Familiarize with basic concepts in vector spaces, linear independence and span of vectors over a field.
- Learn about the concept of basis and dimension of a vector space.
- Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation with application to computer graphics.

DSC-5: Calculus (Semester II)

The course will enable the students to:

- The notion of limits, continuity and uniform continuity of functions.
- Geometrical properties of continuous functions on closed and bounded intervals.
- Applications of derivative, relative extrema and mean value theorems.
- Higher order derivatives, Taylor's theorem, indeterminate forms and tracing of curves.

DSC-6: Ordinary Differential Equations (Semester II)

The course will enable the students to

- Learn the basics of differential equations and compartmental models.
- Formulate differential equations for various mathematical models.
- Apply these techniques to solve and analyze various mathematical models.
- Solve first order nonlinear differential equations, linear differential equations of higher order and system of linear differential equations using various techniques.

Generic Elective Course(s) (GE) Common Pool (1st Year)

GE-1(i) Fundamentals of Calculus (Semester I)

The course will enable the students to:

- Understand continuity and differentiability in terms of limits.
- Describe asymptotic behaviour in terms of limits involving infinity.
- Understand the importance of mean value theorems and its applications.
- Learn about Maclaurin's series expansion of elementary functions.
- Use derivatives to explore the behaviour of a given function, locating and classifying its extrema, and graphing the polynomial and rational functions.

GE-1(ii) Theory of Equations and Symmetries (Semester I)

The course will enable the students to:

- Understand the nature of the roots of polynomial equations and their symmetries.
- Solve cubic and quartic polynomial equations with special condition on roots and in general.
- Find symmetric functions in terms of the elementary symmetric polynomials.

GE-2(i) Analytic Geometry (Semester II)

The course will enable the students to:

- Learn concepts in two-dimensional geometry.
- Identify and sketch conics namely, ellipse, parabola and hyperbola.
- Learn about three-dimensional objects such as straight lines and planes using vectors, spheres, cones and cylinders.

GE-2 (ii) Introduction to Linear Algebra (Semester II)

The course will enable the students to:

- Visualize the space $\mathbb{R}^n$ in terms of vectors and the interrelation of vectors with matrices.
- Understand important uses of eigenvalues and eigenvectors in the diagonalization of matrices.
- Familiarize with concepts of bases, dimension and spanning sets in vector spaces
- Learn about linear transformations and its corresponding matrix.

Skill Enhancement Course(s) (SEC) Common Pool

SEC1: Programming using Python (Semester I)

The course will enable the students

- To provide exposure to basic problem-solving techniques with computers.
- To develop logical thinking abilities and to propose novel solutions for real-world problems through programming language constructs.
- To deepen the empirical knowledge on applying programming in business domain.

SEC2: Document Preparation & Presentation Software (Semester II)

The course will enable the students:

- To develop proficiency in the use of document preparation software such as document LaTeX, LibreOffice.
- To make a presentation using LaTeX, LibreOffice.
- To serve as a tool for conveying/communicating one's ideas, views, and observations.

Value Addition Course(s) (VAC) Common Pool (1st Year)

VAC1: Vedic Mathematics-I (Semester I)

The course will enable the students to:

- Foster love for maths and remove its fear through Vedic Mathematics.

- Enhance computation skills in students through Vedic Mathematics.
- Develop logical and analytical thinking.
- Promote joyful learning of mathematics.
- Discuss the rich heritage of mathematical temper of Ancient India.

VAC2: Vedic Mathematics-II (Semester II)

The course will enable the students to:

- Foster the love for mathematics by creating a positive attitude through Vedic and Ancient Indian Mathematics.
- Help students appreciate ancient Indian Mathematics and its contribution to the world.
- Enhance computational proficiency by involving procedures in Linear and Matrix Algebra.
- Improve geometrical thinking by understanding the basic tenets of geometry such as construction of line segments, angles, triangles and circles as used in Ancient India.
- Develop conceptual knowledge of mathematical concepts.
- Appreciate the need of conceptual knowledge over procedural processes.

Core Course(s) (2nd Year)

DSC-7: GROUP THEORY (Semester – III)

On successful completion of the course students will be:

- Analyse the structure of 'small' finite groups, and examine examples arising as groups of permutations of a set, symmetries of regular polygons.
- Understand the significance of the notion of cosets, Lagrange's theorem and its consequences.
- Know about group homomorphisms and isomorphisms and to relate groups using these mappings.
- Express a finite abelian group as the direct product of cyclic groups of prime power orders.
- Learn about external direct products and its applications to data security and electric circuits.

DSC-8: RIEMANN INTEGRATION (Semester – III)

After completion of the course, a student will

- Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Riemann sums to the volume and surface of a solid of revolution.
- Get insight of integration by substitution and integration by parts.
- Know about convergence of improper integrals including, beta and gamma functions.

DSC-9: DISCRETE MATHEMATICS (Semester – III)

This course will enable the students to:

- Understand the notion of partially ordered set, lattice, Boolean algebra with applications.
- Handle the practical aspect of minimization of switching circuits to a great extent with the methods discussed in this course.
- Apply the knowledge of Boolean algebras to logic, set theory and probability theory.

DSC-10: **SEQUENCES AND SERIES OF FUNCTIONS (Semester – IV)**

This course will enable the students to:

- Learn about Cauchy criterion for uniform convergence and Weierstrass *M*-test foruniform convergence of series of real-valued functions.
- Know about the constraints for the inter-changeability of differentiation, and integrationwith infinite sum of a series of functions.
- Handle the convergence of power series and properties of the limit function, includingdifferentiation and integration of power series.
- Appreciate utility of polynomials in the space of continuous functions.

DSC-11: MULTIVARIATE CALCULUS (Semester – IV)

This course will enable the students to:

- Learn the conceptual variations when advancing in calculus from one variable to multivariable discussion.
- Understand the maximization and minimization of multivariable functions subject to the given constraints on variables.
- Learn about inter-relationship amongst the line integral, double, and triple integral formulations.
- Familiarize with Green's, Stokes' and Gauss divergence theorems, and learn applications.

DSC-12: NUMERICAL ANALYSIS (Semester – IV)

This course will enable the students to:

- Learn some numerical methods to find the zeroes of nonlinear functions of a single variable, up to a certain given level of precision.
- Learn Gauss−Jacobi, Gauss−Seidel methods to solve system of linear equations.
- Get aware of using interpolation techniques, for example in finding values of a tabulated function at points which are not part of the table.
- Learn finding numerical solutions of difference equations which are obtained converting differential equations using techniques from calculus.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE-1 (i): GRAPH THEORY (Semester III)

This course will enable the students to:

- Learn modelling of real-world problems by graphs.
- Know characteristics of different classes of graphs.
- Learn representation of graphs in terms of matrices.
- Learn algorithms to optimize a solution.
- Understand some properties of graphs and their applications in different practical situations.

DSE-1 (ii): MATHEMATICAL PYTHON (Semester III)

This course will enable the students to use Python:

- For numerical and symbolic computation in mathematical problems from calculus, algebra, and geometry.
- To tabulate and plot diverse graphs of functions and understand tracing of shapes, geometries, and fractals.
- To prepare smart documents with LaTeX interface.

DSE-1 (iii): NUMBER THEORY (Semester III)

This course will enable the students to:

- Use modular arithmetic in solving linear and system of linear congruence equations.
- Work with the number theoretic functions, their properties and their use.

- Learn the forms of positive integers that possess primitive roots and the Quadratic Reciprocity Law which deals with the solvability of quadratic congruences.
- Understand the public-key cryptosystems, in particular, RSA.

DSE-2(i): BIOMATHEMATICS (Semester IV)

This course will enable the students to:

- To learn and appreciate study of long-term behavior arising naturally in study of mathematical models and their impact on society at large.
- To understand spread of epidemic technically through various models and impact of recurrence phenomena.
- Learn what properties like Chaos and bifurcation means through various examples and their impact in Bio-Sciences.

DSE-2(ii): MATHEMATICAL MODELING (Semester IV)

This course will enable the students to:

- Understand the methodology of solving SIR models for disease spread.
- Learn significance of dieting model that provides important insights and guides to a biomedical issue that is of interest to the general public.
- Understand nonlinear systems and phenomena with stability analysis ranges from phase plane analysis to ecological and mechanical systems.
- Use Monte Carlo simulation technique to approximate area under a given curve, and volume under a given surface.

DSE-2(iii): MECHANICS (Semester IV)

This course will enable the students to:

- Understand necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces.
- Apply the concepts of center of gravity, laws of static and kinetic friction.
- Learn that a particle moving under a central force describes a plane curve and know the Kepler's laws of the planetary motions.
- Evaluate the hydrostatic pressure at any given depth in a heavy homogeneous liquid at rest under gravity.

Generic Elective Course(s) (GE) (Common Pool) (2nd Year)

GE-3 (i): DIFFERENTIAL EQUATIONS (Semester III)

This course will enable the students to:

- Solve the exact, linear, Bernoulli equations, find orthogonal trajectories and solve rate problems.
- Apply the method of undetermined coefficients and variation of parameters to solve linear differential equations.
- Solve Cauchy-Euler equations and System of linear differential equations.
- Formulate and solve various types of first and second order partial differential equations.

GE-3 (ii): LATTICES AND NUMBER THEORY (Semester III)

This course will enable the students to:

- Understand the notion of ordered sets. Learn about lattices, distributive lattices, sublattices and homomorphisms between lattices.
- Become familiar with Boolean algebra, Boolean polynomials, switching circuits and their applications.
- Learn the concept of Karnaugh diagrams and Quinn–McCluskey method which gives an aid to apply truth tables in real-world problems.
- Learn about some fascinating properties of prime numbers, and some of the open problems in number theory, viz., Goldbach conjecture etc.
- Know about modular arithmetic and number-theoretic functions like Euler's Phi-function.
- Find quadratic residues and nonresidues modulo primes using Gauss's Quadratic Reciprocity Law.

GE-4(i): ELEMENTS OF REAL ANALYSIS (Semester IV)

This course will enable the students to:

- Understand the basic properties of the set of real numbers, including completeness and Archimedean with some consequences.
- Recognize bounded, convergent, monotonic and Cauchy sequences
- Learn to apply various tests such as limit comparison, ratio, root, and alternating series tests for convergence and absolute convergence of infinite series of real numbers.

GE-4(ii): LINEAR PROGRAMMING (Semester IV)

This course will enable the students to:

- Learn about the simplex method used to find optimal solutions of linear optimization problems subject to certain constraints.
- Write the dual of a linear programming problem.
- Solve the transportation and assignment problems.
- Learn about solution of rectangular games using graphical method and dominance.
- Formulate game to a pair of associated prima-dual linear programming problems.

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC 3: FRONT END WEB DESIGN AND DEVELOPMENT (Semester-III)

This course will enable the students to:

- Built wesite using the elements of HTML.
- Build interactive and stylish websites using the client side programming techniques with CSS and Javascript.
- Learn to validate client-side data.
- Define the structure and contents of the website using different features of CSS.

SEC 4: BACK END WEB DEVELOPMENT (Semester-IV)

After studying this course, the student will be able to:

- Interactive and Dynamic websites.
- Write the server side programming techniques with Django for accessing the contents to/from the server.
- Learn to validate server-side/backend data
- Use GET and POST methods for sending data within client and server.

Value Addition Course(s) (VAC) (Common Pool) (2nd Year)

VAC3: VADIC MATHS-1 (Semester-III)

After studying this course, the student will be able to:

- Overcome the fear of maths
- Improved critical thinking
- Familiarity with the mathematical underpinnings and techniques

- Ability to do basic maths faster and with ease.
- Appreciate the Mathematical advancements of Ancient India.

VAC4: FIT INDIA (Semester-IV)

After studying this course, the student will be able to:

- Adopt a healthy lifestyle.
- Knowledge of nutrition, diet and psycho-physiological aspects of fitness.
- Develop Self-esteem, Self-confidence, Self-discipline and team spirit as indicators of fitness.

Core Course(s) 3rd Year

DSC-13: Metric spaces (Semester – V)

This course will enable the students to:

- Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces.
- Analyse how a theory advances from a particular frame to a general frame.
- Appreciate the mathematical understanding of various geometrical concepts, viz. balls or connected sets etc. in an abstract setting.
- Know about Banach fixed point theorem, whose far-reaching consequences have resulted into an independent branch of study in analysis, known as fixed point theory.

DSC-14: Ring theory (Semester – V)

This course will enable the students to:

- Learn about the fundamental concept of rings, integral domains, and fields.
- Know about ring homomorphisms and isomorphisms theorems of rings, and construct quotient fields for integral domains.
- Appreciate the significance of unique factorization in rings and integral domains.
- Apply several criteria for determining when polynomials with integer coefficients have rational roots or are irreducible over the field of rational numbers.

DSC-15: Partial differential equations (Semester – V)

The course will enable the students to learn:

- The method of characteristics and reduction to canonical forms to solve first and second order linear/nonlinear partial differential equations.

- The macroscopic modeling of the traffic flow, where the focus will be on modeling the density of cars and their flow, rather than modeling individual cars and their velocity.
- The Cauchy problem and solutions of wave equations with initial boundary-value problems, and non-homogeneous boundary conditions.

DSC-16: Advanced group theory (Semester – VI)

This course will enable the students to:

- Understand the concept of group actions and their applications.
- Understand finite groups using Sylow's theorem.
- Use Sylow's theorem to determine whether a group is simple or not.
- Understand and determine if a group is solvable or not.

DSC-17: Advanced linear algebra (Semester – VI)

This course will enable the students to:

- Understand the notion of an inner product space in a general setting and how the notion of inner products can be used to define orthogonal vectors, including to the Gram-Schmidt process to generate an orthonormal set of vectors.
- Use eigenvectors and eigenspaces to determine the diagonalizability of a linear operator.
- Find the Jordan canonical form of matrices when they are not diagonalizable.
- Learn about normal, self-adjoint, and unitary operators and their properties, including the spectral decomposition of a linear operator.
- Find the singular value decomposition of a matrix.

DSC-18: Complex analysis (Semester – VI)

The accomplishment of the course will enable the students to:

- Grasp the significance of differentiability of complex-valued functions leading to the understanding of Cauchy-Riemann equations.
- Study some elementary functions and evaluate the contour integrals.
- Learn the role of Cauchy-Goursat theorem and the Cauchy integral formula.
- Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities, find residues, and apply Cauchy Residue theorem to evaluate integrals.

Discipline Specific Elective Course(s) (DSE) (3rd Year)

DSE-3(i) : Mathematical data science (Semester V)

The course will enable the students to:

- Gain a comprehensive understanding of data science, its mathematical foundations including practical applications of regression, principal component analysis, singular value decomposition, clustering, support vector machines, and k-NN classifiers.
- Demonstrate data analysis and exploration, linear regression techniques such as simple, multiple explanatory variables, cross-validation and regularization using R/Python.
- Use real-world datasets to practice dimensionality reduction techniques such as PCA, SVD, and multidimensional scaling using R/Python.

DSE-3(ii): Linear programming and applications (Semester V)

The course will enable students to

Learn about the basic feasible solutions of linear programming problems.

- Understand the theory of the simplex method to solve linear programming problems.
- Learn about the relationships between the primal and dual problems.
- Solve transportation and assignment problems.
- Understand two-person zero sum game, games with mixed strategies and formulation of game to primal and dual linear programing problems to solve using duality.

DSE-3(iii): Mathematical statistics (Semester V)

The course will enable the students to:

- Understand joint distributions of random variables including the bivariate normal distribution.
- Estimate model parameters from the statistical inference based on point estimation and hypothesis testing.
- Apply Rao-Blackwell theorem for improving an estimator, and Cramér-Rao inequality to find lower bound on the variance of unbiased estimators of a parameter.
- Understand the theory of linear regression models and contingency tables.

DSE-4(i): Mathematical finance (Semester VI)

The course will enable the students to:

- Know the basics of financial markets and derivatives including options and futures.
- Learn about pricing and hedging of options.

- Learn the Itô's formula and the Black−Scholes model.
- Understand the concepts of trading strategies.

DSE-4(ii): Integral tranforms (Semester VI)

The course will enable the students to:

- Understand the Fourier series associated with a periodic function, its convergence, and the Gibbs phenomenon.
- Compute Fourier and Laplace transforms of classes of functions.
- Apply techniques of Fourier and Laplace transforms to solve ordinary and partial differential equations and initial and boundary value problems.

DSE-4(iii): Research methodology (Semester VI)

The course will enable the students to:

- Develop researchable questions and to make them inquisitive enough to search and verify new mathematical facts.
- Understand the methods in research and carry out independent study in areas of mathematics.
- Write a basic mathematical article and a research project.
- Gain knowledge about publication of research articles in good journals.
- Communicate mathematical ideas both in oral and written forms effectively.

Generic Elective Course(s) (GE) (Common Pool) (3rd Year)

GE-5(i): Numerical methods (Semester V)

The course will enable the students to:

- Find the consequences of finite precision and the inherent limits of numerical methods.
- Appropriate numerical methods to solve algebraic and transcendental equations.
- Solve first order initial value problems of ODE's numerically using Euler methods.

GE-5(ii): Mathematical python (Semester V)

This course will enable the students to use Python:

- For numerical and symbolic computation in mathematical problems from calculus, algebra, and geometry.
- To tabulate and plot diverse graphs of functions and understand tracing of shapes, geometries, and fractals.

- To prepare smart documents with LaTeX interface.

GE-6(i) : Introduction to mathematical modelling (Semester VI)

The course will enable the students to:

- Learn basics of differential equations and compartmental models.
- Formulate differential equations for various mathematical models.
- Construct normal equation of best fit and predict the future values.

GE-6(ii): Discrete dynamical systems (Semester VI)

This course will enable the students to:

- Understand the basic concepts of difference equation, chaos and Lyapunov exponents.
- Obtain fixed points and discuss the stability of the dynamical system.
- Find Lyapunov exponents, Bifurcation, and Period-doubling for nonlinear equations.
- Analyse the behaviour of different realistic systems with chaos cascade.

Skill Enhancement Course (SEC) (Common Pool) (3rd Year)

SEC 3: Financial modelling with excel (Semester-V)

After completion of the course the learner will be able to:

- Compute present value and future value of a cashflow or annuity.
- Create loans and amortization tables, and find price, yield, and duration of a bond.
- Draw option payoff diagrams and option strategy diagrams.
- Find option price using Black-Scholes, and binomial models.

SEC 4: Yoga in practice (Semester-V)

- Students will form an understanding of the concept of yoga.
- Students will learn various aspects of the science of yoga.
- Theoretical and practical knowledge of Asanas and Pranayams to lead a balanced life.

Skill Enhancement Course (SEC) (Common Pool) VI SEMESTER

NA

Value Addition Course(s) (VAC) (Common Pool) SEMESTER V and VI

NA

12. COURSE: B.SC. (HONS.) PHYSICS

DEPARTMENT: PHYSICS

Program Outcomes

Students graduating with the B.Sc. (Honors) Physics degree should be able to acquire:

PO1: a fundamental/systematic and coherent understanding of the academic field of basic Physics in areas like Mechanics, Electricity and Magnetism, Waves and Optics, Thermal and Statistical Physics, Quantum Mechanics, Mathematical Physics, Classical Dynamics, Field concept of Electromagnetic effect, interaction of Light with Matter, matter properties, Statistical data analysis, relativistic effects, fundamental interactions and their applications to other core subjects in Physics;

PO2: a wide ranging and comprehensive experience in physics laboratory methods in experiments related to mechanics, optics, thermal physics, electricity, magnetism, digital electronics, solid state physics and modern physics. Students should acquire the ability for systematic observations, use of scientific research instruments, analysis of observational data, making suitable error estimates and scientific report writing.

PO3: procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service;

PO4: Knowledge and skills in areas related to their specialization area corresponding to elective subjects within the disciplinary/subject area of Physics and current and emerging developments in the field of Physics.

Program Specific Outcomes

Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics. Recognize the importance of mathematical modeling simulation and computational physics, and the role of approximation and mathematical approaches to describing the physical world. Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics.

Demonstrate relevant generic skills and global competencies such as

(i) problem-solving skills that are required to solve different types of Physics related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary area boundaries;

(ii) Investigative skills, including skills of independent investigation of Physics related issues and problems;

(iii) Communication skills involving the ability to listen carefully, to read texts and research papers analytically and to present complex information in a concise manner to different groups/audiences of technical or popular nature;

(iv) analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Physics and ability to translate them with popular language when needed;

(v) ICT skills;

(vi) Personal skills such as the ability to work both independently and in a group.

Demonstrate professional behaviour such as

(i) being objective, unbiased and truthful in all aspects of work and avoiding unethical, irrational behaviour such as fabricating, falsifying or misrepresenting data or committing plagiarism;

(ii) the ability to identify the potential ethical issues in work-related situations;

(iii) be committed to the free development of scientific knowledge and appreciate its universal appeal for the entire humanity;

(iv) appreciation of intellectual property, environmental and sustainability issues;

(v) promoting safe learning and working environment

Course Outcomes: B.Sc. (Hons.) Mathematics (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC-1: Mathematical Physics-I (Semester-I)

The emphasis of course is to equip students with the mathematical and critical skills required in solving problems of interest to physicists. The course will also expose students to fundamental computational physics skills enabling them to solve a wide range of physics problems. The skills developed during course will prepare them not only for doing fundamental and applied research but also for a wide variety of careers. After completing this course, student will be able to:

- Draw and interpret graphs of various elementary functions and their combinations.
- Understand the vector quantities as entities with Cartesian components which satisfy appropriate rules of transformation under rotation of the axes.

- Use index notation to write the product of vectors in compact form easily applicable in computational work.
- Solve first and second order differential equations and apply these to physics problems.
- Understand the functions of more than one variable and concept of partial derivatives.
- Understand the concept of scalar field, vector field, gradient of scalar field and divergence and curl of vector fields.
- Perform line, surface and volume integration and apply Green's, Stokes' and Gauss's theorems to compute these integrals and apply these to physics problems.
- Understand the properties of discrete and continuous distribution functions.
- In the laboratory course, the students will learn to: Prepare algorithms and flowcharts for solving a problem.
- Learn basic elements of programming language (Python or C++), Control structures of programming language, functional programming scientific libraries (Numpy, Matplotlib or Arrays, Gnuplot) etc. Students will design, code and test simple programs in Python/C++ to solve various problems related to the course.

DSC-2: Mechanics (Semester-I)

This course reviews the concepts of mechanics learned at school from a more advanced perspective and goes on to build new concepts. It begins with Newtonian dynamics in which it introduces the concept dynamics in different systems, work and energy, collision of rigid object, and talks about rotational dynamics, central force motion and ends with Special Theory of Relativity. The students will be able to apply the concepts learned to several real world problems. Upon completion of this course, students are expected to:

- Understand laws of motion and their application to various dynamical situations.
- Learn the concept of inertial reference frames and Galilean transformations. Also, the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.
- Understand translational and rotational dynamics of a system of particles. Apply Kepler's laws to describe the motion of planets and satellite in circular orbit.
- Understand concept of Geosynchronous orbits Explain the phenomenon of simple harmonic motion.
- Understand special theory of relativity – transformation of coordinates in inertial frames, special relativistic effects like time dilation, length contraction and simultaneity etc. and their effects on the mass and energy of a moving object.

- In the laboratory course, the student shall perform experiments related to mechanics: compound pendulum, rotational dynamics (Flywheel), elastic properties (Young Modulus and Modulus of Rigidity), fluid dynamics, estimation of least count, errors in the observations, graph plotting and data analysis, estimation of error etc.

DSC-3: Waves and Oscillations (Semester-I)

This course reviews the concepts of waves and optics learned at school from a more advanced perspective and goes on to build new concepts. It begins with explaining ideas of free oscillation, solving the system, superposition of harmonic oscillations leading to physics of traveling and standing waves. On successfully completing the requirements of this course, the students will have the skill and knowledge to:

- Understand Simple harmonic oscillation and superposition principle, compound pendulum, phase and frequency dependence in superposition, beats and superposition in in waves traveling in perpendicular direction. Understand the damping in oscillatory systems and forced oscillations, resonances, power dissipation. Understand Concept of normal modes in transverse and longitudinal waves: their frequencies and configurations. Understand the motion in waves etc.
- In the laboratory component of the course students will perform experiments that expose them to different aspects of real oscillatory systems, motion of coupled oscillators, study of Lissajous figures and behavior of transverse, longitudinal waves etc.

DSC-4: Mathematical Physics II (Semester-II)

The emphasis of course is on applications in solving problems of interest to physicists. The course will also expose students to fundamental computational physics skills enabling them to solve a wide range of physics problems. The skills developed during course will prepare them not only for doing fundamental and applied research but also for a wide variety of careers. After completing this course, student will be able to:

- Use curvilinear coordinates to solve problems with spherical and cylindrical symmetries.
- Represent a periodic function by a sum of harmonics using Fourier series.
- Obtain power series solution of differential equation of second order with variable coefficient using Frobenius method.
- Understand the properties and applications of Legendre polynomials.

- Learn about gamma and beta functions and their applications.
- In the laboratory course, the students will learn to: Apply appropriate numerical method to solve selected physics problems both using user defined and in-built functions from Python/C++/Scilab.
- The course will consist of practical sessions and lectures on the related theoretical aspects of the laboratory.
- Students will be able to find the root of a polynomial, Solve non-linear equations.
- Perform least square fitting of the data taken in physics lab by user defined functions.
- Interpolate a data by polynomial approximations. Generate and plot a function by its series representation.
- Generate and plot Legendre polynomials and verify their properties. Integrate a function and solve first order initial value problems numerically.

DSC-5: Electricity and Magnetism (Semester-II)

This course reviews the concepts of electromagnetism learned at school from a more advanced perspective and goes on to build new concepts. The course covers static and dynamic electric and magnetic fields, and the principles of electromagnetic induction. It also includes analysis of electrical circuits and introduction of network theorems. The students will be able to apply the concepts learned to several real-world problems. At the end of this course the student will be able to:

- Demonstrate the application of Coulomb's law for the electric field, and also apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Demonstrate an understanding of the relation between electric field and potential, exploit the potential to solve a variety of problems, and relate it to the potential energy of a charge distribution.
- Apply Gauss's law of electrostatics to solve a variety of problems.
- Calculate the magnetic forces that act on moving charges and the magnetic fields due to currents (Biot-Savart and Ampere laws).
- Understand the concepts of induction and self-induction, to solve problems using Faraday's and Lenz's laws. Understand the basics of electrical circuits and analyse circuits using Network Theorems.
- In the laboratory course the student will get an opportunity to verify network theorems and study different circuits such as RC circuit, LCR circuit. Also, different methods to

measure low and high resistance, capacitance, self-inductance, mutual inductance, strength of a magnetic field and its variation in space will be learned.

DSC-5: Electrical Circuit Analysis (Semester-II)

This course covers the basic circuit concepts in a systematic manner which is suitable for analysis and design. It aims at study and analysis of electric circuits using network theorems and two-port parameters. At the end of the course the student will be able to:

- Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and their difference.
- Solve complex electric circuits using network theorems.
- Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation. Evaluate the performance of two port networks.
- In the laboratory course the student will get an opportunity to verify Kirchhoff's law, Superposition Theorem, Norton's, Thevenin's and Maximum Power Transfer Theorem, measure capacitance of capacitor, time constants and frequency response, resonance, quality factor of different circuits. Also, they will explore above electrical properties using Arduino.

Generic Elective Course(s) (GE) (Common Pool) (1st Year)

GE: Mechanics (Semester-I)

This course begins with the review of Vectors and Differential equations and ends with the Special Theory of Relativity. Students will also appreciate the Fundamentals of dynamics, rotational dynamics and oscillatory systems, Gravitation and Elasticity. The emphasis of this course is to enhance the basic understanding of Newtonian mechanics and relativity. Upon completion of this course, students are expected to:

- Understand the role of vectors and coordinate systems in Physics.
- Learn to solve Ordinary Differential Equations: First order, Second order Differential Equations with constant coefficients. Understand laws of motion and their application to various dynamical situations.
- Learn the concept of inertial reference frames and Galilean transformations.
- Also, the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.
- Understand translational and rotational dynamics of a system of particles, moment of inertia of objects, motion of harmonic systems.

- Newtonian gravitation, Apply Kepler's laws to describe the motion of planets and satellite in circular orbit.
- Understand concept of Geosynchronous orbits. Understand special theory of relativity - special relativistic effects and their effects on the mass and energy of a moving object.
- In the laboratory course, the student shall perform experiments related to mechanics: compound pendulum, rotational dynamics (Flywheel), elastic properties (Young Modulus and Modulus of Rigidity), estimation of random errors in the observations etc.

GE: Electricity and Magnetism (Semester-II)

This course begins with theorems of network analysis which are required to perform the associated experiments in the laboratory. Then course delves into the elementary vector analysis, an essential mathematical tool for understanding static electric field and magnetic field. Introduces concept of electric and magnetic fields in vacuum and matter. By the end of the course, the student should appreciate laws of electrodynamics and Maxwell's equations. At the end of this course, students will be able to gain:

- Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and their difference.
- Solve complex electric circuits using network theorems. Understand the concepts of vector analysis.
- Apply Coulomb's law to line, surface, and volume distributions of charges. Apply Gauss's law of electrostatics to solve a variety of problems.
- Understand the effects of electric polarization and concepts of bound charges in dielectric materials. And Calculate the magnetic forces that act on moving charges and the magnetic fields due to currents (Biot-Savart and Ampere laws).
- Gain brief idea of dia, para and ferromagnetic materials.
- Understand the concepts of induction and self-induction, to solve problems using Faraday's and Lenz's laws. Have an introduction to Maxwell's equations.
- In the laboratory course the student will get an opportunity to understand working of Arduino Micro-controller System, to use Arduino to measure time, count events and time between events, to use Arduino to measure voltage/current/resistance, to use Arduino to measure various physical parameters like magnetic field, to verify network theorems and study different circuits such as RC circuit, LCR circuit and Bridges.

Skill Enhancement Course (SEC) (Common Pool) (1st Year)

Value Addition Course (VAC) (Common Pool) (1st Year)

13. COURSE: B.A. (HONS.) POLITICAL SCIENCE

DEPARTMENT: POLITICAL SCIENCE

Program Outcomes

A graduate in Political science is a person who embodies a curiosity towards the political puzzles that confront her and is endowed with the ability to apply various tools to solve them.

PO1: The undergraduate course encourages raising questions and a problem-solving thought process in its students, which it believes is central to the idea of shaping an informed graduate student and an active citizen.

PO2: Political science graduates receive a strong training in foundational concepts enabling them to distinguish and delineate features of each. This level of inquiry is further complicated as they proceed through the curricular semesters; enabling them to engage in systematic reflection of a kind that distinguishes their understanding from that of a lay person.

PO3: The undergraduate course in Political science shapes graduate sensibilities such that students are alert to instances of discrimination and deprivation; difference and diversity which they not only identify but can also persuasively argue about.

PO4: A Political science graduate is privy to the unique location of the discipline within the social sciences and can contextual their learning within the disciplinary boundaries while simultaneously and consciously using inter-disciplinary methods and concepts to understand inter-connected social, economic and political realities.

PO5: Political science graduates go through rigorous training in academic writing which includes writing logical and coherent essays as well as longer research articles in terms of term papers. Classroom debate and discussion encourage them to think on their feet; sharpen their submissions and argue persuasively. They are also introduced to a variety of writing including commentaries and original manuscripts; government reports and alternative assessments as well as visual and print media.

PO6: The discipline teaches students how to distinguish between various ideological orientations; the multiple lenses that may be used to make sense of the same political event or issue and thereby how to side-step biases and partisan positions in presenting their findings.

PO7: The discipline inculcates a culture of academic honesty and investigative rigour to ensure authentic analytical outcomes.

PO8: The syllabus of the undergraduate course on Political science also encourages students to get hands-on experience of how research in the discipline is conducted. They are encouraged to draw up research questionnaires, select the field and decide on sample size and method of selection, conduct interviews with respondents as well as focused group discussions, and finally translate the responses into a coherent write-up.

PO9: These exercises are not limited to election analysis and collecting voter responses but are primarily conducted to teach the student how to transition from the level of policy to the practice of politics.

PO10: Political science graduates are uniquely positioned as the undergraduate course also imparts an extensive understanding of international relations and global politics which allows them to move beyond the traditional area and concerns of the discipline.

PO11: The course not only introduces them to various theories and concepts within international relations but also includes a detailed discussion of contemporary international events and decisions made by state and non-state actors apart from also looking at the functioning of global and multinational organisations and institutions.

PO12: The perspective sharpens their understanding of the national and they can better appreciate the nuances of state policies.

PO13: The comparative perspective which students imbibe through courses in two semesters highlights the differences in states mapped along various indices such as development trajectories and state formation.

PO14: Along with a richer understanding of select areas students are also encouraged to reflect and think critically about Western frameworks of knowledge and understanding and how these may be challenged by alternative frameworks emerging in what is broadly referred to as the 'Global South' Courses on Public administration familiarize the student with the complexities of state and bureaucratic functioning as well as policy-making and advocacy.

PO15: The student learns about the concepts of organization and management and their application which is extremely relevant to unravelling the intricacies of large public organisations and corporate bodies.

PO16: The study of Indian politics provides the student with a means to navigate the labyrinth that politics in India reflects. Students decode this through various categories including gender, caste, class, ethnicity, and others while also effortlessly transiting across various levels of the national, subnational, and local.

PO17: These courses anchor the indispensability of the inter and multi-disciplinary lens and provide a corrective and challenge to the Western frameworks and models of understanding political phenomena.

PO18: On the completion of the six semesters of the undergraduate course in Political Science, a graduate is therefore equipped with an understanding of the six core areas in the discipline of political science namely Political theory, Indian politics, Comparative Politics, Public Administration, International relations, and Indian Political Thought.

PO19: They carry with them an understanding of research methods and investigation as well as field experience in institutional functioning and survey research. Given this diverse skill set and knowledge basket that the graduates have; the learning outcomes enable them to seek gainful employment and engagement in diverse sectors such as academics, journalism, law, social work, government agencies and research organisations, human resource development, management, marketing and also the bureaucracy.

Course Outcomes: B.A. (Hons.) Political Science (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC-1: Understanding Political Theory (Semester-I)

After completion of this course, students will

- Understand the various traditions and approaches of political theory and appreciate how they get reflected in organizing social living
- Understand multiple frames by which the idea of political community is debated
- Understand the significance of theorizing and relating theory to practice
- Acquire critical analytical vocabulary to address political questions in a reflected and theoretically informed way.
- Know how political theory provides a normative framework to resolve various social and political problems and issues.

DSC-2: Ideas and Institutions in Indian Political Thought (Semester-I)

At the end of this course, students would have acquired

- The knowledge of ideas of Indian political thought
- Acquaintance with institutions of Indian political thought
- Comprehensive understanding of Indian political thought
- Challenging the colonial mind set of underestimating India's rich historical past

DSC-3: Colonialism and Nationalism in India (Semester-I)

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

- Show an understanding of the nature of colonial rule in India and the various developments through which it consolidated itself.
- Demonstrate awareness of the specific impacts of colonialism on the Indian economy
- Show knowledge of the gradual emergence of the nationalist movement in India in response to the colonial rule

- Demonstrate an understanding of the distinct periods of the nationalist movement and the nature of resistance politics adopted in different phases
- Show awareness of the various social movements, the kind of questions they raised, and their contributions to the nationalist movement

DSC-4: Perspectives on Public Administration (Semester-II)

On completion of this course, the student can be expected to

- Have a comprehensive understanding of the conceptual roots of the discipline of Public Administration
- Understand how theorising is done in this discipline
- Understand how new perspectives like that of gender influence the orientation of both theory and practice in the discipline

DSC-5: Methods and Approaches in Comparative Political Analysis (Semester-II)

On successful completion of the course, students would demonstrate:

- An understanding of the nature, scope, methodology, and legacy of the sub-discipline.
- Awareness of the evolution of the sub-discipline of comparative politics and the challenge of Eurocentrism in the discipline.
- An in-depth understating of various approaches to the study of politics in a comparative framework.
- A basic training in comparative research.

DSC-6: Introduction to International Relations: Theories, Concepts and Debates (Semester-II)

At the end of this course, the students would have acquired:

- Familiarization with key theories, concepts, and debates of International Relations.
- Comprehensive re-reading of the origin of IR and its mainstream theories and concepts, with basic tools to question statist ontology and reification of eurocentrism.
- Appreciation of decolonial accounts that challenge the mainstream and parochial International Relations.
- Understanding of the genealogy and contributions of the IR scholarship in India to the disciplinary debates through a re-reading of its classical texts and, contemporary writings.

- Analysis of the assumptions and key concepts of IR such as power, sovereignty, empire and international order.
- Learning about the new directions in IR via a critical engagement with Global IR and the relational turn in IR.

Generic Elective Course(s) (GE) (Common Pool) (1st Year)

GE-1: Ideas in Indian Political Thought (Semester-I)

After completion of this course, students will be able to

- answer about the nature and form of statecraft that existed in Ancient India.
- explain how the texts in ancient India interpreted Dharma and Danda
- answer what were sources and mechanisms to practice Nyay in ancient India.
- make distinction between Rastra and Rajya.
- explain the meaning and foundations of Varna and how are they different from caste

GE-2: Introduction to the Indian Constitution (Semester-II)

On successful completion of the course, the students will demonstrate

- Knowledge of the origin and contents of the Indian Constitution
- Awareness of the rights and duties of the citizens and the obligations of the state
- Familiarity with the functioning of constitutional governance in India and the division of power between different tiers of the government.

Skill Enhancement Course (SEC) (Common Pool) (1st Year)

Value Addition Course (VAC) (Common Pool) (1st Year)

Core Course(s) (2nd Year)

DSC - 7: Political Theory: Concepts And Debates (Semester-III)

On successful completion of the course students will be able to:

- Understand the dimensions of shared living through these political values and concepts.
- Appreciate how these values and concepts enrich the discourses of political life, sharpening their analytical skills in the process.
- Instigate further developments of these concepts in new ways
- Develop an insight to some of the core political issues

- Develop critical analytical skill to evaluate core political debates and issues.
- Brings conceptual understanding and clarity to social, political, economic and cultural issues.

DSC-8: Ancient And Medieval Indian Political Thought (Semester-III)

After reading the course the students would be able to answer:

- What were the major institutions of government in ancient India and how did they function?
- How thinkers like Manu, Shukra, Brihaspati and Kautilya perceived the role of statecraft in society?
- What was the Nitisar tradition? How did it mark a difference from the Arthashastra tradition?
- The students will be able to answer how Kabir epitomised the syncretic traditions of India.
- What was the political and economic ideas of Tiruvallur and what was his take on ethics?

DSC-9: Constitutional Government And Democracy In India (Semester-III)

On successful completion of the course, students will demonstrate:

- understanding the specificities of Indian constitutionalism through a reading of the Constituent Assembly debates
- familiarity with the debates around constitutional architecture, institutional design and practice, and constitutional democracy
- awareness of the manner in which government functions through its various organs
- understanding of the division of power between various organs of the government at different levels.

DSC – 10: Public Administration In India (Semester-IV)

With this course, we expect that students will be able to:

- Have a clear picture of the complex institutional structure of Indian administration at Present
- Understand the building blocks of local governance, in rural and urban areas
- Explain the processes by which different budgeting systems work for this structure

- Analyse the processes of implementation of different social welfare policies by the administrative institutions.

DSC – 11: Concepts In Comparative Political Analysis (Semester-IV)

After studying this course, the students would

- acquire an understanding of a range of concepts such as nationalism and constitutionalism
- learn how to distinguish between different kinds of political systems based on their electoral design and party systems
- demonstrate knowledge of federal designs and ideas of political community based on different notions of nationalism
- understand development models historically and empirically

DSC– 12: Global Politics (Semester-IV)

At the end of the course, students would acquire

- a basic clarity on the meaning, nature and significance of global politics.
- ability to analyse global politics beyond its conventional Eurocentric accounts.
- conceptual tools to understand its dynamics in the contemporary context.
- an understanding of the debates on the changing nature of global politics in terms of de-globalization and post-globalization along with territorialization and deterritorialization.
- the ability to understand the operational aspects of geo-politics, geo-economics, and geo-strategy in the context of global politics.
- the skills to analyze discourses on cultural frames of global politics

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE – 1a: State Politics In India (Semester III)

On successful completion of the course, the students would demonstrate:

- Knowledge of the historical context and legal framework of the emergence of state politics in India
- Understanding of the phenomenon of state formation and reorganisation as part of both national and regional politics in India
- Awareness of the nature of agrarian politics in India and the political economy of states in India

- Knowledge of electoral politics and political leadership in states in India.

DSE – 1b: Indian Constitution: Key Debates (Semester III)

On successful completion of the course, the students will demonstrate:

- Knowledge of the process of constitution making and familiarity with Constituent Assembly debates
- An understanding of the framing of debates in the Constituent Assembly and the forms in which they have remained significant
- An understating of the principles that undergirded the debates and the constitutional values that they sought to entrench

DSE – 2a: Gandhi And The Contemporary World (Semester IV)

After reading this module the student will be able to answer:

- What are the core principles of Gandhian thought on which he scrutinizes all actions?
- How Gandhi applied those principles in shaping his positions on social, political, economic and religious questions?
- The students will be able to answer how Gandhi presented the critique of the Western Civilization.
- The students will be able to know the position of Gandhi on key questions of contemporary debates in India like Religious conversion, protection of cow, language issue and Hinduism.
- The student will be able to know how Gandhi's use of the term Swadeshi does not just limit to economic aspects but all gametes of national life.

DSE-2b: India's National Security: Major Challenges And Strategic Thinking (Semester IV)

At the end of the course, students would acquire the ability to:

- Understand the ways in which, the security threats to India have evolved historically and how have these been met.
- Appreciate the intellectual and historical foundations of Indian strategic thinking.
- Develop a nuanced understanding of India's strategic culture.
- Learn about India's internal and external security threats in its multifarious dimensions.

- Understand how India has evolved a whole array of strategic responses such as nonalignment, forging strategic partnerships and bilateral as well as multilateral partnerships to address diverse challenges it faces.

Generic Elective Course(s) (GE) (Common Pool) (2nd Year)

GE-3: Nationalism In India (Semester III)

On successful completion of the course, students would:

- Gain an understanding of the different theoretical views on the emergence and development of nationalism in India and the tensions that existed between them
- Demonstrate knowledge of the historical trajectory of the development of the nationalist movement in India, with specific focus on its different phases
- Understand the contribution of various social movements in the anti-colonial struggle
- Demonstrate awareness of the history of partition and independence

GE-4: Understanding International Relations (Semester IV)

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

- Understand the nature of the contemporary world in which we live through connected histories, economies and societies.
- Analyze the ways in which our world is shaped in both territorial and non-territorial forms leading to basic planetary understandings of both human and non-human relations.
- Enhance cognitive abilities to map out the multiple and complex interactions in international relations between peoples, histories and civilisations.
- To understand the role of the state and its interface with the market, probe into the cultural identities of a nation, analyse global poverty and climate change politics.
- To critically analyse the politics of 'common yet differentiated responsibilities.'
- Think critically about issues of global inequalities, violence, and injustices in the age of globalization.
- Appreciate the ways in which aesthetic articulation(s) problematize and interrogate the international and our ways of being therein.

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC 3: Political Leadership and Communication (Semester III)

After studying this course, student will be to:

- have a professional/career-oriented insight by facilitating their journey as Media managers, policy makers, political analysts, Journalists, Public relations officers in government agencies, political parties and higher education.

Value Addition Course (VAC) (Common Pool) (2nd Year)

VAC 2: Gandhi And Education (Semester III)

The Teaching Outcomes of this course are as follows:

- Value Gandhian perspective on education
- Appreciate the significance of education in Indian languages
- Evaluate the application of Gandhian thoughts in NEP 2020
- Realise the principles of NEP 2020 in vocational and skill-oriented

VAC3: Culture And Communication (Semester IV)

The Teaching Outcomes of this course are as follows:

- Students will be able to appreciate the relevance of ancient Indian wisdom and core ethical values in our contemporary life.
- Students will be able to engage in a dialogue between the past and the present and inculcate the best principles towards a meaningful life.
- Students will be encouraged to involve themselves in teamwork and group activities to address challenges faced in metropolitan cities.
- Students will be able to develop communication skills, that is, analytical reading, empathetic listening, considerate speaking as well as informed writing.
- Extension activities will equip the students, drawn from diverse backgrounds, with life skills and confidence to integrate with a multicultural environment and work towards an inclusive community.
- Students will be encouraged to envisage and work towards an ethically robust society and thereby strengthen the nation.

Core Course(s) (3rd Year)

DSC - 13: Western Political Philosophy – I (Semester-V)

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

- Understand how to read and decode the classics and use them to engage contemporary socio-political issues.
- Connect with historically written texts and their interpretations.

- Clearly present their own arguments and thoughts about contemporary issues and develop ideas to engage with the latter.

DSC - 14: Modern Indian Political Thought (Semester-V)

After studying this course, the students will be able to:

- Develop critical understanding about modern Indian thought.
- Thematically explore ideas in order to locate the topical debates on important subjects on a historical trajectory
- Reflect over the diverse possibilities exhibited in the writings of the respective thinkers.
- Think about issues and debates in contemporary India from multiple vantage points including its historical significance in the Indian tradition.
- Develop toleration and respect for diverse opinion and at the same time, to admire and appreciate the plurality within the modern Indian intellectual tradition.

DSC – 15: Political Process In India (Semester-V)

On successful completion of the course, the students will demonstrate:

- Understanding of political process in India and its interaction with social cleavages of caste, class, gender, ethnicity and religion
- Familiarity with the ways in which the state in India responds to social groups and vulnerable sections
- Knowledge of political parties and the party system in India
- Awareness of the manner in which representation and electoral competition play out in Indian politics

DSC – 16: Public Policy (Semester VI)

After reading this module students will learn:

- The meaning of public policy and how different theories have emerged to understand it.
- How public policies are formulated? What are the agencies involved in it?
- How Public policies are monitored and evaluated? What are the important tools for it?
- What are the principles that are normally employed to evaluate public policies?
- What is corporate social responsibility and why it is important for the corporates to take up this responsibility?

DSC – 17: Comparative Political Systems (Semester VI)

- This paper will provide students with a comprehensive understanding of a range of political systems from different continents in a historical context.
- The students will engage in studying different countries in detail with reference to their political tradition and state formation, constitution and division of power, political parties and elections, political economy and contemporary challenges.
- The critical analysis of different political systems will delineate the institutional structures, processes and their functioning in these systems.
- The course content would also help students develop analytical skills to understand not just the similarities and differences but the uniqueness of some cases as well that highlight how the matrix of diverse determinants and variables result in different discourses in different countries.

DSC–18: India's Foreign Policy: Challenges And Strategies (Semester VI)

At the end of this course, the students would have acquired:

- basic knowledge of the sources, theoretical perspectives and key drivers of India's foreign policy.
- analyse the opportunities and challenges India faces in securing its interests as an emerging global power.
- an insight about India's position in changing global power equations particularly its bilateral ties with powerful nations like the US and Russia along with India's largest neighbour, China.
- an enhanced understanding of India's sub-regional, regional, and global issues of concern.
- grasp of India's negotiation strategies in dealing with global trade, environment, and security regimes.
- recognise the ways in which India deploys its soft power in the world.

Discipline Specific Elective Course(s) (DSE) (2nd Year) (3rd Year)

DSE – 3a: International Political Economy (Semester -V)

By the completion of the course the students would be able to:

- Develop a basic understanding of the structural functional linkages that connect the realms of politics and economics.
- Learn to use the conceptual tools and theoretical frameworks for understanding the nature and basic functioning of the international political economy.

- Understand the structural drivers that determine the contours of international trade and finance.
- Develop an understanding about the Global South's contribution to this field both in the domain of ideas and working of the global political economy.
- Understand how our economic life is getting transformed on account of the information and communication technology, the cyber economy and interventions of the global civil society.

DSE – 3b: Understanding Ambedkar (Semester V)

- The course is designed to provide students the original writings and ideas of Ambedkar on diverse issues beyond caste and equip them to critically engage with the ideas, interpretations.
- By engaging with the original sources as well as secondary writings on Ambedkar's ideas that cover, caste, class, gender, religion, state, democracy and constitution the students will be able to understand a thinker in the context and contemporaneity.
- At the end of the course, students shall be equipped with the method of understanding the ideas, philosophy and relevance of a particular thinker.
- Students shall also be able to reflect on the method of the thinker's engagement with the then context, issues and concepts. Finally, the students shall be equipped in understanding the conceptual and philosophical diversity, situatedness and significance of Ambedkar beyond his contribution in the sphere of social justice and drafting the Indian constitution.
- The course thus provides an opportunity to the students to understand Ambedkar for his several important contributions in the field of religion, state, democracy, gender, economy and history.

DSE – 4a: Understanding Security (Semester VI)

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

- Develop a comprehensive understanding of the concept of security and how it relates to other key concepts such as power, peace and identity in International Relations.
- Learn about the traditional and non-traditional sectors and various levels of analysis of security.
- Understand the traditional and contemporary approaches to study the concept of security

- Analyse the range of security issues and challenges in the contemporary world and nature of policy response to them
- Develop analytical skills to understand the non-western perspectives to the concept of security.

DSE – 4b: Understanding Savarkar (Semester VI)

At the end of the course:

- The students will be able to understand his role and contribution in the freedom movement.
- They will be able to contextualise his thoughts on Hindutva and differentiate it from Hinduism.
- Students will be able to answer what impact religious conversion has on the cultural and political geography of a nation.
- They will be able to understand how he differed from Ambedkar on caste and untouchability questions and what was his response to this important question.

DSE – 11: Research Methods In Politics (Semester VI)

On successful completion of the course, students would demonstrate:

- Preliminary training in basic elements of social science research
- Familiarity with how to conceptualize a research problem
- Familiarity with diverse methodologies used in the study of politics
- Skills to identify and understand the use of specific methodologies in a text

Generic Elective Course(s) (GE) (Common Pool) (3rd Year)

GE-5: Governance: Issues And Challenges (Semester VI)

On successful completion of the course, the students will be

- acquainted with the changing nature of governance in the era of globalization.
- introduced to the most contemporary ideas of sustainable development and green governance.
- familiarised with a rigorous introduction to the best practices in India on good governance.

GE-6: Western Political Philosophy (Semester VI)

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

- Understand how to read and decode the classics and use them to engage contemporary socio-political issues.
- Connect with historically written texts and their interpretations.
- Clearly present their own arguments and thoughts about contemporary issues and develop ideas to engage with the latter.

Skill Enhancement Course (SEC) (Common Pool) (3rd Year)

SEC-3: Cyber Sphere And Security: Global Concerns (Semester V)

After studying this course, student will be to:

- apprehend key terms of cyber domain and identify cyber threats.
- understand cyber law concepts, intellectual property and Digital Rights Management.
- diagnose and examine basic security loopholes, anomalous behaviour in internet.
- understand principles of web security.
- secure and protect personal data with safe Internet usage.
- assimilate approaches for incident analysis and response, risk management and best cyber security practices.

Value Addition Course (VAC) (Common Pool) (3rd Year)

N.A.

14. COURSE: B.A. (HONS.) SANSKRIT

DEPARTMENT: SANSKRIT

Program Outcomes

Course Outcomes: B.A. (Hons.) Sanskrit (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC-1: Applied Sanskrit (Semester I)

- The students will be able to understand the general structure of Sanskrit language.
- The students will be able to write and communicate in simple Sanskrit.
- Students will become interested in learning the advance form of Sanskrit language.
- Students will be better equipped to handle the other courses of B.A. (Hons) Sanskrit.

DSC-2: Classical Sanskrit Literature (Poetry) (Semester I)

This course will help the students develop a fair idea of the works of great Sanskrit poets. Students will be able to appreciate the styles and poetic depictions of individual poets focusing on the poetical, artistic, cultural and historical aspects of their poetry works. The students develop the required skills for translation and interpretation of poetic works.

DSC-3: Indian Social Institutions and Polity (Semester I)

- Students will be aware of the forms and aspects of Indian social institutions and Indian polity as depicted and highlighted in Dharma and Shastra Literature.
- Students will understand and appreciate the contributions of ancient India in the academic domain of Social Science.

DSC 4: Classical Sanskrit Literature (Prose) (Semester II)

- The course will enable students enable students to familiarize themselves with some leading classical prose works and individual literary styles of their authors.
- After the completion of this course the learner will be exposed to the socio-cultural conditions of the Indian society as reflected in the prescribed texts.
- Course will also help students to develop their level of Sanskrit language comprehension.

DSC 5: Sanskrit Epics (Semester II)

- The students will be able to understand simple classical Sanskrit.
- The students will build a good vocabulary to write and communicate in Sanskrit.
- Students will become more aware of the impact of the epics on life and literature in India
- They will get acquainted with Advaita philosophy.

DSC 6: Critical Survey of Śāstric Literature (Semester II)

- The students will be able to understand the long history of Indian Śāstric Tradition.
- The students will be able to exhibit their understanding of the Indian Knowledge System.
- Students will become more aware of some aspects of Ancient Scientific thoughts and achievements.
- They will get acquainted with Ancient Scientific texts/writings.

Generic Elective (GE) (Common Pool)

GE-4: Sanskrit Narratology

Students will acquire the basic understanding of Sanskrit Narratives. They will be able to appreciate the essence of Sanskrit Narratology. They will develop an interest in Sanskrit Narratives and will be motivated to study the subject further.

GE-5: Tools And Techniques For Computing Sanskrit Language

- Learn the basic concept of Sanskrit Phonology, Sanskrit Morphology, Syntax, Semantics, Lexicon and Corpora.
- Learn the origin and Development of Language Computing.
- Basic Introduction of Computing Sanskrit Language.
- Various methodologies used on Language Technology.
- Various tools developed for Sanskrit Language.
- Survey of Language Computing.

GE-6: Machine Translation: Tools and Techniques

- Learn the origin and Development of Machine Translation.
- Basic Introduction of Machine Translation.

- Human vs Machine Translation.
- Concepts to ideal various methodologies used on Machine Translation System.

Skill Enhancement Course (SEC) (Common Pool)

Yoga In Practice

- Student will form an understanding of the concept of yoga.
- Students will learn various aspects of the science of yoga.
- Theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

Value Addition Course (VAC) (Common Pool)

Yoga: Philosophy and Practice

- Understanding ways to harmonise the body and mind through Yoga.
- Disciplining the mind through practicing Yoga.
- Understanding of consciousness through practical training

Core Course(s) (2nd Year)

DSC-7: Classical Sanskrit Literature: Drama (Semester III)

- After completing this course, students will have a comprehensive understanding of the vast and rich classical Sanskrit dramatic tradition.
- As seen in the assigned texts, this course will improve the student's capacity for critical thinking on matters about culture, politics, morality, religion, etc.
- Students will graduate from the course with a foundational understanding of the formal structures and patterns of Sanskrit drama in the Natya Shastra tradition of Bharata

DSC-8: Sanskrit Linguistics (Semester III)

- After completing this course, students will be able to analyze Sanskrit language in light of the structures proposed by modern linguistics
- Students will gain a basic understanding of the modern development of the field of linguistics.

DSC-9: Indian Epigraphy I (Semester III)

- The students will know about the various kinds of inscriptions once this course is over.
- He will be well aware of the connection between historicity and epigraphy.

- Another goal of the course is to familiarize students with the various Sanskrit writing styles.
- The goal of this course is to familiarize students with the fundamentals of Sanskrit epigraphy, the only source that accurately captures the social structure, political climate, topography, and economics of the era.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE-6: Art of Balanced Living (Semester III)

- After completing this course, students will have a thorough understanding of the numerous ideas, elements, and problems raised by Sanskrit philosophical and religious literature.
- aims to force students to work on human resource management so they can be more productive and effective in day-to-day situations.

Generic Elective (GE) (Common Pool) (2nd Year)

GE 2 Basic Principles of Āyurveda (Semester III)

- Students will be able to gain a fair understanding of Ayurvedic Science (Medical Science) through this course.
- The learner will be able to analyze Indian herb classifications and constituent parts thanks to this course.
- The goal of the course is to raise students' awareness of traditional medical practices.
- Students will be familiar with the basic principles of the Science of Ayurveda.

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC - Yoga and Practice (Semester III)

- Students will form an understanding of the concept of yoga.
- Students will learn various aspects of the science of yoga.
- Theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

Value Addition Course (VAC) (Common Pool)

VAC – Yoga Philosophy & Practice (Semester III)

- Understanding ways to harmonize the body and mind through Yoga.
- Disciplining the mind through practicing Yoga.
- Understanding of consciousness through practical training.

AEC for B.A Hons & Prog (Semester III)

AEC 2: Sanskrit (Advance): Ancient Indian Economy

- Students will be able to understand the basic ideas of Indian economic philosophy that are covered in ancient Sanskrit texts like the Manusmṛiti, Kauṭilya's Arthaꞔāstra, and the Vedic Saṁhita.
- This session explores, via Sanskrit literature, the ancient Indian economic model and the state's financial development.
- Students should be able to compare ancient and modern taxation models as well as comprehend various facets of the taxation model in ancient India.

AEC 2: Sanskrit B (Intermediate): Administrative Structure in Kauṭilya's Arthaśāstra

- Students after completing this course will understand that even in an autocratic agrarian state, the public welfare was the most important aspect of Arthaśāstra.
- They will also be aware that King was the head and that his primary responsibilities were military, judicial, legislative, and executive, roles that currently fall under the purview of the president.
- The purpose of this course is to familiarize students with the various facets of administrative roles and duties as stated in Kauṭilya's Arthaśāstra.

AEC 3: Sanskrit C (Introductory): Culture and Society

- Students will learn about and evaluate the institution of marriage, the status of women, and Indian social institutions.
- They will have access to the main resources needed to comprehend the core of the Indian perspective on sociology.
- They will have the ability to carry out independent study in the aforementioned fields.
- They will be able to comprehend Indian society through this course as well.

Core Course(s) (3rd Year)

DSC-13: Veda and Upanishad (Semester V)

- After completing this course students will enhance the depth of Vedic knowledge and will be able to realize that ideas of Vedic seers are based on philosophical, moral, and scientific principles.

- After completing this course, understudies will without a doubt be able to communicate almost a few imperative Vedic verses with their meaning and education, and in this way, the basics of the devout life of India will be uncovered to them in its genuine frame.
- The understudies will be able to get it the quality of solidarity, and control of intellect, and will realize the significance of soil in their life.
- From the study of Upanishad, they will know about philosophical and Psychological insights of our ancestors and can develop this learning further for the benefit of themselves in particular and society in general.

DSC 14: Sanskrit Grammar: Laghusiddhāntkaumudī~

- Students who complete this course will comprehend the fundamental structural subtleties of Panini's grammar.
- They will learn about basic samdhi and how to compound patterns.
- they will be able to comprehend some of the most crucial Sanskrit primary and secondary suffixes.
- Their understanding of the Sanskrit language's structural patterns will be further enhanced by practicing the rules they have learned from reading the texts.

DSC-15: Introduction to Nyaya-Vaisheshika Philosophy

- Students will gain familiarity with the Nyaya-Vaisheshika school of Indian philosophy,
- they will be introduced to the three main Nyaya-Vaisheshika problems: ontology, epistemology, and causation.
- They will be able to interact with other Indian philosophy texts more easily as a result.

DSC-5 Indian Epigraphy & Paleography

- The contents of this course are related to the formation of the history of ancient India, so it is an interdisciplinary course within Sanskrit.
- Students of Sanskrit can understand how important a role Sanskrit-based inscriptions play in preparing history, and their knowledge of the language can help historians make a perfect history.
- Similarly, students of History will find themselves on the positive ground and directly in touch with material related to the history of ancient India.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE-10: Introduction to Sanskrit Poetics (Semester V)

- Students will gain an understanding of the basic ideas of Sanskrit poetry through this course.
- They will be able to distinguish between the different Sanskrit Poetics genres, understand the goals of Sanskrit Poetics, and evaluate a work's structure in light of the central ideas of Sanskrit Poetics.
- They can do so by understanding the basic ideas of Sanskrit poetry in the Indian tradition, which is founded on Kāvyaprakāūa and Sahityadarpana.

Generic Elective (GE) (Common Pool) (3rd Year)

GE-12 Ancient Indian Polity (Semester V)

- This course will enable the students to appreciate the fundamental concepts of Indian political thoughts discussed in ancient Sanskrit texts such as Vedic Samhitas, Mahābhārata, Purāṇas, Arthaśāstra, and other works known as Nītiśāstra.
- It is supposed to create an awareness of the various aspects of Indian political thoughts and institutions of polity and at the same time make the people politically conscious from time to time.
- They will be aware that Fundamental Concepts of Indian Political thought have been discussed in Dharma-śāstra literature as the scientific branches of knowledge in ancient India.

Skill Enhancement Course (SEC) (Common Pool) (3rd Year)

SEC Rangamanch (Semester V)

- The process of presenting a drama will only be known to the student.
- Jobs in this field for students after learning general information about theater.
- Students' personalities will be developed through theatrical activities.
- The students will acquire the ability to express themselves.

15. COURSE: B.A. (HONS.) SOCIOLOGY

DEPARTMENT: SOCIOLOGY

Program Outcomes

Course Outcomes: B.A. (Hons.) Sociology (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC 01: Introduction to Sociology (Semester-I)

The mandate of the course is to introduce the discipline of Sociology to students who may come from diverse academic backgrounds, training and capabilities. The course intends to introduce the students to a sociological way of thinking and to apply sociological concepts to everyday life. Students by the end of the course learn that individual choices are impacted by the social structures of which they are a part. They develop reflexive thinking skills for both self and society. They develop a sense of how common sense is limited to those who share the same spatialgeographical, social and cultural locations. The course also introduces the idea that the various aspects of society are interlinked with each other, thereby orienting them to the sociological relationship between individuals and groups. By understanding these relationships, the student develops a sense of how closely the lives of individuals are intertwined and impact each other. The course also introduces the students to the emergence of Sociology as a systematic and scientific field of study. The emergence of sociology as a discipline enables them to understand the changing conceptualization of what it means to be scientific. Course Learning Outcomes:

- Students learn to apply the sociological perspective in understanding how society shapes our individual lives.
- This provides a foundation for the other more detailed and specialized courses in sociology.
- Students learn how to read texts and to express thoughts and ideas effectively in writing. They also learn how to frame arguments cogently.

DSC 02: Sociology of India I (Semester-I)

Indian society is layered, complex and ever transforming. This course seeks to familiarize the students with this entity through a sociological lens by delineating its historical formations and the kaleidoscopic configuration of its various key elements. The aim here is to render the key sociological elements identified - Caste, Village, Classes, Gender, Family, Religions, Tribes, and Cities – as concrete and tactile. They are treated as relational and interlinked features of Indian society. The course presents structures and institutions of the society as dynamic and changing over a period; at the same time, it takes cognizance of the dynamism of the

interactions between them. The objective is to help students to understand Indian society as a vivid reality even as they acquire elementary sociological categories to grasp it and develop an awareness of the key processes that engender it. The course outcomes are as follows:

- Familiarization with Indian society seen through a sociological lens.
- Understanding of the inter-linkages between various elements of Indian society.
- Ability to enable critical examination of a shared social reality.

DSC 03: Introduction to Sociological Research (Semester-I)

The course is designed as a foundational introduction to sociological research. It will provide the student with an understanding of how the social sciences, mainly sociology and social anthropology comprehend the world. It will begin with basic explanation of the research process and move on to the components of research and enable students to learn best practices. The course learning outcomes are:

- Students are introduced to sociological research both from a theoretical and methodological perspective.
- The course enables students to read and critically evaluate a piece of research and move towards designing a simple research project.
- Students would be able to identify the difference between quantitative and qualitative methods.
- Students will learn about ethical and practical issues in research. 5. Students learn that research methods are universal and not bound by cultural location and that no one research method can adequately explain the world around them.

DSC 04: Sociological Perspectives (Semester-II)

The course aims: To introduce students to how society is studied by sociologists. To inculcate the ability to distinguish between different sociological perspectives. To introduce original sociological writing, to familiarize students with the rich texture of sociological prose and understand the need to engage with complex ideas about society. To make students alive to the productive tension between universal and particular in the development of theoretical approaches in sociology by understanding the social context of different theoretical approaches. The course outcomes are:

- Describe major theoretical perspectives in sociology and the context of their emergence.
- Read and critically engage with the original works of various sociological thinkers and interpret the central argument.
- Distinguish and compare different theoretical perspectives in sociology.

- Use theoretical perspectives to examine social realities.

DSC 05: Social Stratification (Semester-II)

The course intends: To introduce social stratification which is the systematic study of structured social inequalities as a substantive area that lies at the heart of sociology. To introduce students to theoretical perspectives and empirical studies that are integral to the discipline. To teach students how social inequality is constituted as a sociological problematique. To familiarize students with key concepts and theoretical perspectives that inform the study of stratification. To examine key axes of stratification such as caste, class, gender, ethnicity and race and their intersections. To familiarize students with key processes of stratification: social mobility and social reproduction. To appraise students of the multiple operations of social inequalities and the reproduction of inequality in society. The Course learning outcomes are as follows:

- Recognize social inequalities as a multifarious and culturally specific social reality.
- Define the concepts, outline the principal theories and recall the critical debates in the arena of social stratification.
- Appreciate the significance of sociological knowledge of social stratification for public discourse and translate the conceptual learning into well formulated sociological research projects.

DSC 06: Families and Intimacies (Semester-II)

This course seeks to sociologically examine the worlds of family, intimacy and marriage in their diverse forms while understanding changes in its structures and experiences of it. The course will equip students with a critical understanding of basic concepts and sociological explanations of the way in which socially embedded relationships of affect in the family and intimate relationships intersect with economies of power, work, and control over resources in contemporary societies. The course outcomes are:

- Examine the institutions of family and marriage as pivotal social institutions of intimacy from a sociological and socio-anthropological perspective.
- Discuss historical and socio-cultural perspectives on the understanding of marriage, family and intimacy.
- Problematize universality and outline and observe the structural and experiential realities of marriage and family.
- Identify the variations in family structures and experiences using ethnographic accounts from different socio-cultural contexts.

- Describe the critical implications of family change as they are related to social policy and legal issues.

Generic Elective Course(s) (GE) (Common Pool)

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 01: Sociology and Everyday Life (Semester-I)

This course is an invitation to a sociological vision, imagination, and practice - for students who are pursuing disciplines other than sociology. The course seeks to render sociology alive by illuminating its perspective, concepts and practice through a series of interesting sociological studies of everyday life. The course attempts to introduce sociology in an accessible and engaging way. The course begins with an introductory section that speaks of the spirit of sociology, followed by a substantive section where students are familiarized with key concerns and ideas of sociology using empirical studies of relatable aspects of everyday life. The course concludes with a small section that allows students to reflect on what they have learned in the course, and what they could do to put that learning into practice with a primer on the craft of doing sociology. The course outcomes are:

- Inculcating a sociological imagination.
- Familiarity with basic concepts of sociology.
- Grasp social groups, institutions and processes that engender everyday life.
- Preparation for a more enduring engagement with sociology.

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 02: Family and Intimacy (Semester-I)

This course seeks to introduce students to a range of contemporary concerns pertaining to family as a social institution from a sociological viewpoint and with an interdisciplinary orientation. It situates family in its historical, cultural, social and comparative contexts. The course enables students to examine the commonsensical notions of family by making them aware of the diversity of family forms and reconstitute it as a possible arena of justice. It aims to familiarize students with different aspects of family and intimate life using ethnographic accounts from India. Its objective is to enable students to examine the institution of family and analyse intimacy in a sociological way. The course learning outcomes are:

- An ability to examine the institution of family and realities of intimate experiences from a sociological perspective.
- Knowledge of diverse forms of the family within their appropriate historical contexts and comparative appreciation of their features.

- A disposition to constitute everyday spaces of family and intimacy as an arena of democracy, gender justice and empowerment.
- Making students aware of the symbiotic relationship between conceptual, ethnographic and critical literature in social sciences and demonstrating how they work in close tandem.
- To alert next-generation policymakers to take the questions of the intimacy with seriousness and make them integral to public reason and conversation.

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 03: Understanding Indian Society (Semester-I)

The Course is an interdisciplinary course on Indian society. The course throws light on different dimensions of Indian social life including institutional structures, processes and contemporary issues and challenges. The students will also engage with the historical processes and ideological tensions underlying the diversity and uniqueness of various social formations. Institutions and concepts like village, town, caste structure and politics, class dynamics, religion, tribes, family, gender and political economy in the context of India are also discussed. These building blocks and core processes of Indian Society are considered relationally and as intersecting fields. It will help students enables the capacity to invoke scientific and analytical attitude toward one's own society and its ongoing workings and evolution. It provides the cultural knowledge and research skills that would be necessary for problem-solving in the Indian context. The course outcomes are:

- Develop a reflexive and nuanced understanding of Indian Society
- Enable an understanding and sensitivity towards India's diversity and uniqueness.
- Help to analyse complex social phenomena, their arrangement and processes.
- Provide an intersectional understanding of complex social processes.

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 04: Gender, Power and Violence (Semester-II)

The course aims: To examine the varied expressions and ramifications of gendered violence in a variety of contexts. To understand and analyse gender violence as both routine and spectacular, and structural, symbolic and situated. To explain how gender is socially constructed, and increase awareness of the presence of gender violence on multiple bodies in varied locations and contexts. To identify and analyse social movements and everyday forms of resistance against gender violence. The course learning outcomes are:

- Establish the connections between the social construction of gender across cultures and the forms and experiences of gender violence.

- Describe and debate different theoretical perspectives on the genesis and manifestation of gender violence across societies and cultures and its personal, social, cultural, political and economic consequences.
- Analyse the significance of public discourse in general and the role of the state and public policy in addressing and curbing gender violence.
- Debate individual and collective struggles and strategies used to resist gender violence.

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 05: Sociology of Intimate Life (Semester-II)

The course intends: To introduce students to some of the processes that shape intimate life in contemporary societies. To explore the concept of intimacy and map the historical transformations this phenomenon has undergone. To chart the configuration of intimacy in our times in multiple dimensions such as institutions, gender, sexuality, love and care. To initiate discussion about ideals of equality and compassion in intimate relations. The course outcomes are:

- Outline sociological conceptions of intimacy.
- Describe the historical transformation of intimate relations and their present status.
- Appreciate the significance of intimate relationships in weaving and sustaining the social fabric.
- Apply this understanding of the interconnections between the public and private realms into policy making.

BA (H & Prog./MDS) Sociology: Generic Elective (GE) 06: Invitation to Sociological Theory (Semester-II)

The course aims: To familiarize students with fundamental sociological perspectives. To enable students to analyse social reality on the basis of these perspectives. To help students apply sociological theories to their lifeworld. The course outcomes are:

- Analyse the multiple dimensions of social reality.
- Compare and contrast different sociological perspective on these processes.
- Develop a critical orientation while observing and reviewing social realities.
- Apply various sociological theories to social contexts and thereby assessing the causes and consequences of various social phenomena.

Skill Enhancement Course (SEC) (Common Pool)

SEC 1: Personality Development and Communication (Semester-I)

The course aims: To develop inter-personal and effective communication skills. To develop problem solving skills and understand its influence on behaviour and attitudes of individuals. The course outcomes are:

- After studying this course students will be able to understand the importance of oral and written communication in day-to-day working of the organisation.
- After studying this course students will be able to develop inter-personal skills and problem solving skills.
- After studying this course students will be able to understand the role of body language in effective communication.

SEC 2: Working with People (Semester-II)

The course intends: To inculcate values in strengthening knowledge and skills in field work practice learning. To develop aptitude and attitude to work in the field. To enhance skills of self-awareness, self-development, goal setting and time management. The course outcomes are:

- Develop a practical understanding of using different skills while working with individuals and groups.
- Develop skills and competencies to work effectively in field settings.
- Acquire understanding about self, goal setting, networking, and communication.

Value Addition Course (VAC) (Common Pool)

VAC 1: Ethics and Culture (Semester-I)

The course aims to: To help students explore ethical and cultural dimensions of their lives. To provide a forum for students to pause, revisit their assumptions and beliefs, and become mindful of their thoughts, emotions and actions. To give the students an opportunity to express themselves and inquire into their decision making processes.To cultivate ethical values and participate in the creation of a society based on acceptance, compassion, and justice. The Course Learning outcomes are:

- Explore perspectives on ethics in thoughts, words and actions.
- Evolve ethical decision making practises.
- Understand the need for an ethical society and culture.
- Introspect, become conscious of and assess one's stance in life.
- Cultivate empathy, tolerance and compassion.
- Apply the values learnt in the course to everyday life.

VAC 2: Emotional Intelligence (Semester-II)

The course aims to: Introduce the concept of emotional intelligence, its models and components. Understand the significance of emotional intelligence in self-growth and building effective relationships. Identify the measures of emotional intelligence. The course outcomes are:

- Self-Awareness, Self-Management, Social Awareness & Relationship Management.
- Discover personal competence and techniques of building emotional intelligence.
- Gain insights into establishing positive relationships.
- Apply the values learnt in the course to everyday life.

Core Course(s) (2nd Year)

DSC-7: Sociology of India - II (Semester – III)

On successful completion of the course students will be:

- Demonstrate conceptual complexity of the idea of India and debates surrounding it.
- Identify the academic and public discourses on Indian society in the historical and social context.
- Analyse the the Indian Constitution as a product of the multiple nuanced social positions and debates.
- Develop critical and analytical thinking about studying India.

DSC-8: Political Sociology (Semester – III)

After completion of the course, a student will

- Delineate the history of sociological study of politics.
- Identify and compare the different perspectives in the sociological study of politics.
- Analyse how political phenomena are embedded in the social and historical contexts of societies.
- Apply the concepts learnt to formulate problematics emerging out of their own situations and historical circumstances.

DSC-9: Sociology of Religion (Semester – III)

- Identify and distinguish the sociological approach to religion.
- Apply knowledge of religious practices, customs, beliefs, and rituals to analyse relation between religion and society.
- Analyse the significance of religious faith and beliefs in the modern world

DSC-10: Sociological Thinkers-I (Semester – IV)

- *Outline* the key concepts and theoretical architecture of the sociological thought of Durkheim, Weber and Parsons.
- *Apply* the concepts and theories to conceptualize research questions to study and analysessocial realities.

DSC-11: Economic Sociology (Semester – IV)

Students will be able to:

- *Understand* the key concepts and theories of economic sociology as a specialised branch of knowledge.
- *Identify* the diverse ways in which the economy is embedded in other aspects of society and culture.
- *Use* sociological concepts and theories to understand and analyse the transformations of the economy and its key processes and institutions from a comparative perspective.
- *Generate* research questions and arguments about the intersections of economy and society.

DSC-12: Sociology of Gender (Semester – IV)

After the completion of the course, the students will have:

- *Identify* and explain key concepts in the sociology of gender.
- *Investigate* gendered inequalities in a comparative mode across time and space.
- *Analyse* gender in relation to other forms of social stratification and identities such as caste, class, family and work.

Discipline Specific Elective Course(s) (DSE)

DSE-1: Sociology of Work (Semester III)

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

- Learning about the socio-historical context of work, theoretical concerns and problems, and contemporary issues in the area of work and industry.
- Understanding work in its important social aspects such as gendered work, unpaid work, and alienation as different from its better-known economic dimension.
- Understanding work in its global dimensions including the mutual relation between work in underdeveloped societies and in developed ones.

- Developing a comparative perspective in the study of work, focusing on the differences in the social impact of work in western and non-western contexts.
- Understanding work in its various contexts such as formal and informal sectors,manufacturing and service sectors, home and work-place, etc.
- Learning about the complexities, disparities and inequalities in the area of work.

DSE-2: Sociology of Media (Semester IV)

Students will be able to:

- *Examine* the nature of media and its relation with society.
- *Describe* and *apply* the various theoretical perspectives and conceptual tools in the area of sociology of media.
- *Evaluate* contemporary mass media related issues in terms of their constitution and consequences.

Generic Elective Course(s) (GE) (Common Pool)

GE-3: Sociology of Climate Change (Semester III)

After doing this course, students will be able to:

- Demonstrate an understanding of the various sociological dimensions of climate change and sustainability.
- Generate sociological research on causes, course and consequences of climate change.
- Obtain skills to advance and assess solutions for social issues arising out of climate change.

GE-4: Sociology of Fashion (Semester IV)

Students will be able to:

- *Acquire* a basic knowledge of the theories and substantive issues in the sociology of fashion.
- *Identify* and assess the meanings of fashion in its various dimensions such as material culture, as identity, as an economic power, and aesthetic style.
- *Develop* an informed approach to read fashion in order to analyse and appraise relations between the economic, symbolic and socio-political aspects of contemporary society.

Skill Enhancement Course (SEC) (Common Pool)

SEC 3: Life Skill Education (Semester-III)

At the end of the semester the students will be able to

- Focus on development of values in strengthening knowledge and life skills, bringing high quality standards in field work practice-learning.
- Understand the strength-based life skill development, team work, innovate leadership, design thinking and career building skills
- Develop universal human values while utilizing life skills in field work

SEC 4: Negotiation and Leadership (Semester-IV)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to apply negotiation skills to obtain desired results.
- After studying this course, students will be able to understand the various aspects of a crisis situation for appropriate management.
- After studying this course, students will be able to learn how to manage complex negotiation situations.
- After studying this course, students will be able to understand the process of relationship building.
- After studying this course, students will be able to test and judge the legitimacy of the terms of negotiation

Value Addition Course(s) (VAC) (Common Pool)

VAC3: Social and Emotional Learning (Semester-III)

The Learning Outcomes of this course are as follows:

- Students will be able to become aware of oneself and the society.
- Make informed lifestyle choices and extend the self in the joy of giving.
- Develop empathy, compassion, connect with nature and evolve emotionally to create a more harmonious society.
- Cultivate sensitivity towards discriminatory practices and explore possible solutions.

VAC4: Culture and Communication (Semester-IV)

Course Outcomes

- Students will be able to appreciate the relevance of ancient Indian wisdom and core ethical values in our contemporary life.

- Students will be able to engage in a dialogue between the past and the present and inculcate the best principles towards a meaningful life.
- Students will be encouraged to involve themselves in team work and group activities to address challenges faced in metropolitan cities.
- Students will be able to develop communication skills, that is, analytical reading, empathetic listening, considerate speaking as well as informed writing**.**

Core Course(s) 3rd Year

DSC-13: Sociological Thinkers- II (Semester – V)

Students will be able to:

- *Understand* conflict, structural and practice-oriented perspectives in the discipline of sociology.
- *Conceptualise* research informed by these distinctive theoretical traditions of sociology.

DSC-14: Sociological Research Methods (Semester – V)

Students will be able to:

- *Understand* the deeper philosophical issues that underpin research.
- *Evaluate* the methodological validity of the claims made by theory.
- *Assess* research works for its methodological soundness.
- *Create* research designs for simple research projects.

DSC-15: Understanding Ethnographies (Semester – V)

Students will be able to:

- *Inculcate* interdisciplinary thinking between sociology, philosophy and literature, through reading classic and contemporary ethnographies.
- *Understand* the construction and representation of the ethnographic field.
- *Critically engage* with the research and data presented in ethnographic texts.

DSC-16: Sociological Thinkers- III (Semester – VI)

A Students will be able to:

- *Develop* a critical perspective in the analysis of contemporary social reality.
- *Apply* the concepts and theories necessary for sociological analysis of contemporary societies.

DSC-17: Sociology of Kinship (Semester – VI)

Students will be able to:

- *Identify* the methodological shifts in the study of kinship theories.
- *Apply* an analytical perspective on concepts relevant for understanding kinship
- *Understand* the coexistence of multiple perspectives in the study of family, marriage and kinship.
- *Recognise* the significance of technology in recasting kinship.

DSC-18 Environmental Sociology (Semester – VI)

Students will be able to:

- Understand the dynamic between natural and social worlds from a sociological perspective.
- Identify and grasp the fundamental principles and core theoretical debates of the discipline.
- Apply a sociological perspective on environment and contribute to research endeavours or public policy conversations that assess the causes, effects and possible solutions to environmental problems.
- Examine the intertwining issues of ecology and inequity and address the questions of environmental justice and ethics

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-3: Visual Culture (Semester V)

Students will be able to:

- *Apply* sociological concepts to understand and appreciate visuals and constitute their representations as matters of academic interest.
- *Demonstrate* 'visuality'/'visualization' as a technique of asserting power and dominance in society; simultaneously locating the subversive potential of alternative or 'countervisualities'.
- *Analyse* the operations of visuals in an age dominated by techniques of mass production and dissemination of images.

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5: Understanding Devolopment (Semester V)

Students will be able to:

- *Identify* and understand different ideas of, and approaches to, development.

- *Examine* the discourse of development as a relationship between developmental institutions, actors, policies and theories.
- *Analyse* the key features of developmental processes in post-colonial India.
- *Evaluate* developmental practices in different locations, moments, and contexts.

GE-6: Sociology of Tourism (Semester VI)

Students will be able to:

- *Develop* a theoretical understanding of tourism as a social category.
- *Apply* the perspective of commodification and social change in understanding tourism as a social activity.
- *Assess* the relationship between tourism, state, and communities in the context of globalisation

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC 5: Sustainable Ecotourism and Entrepreneurship (Semester-V)

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to develop next-generation ecological entrepreneurs
- After studying this course, students will be able to evolve eco-literate society by integrating market-based instruments with eco-cultural knowledge of traditional societies
- After studying this course, students will be able to practice ecological knowledge for wealth generation, environmental conservation, and popularization of Indian traditional knowledge

16. COURSE: B.SC. (HONS.) STATISTICS

DEPARTMENT: STATISTICS

Program Outcomes

PO1: B.Sc. (Hons.) Statistics programme is designed in such a way that students will be exposed to the real-world data related to industries and society, identifying the problems and working towards their solutions through various analytical and statistical techniques.

PO2: On completion of the programme students are expected to have acquired the skills of effective communication, critical thinking, social research methods and social outreach.

PO3: This course exposes the students to the beautiful world of Statistics and how it affects each and every aspect of our daily life.

PO4: The course is designed to equip students with all the major concepts of Statistics along with the tools required to implement them.

PO5: Introduction to computer software help them in analysis of data by making optimum usage of time and resources. These software give them the necessary support and an edge when progressing to their professional careers.

PO6: Exposure to plethora of real life data helps in honing their analytical skills. Having practical component with every paper invokes their exploratory side and fine-tunes the interpretation abilities. Such a pedagogy goes a long way in giving them the required impetus and confidence for consultancy startups/jobs in near future.

PO7: The structure of the course also motivates/helps the students to pursue careers in related disciplines, especially the data sciences, financial statistics and actuarial sciences.

Course Outcomes: B.A. (Hons.) Sociology (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC-1: DESCRIPTIVE STATISTICS (Semester-I)

The course aims: To tabulate statistical information given in descriptive form and to use graphical techniques to interpret. To understand various measures of central tendency, dispersion, skewness and kurtosis. Moments and its properties. Familiarize with quantitative and qualitative data and available statistical tools to analyse them. Finding linear correlation between two variates using different measures and studying their properties. Least square method of fitting of curves, regression lines and their elementary properties. The Course learning outcomes are as follows:

- Understand concepts of sample vs. population and get acquainted with different types of data /scales. Distinguish between primary and secondary data. Tabulate and plot

frequency distribution. Deals with numerical and graphical ways to describe and display data using histograms, stem and leaf plot and box plots.

- Calculate measures of central locations like mean, geometric mean, harmonic mean, median and mode and explain their properties.
- Calculate measures of the spread: variance, standard deviation, range and inter-quartile range and explain their properties.
- Understand the meaning of probability and probabilistic experiment. Familiarize with the four approaches to probability theory and particularly, the axiomatic approach and use and manipulate the four axioms of probability comfortably to derive the results of other set operations
- Understand and exploit Addition and Multiplicative laws of probability
- Understand the meaning of conditional probability, conditioning, and reduced sample space, compute joint and conditional probabilities. independence, total probability, Bayes' rule and applications.
- Understand the concept of a random variable, differentiate between independent and uncorrelated random variables, distinguish between discrete, continuous, random variables and be able to represent them using probability mass, probability density, and cumulative distribution functions, Univariate transformation and its application
- Understand expectation and its properties, Compute variance and covariance in terms of expectation. Solve problems based on expectation and its properties.

DSC-2: INTRODUCTION TO PROBABILITY (Semester-I)

The course intends to: Familiarize students with the mathematical basis of probability theory. Prepare students with important tools for statistical analyses at the undergraduate level. Promote understanding through real-world statistical applications. The Course learning outcomes are as follows:

- Understand the meaning of probability and probabilistic experiment. Familiarize with the four approaches to probability theory and particularly, the axiomatic approach, use and manipulate the four axioms of probability comfortably to derive the results of other set operations.
- Understand and use addition and multiplicative laws of probability, understand the meaning of conditional probability, conditioning, and reduced sample space, compute joint and conditional probabilities. independence, total probability, Bayes' rule and applications.

- Understand the concept of a random variable, differentiate between independent and uncorrelated random variables, distinguish between discrete and continuous, random variables and be able to represent them using probability mass, probability density, and cumulative distribution functions. Acquaint with Univariate transformation and its application.
- Understand expectation and its properties, Compute variance and covariance in terms of expectation. Solve problems based on expectation and its properties.

DSC-3: CALCULUS (Semester-I)

The course aims: To familiarize students with the basic mathematical tools. It helps students to understand the other statistical concepts. The Course learning outcomes are as follows:

- Understand to solve applied problems using differentiation and integration.
- Understand to solve applied problems under integral sign and changes of order of integration.

DSC-4: THEORY OF PROBABILITY DISTRIBUTIONS (Semester-II)

The course aims to: Acquaint students with requisite tools for problem-solving available in statistical methodology. Prepare students to handle two/three-dimensional data and familiarize them with different measures of association as well as regression. Introduction to various discrete and continuous distributions and their properties. The course outcomes are:

- Understand the role of expectation and its usefulness. Get familiar with different kind of generating functions and their strength and weaknesses
- Handle problems based on two-dimensional random variables using Jacobians and bivariate transformations.
- Understand and exploit various measures of correlation and regression for problem solving.
- Familiarize with the concept of partial and multiple correlation coefficients and their properties
- Get acquainted with various discrete and continuous distributions their properties and interrelations and solve problems based on them.

DSC-5: APPLIED STATISTICS I (Semester-II)

The course aims: To know the applications of Statistics and learn and apply these concepts in real life situations. will give exposure to two applied fields of statistics viz. Vital Statistics and

Index Numbers. They will be having hands on practice of working on the data related to above mentioned fields. This course will help them understand about the working of the Indian Official Statistical System. The course outcomes are as follows:

- Understanding of the distinction between Vital Statistics and Demography.
- Knowledge of basic measures of Mortality, Fertility, and Population Growth.
- Ability to construct of Life Tables.
- Understanding of fundamental concepts of Index Numbers.
- Ability to construct Price and Quantity Index numbers, Consumer and Wholesale Price Index Numbers.
- Knowledge of Official Statistical System in India, Statistical offices at the Centre and States along with their functions.

DSC-6: ALEGBRA OF STATISTICS (Semester-II)

Algebra serves as a building block that will enable students to learn more advanced techniques that will help them to solve problems more quickly and easily. The course outcomes are:

- Understanding the fundamental concepts of matrices and determinants
- Understanding of partitioning of matrices, Echelon form
- Solving Linear equations
- Knowledge of Vector spaces and Subspaces, Orthonormal Basis
- Identifying rank of a Matrix
- Computing generalized inverse, characteristic roots and vectors, quadratic forms

Generic Elective Course(s)(GE) (Common Pool)

GE1: INTRODUCTION TO STATISTICS (Semester-I)

The course aims at: Acquainting the students with descriptive data analysis. To introduce students to different measurement scales, qualitative and quantitative and discrete and continuous data. To help students to organise data into frequency distribution graphs, including bar graphs, histograms, polygons and ogives. Students should be able to understand the purpose for measuring central tendency, dispersion, skewness and kurtosis and should be able to compute them as well. Students should be able to understand theory of attributes, independence and association of attributes. The course outcomes are as follows:

- Introduction to Statistics, definitions and data classification
- Employ graphical displays of data, frequency distributions, analysing graphs.

- Apply numerical descriptions of data, measures of centre tendency, measures of dispersion, skewness and kurtosis.
- Understand theory of attributes.

GE2: TIME SERIES ANALYSIS AND INDEX NUMBERS (Semester-I)

The course introduces the concept of time series, its components, and their estimation. Also, the application of time series. It also introduces the concept, formulation, and application of index numbers. The course outcomes are as follows:

- Understand the concepts of time series and index numbers.
- Formulate, solve, and analyse the use of time series and index numbers for real-world problems.

GE3: BASIC STATISTICS (Semester-I)

The course aims: To summarize the data and to obtain its salient features from the vast mass of original data. To understand the concepts of probability and its applications. To understand the concept of random variables, probability distributions and expectation. The course outcomes are as follows:

- Apply the concepts of statistical population and sample, variables and attributes.
- Present tabular and graphical representation of data based on variables.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Employ moments and their use in studying various characteristics of data.
- Employ correlation and regression analysis of bivariate data

GE4: INTRODUCTORY PROBABILITY (Semester-II)

The course acquaints the students with the mathematical foundation of probability. It Familiarizes the students with important tools for statistical analyses at introductory level. It also gives an introduction to some common discrete and continuous distributions and their properties. The course outcomes are as follows:

- Understand the meaning of probability and probabilistic experiment. Various approaches to probability theory and in particular the axiomatic approach. Laws of probability, conditional probability, conditioning, and reduced sample space, compute joint and conditional probabilities. Bayes' rule and applications.

- Understand the concept of a random variable, expectation and its properties, Compute variance and covariance in terms of expectation. Moment generating function and its properties.
- Get familiar with some standard discrete and continuous distribution and the usefulness of Central Limit Theorem in daily life.

GE5: APPLICATIONS IN STATISTICS (Semester-II)

The course aims to acquaint students with the current official statistical system in India and also to familiarize students with important concepts of Demand Analysis. It gives an introduction to Utility and Production functions. The course outcomes are as follows:

- Understand the current and prevailing official statistical system in India, role of MoSPI, CSO, NSSO, and their important publication
- Understand the laws of demand and supply, Price and Income elasticity of demand.
- Differentiate between Partial and Cross Elasticities of Demand, Engel's law, Pareto's law, and different curves of concentration.
- Understand theory of utility function, Utility Curve, Marginal rate of substitution, Budget line, and Construction of Utility Curve.

Skill Enhancement Course (SEC) (Common Pool)

SEC1: ADVANCED SPREADSHEETS TOOLS (Semester-I)

The course aims: To enable the students to use excel for advanced data analysis. To make possible to draw graphs with automatic setting on excel. To equip the students to with automation skills on excel. To permit the data on matrix format wise and cross section wise to setup on excel. To enable the students to use excel for informed decision making. To allowing and exporting the data as in easy way on excel. The course outcomes are as follows:

- Students will be able to make meaningful representations of data in the form of charts and pivot tables.
- Students will be able to draw analysis on data using spreadsheets and use interpretation to make decisions.
- Students will be able to generate word documents with appropriate formatting layout, proofing.
- Students will be able to manage data for generating queries, forms and reports in a database.

SEC2: STATISTICAL SOFTWARE PACKAGE (Semester-II)

The course aims: To familiarize students with data analysis using a statistical software package like SPSS or any other equivalent. To provide skills for research analysis and increase employability. To lay a foundation for advance data analysis work and higher education. The course outcomes are as follows:

- Students will be able to understand basic functions of statistical software package for managing variables and generate descriptive statistics to describe the data and analyse data through graphs and charts.
- Students will be able to test differences in sample means.
- Students will be able to identify relationships between variables and develop models for predicting dependent variables on the basis of independent variables.
- Students will be able to understand data structures and identify clusters in data.
- Students will be able to identify principal components that are relevant from a host of variables.

Value Addition Course (VAC) (Common Pool)

VAC1: Financial Literacy

The course develops familiarity with different aspects of financial literacy such as savings, investment, taxation, and insurance. It helps to understand the relevance and process of financial planning. It promotes financial well-being. The course outcomes are as follows:

- Develop proficiency for personal and family financial planning
- Apply the concept of investment planning
- Ability to analyse banking and insurance products
- Personal tax planning

VAC2: Swachh Bharat

The course aims: To understand the developmental challenges with reference to sanitation infrastructure and practices. To build values of cleanliness, hygiene and waste management in diverse socio economic contexts. To understand planning of social policy and programmes. To use waste management techniques at community level. To instil a sense of service towards society and the Nation. The course outcomes are as follows:

- Understanding the significance of the Swachh Bharat Abhiyan.
- Ability to analyse and predict the sanitation challenges of India

- Determine the link between sanitation and development.
- Contribute to the Swachh Bharat Abhiyan through real time projects/fieldwork.

Core Course(s) (2nd Year)

DSC-7: Sample Surveys (Semester – III))

After completion of this course, students should have developed a clear understanding of:

- The fundamental concepts of population and sample
- The principles of sample survey
- The steps involved in selecting a sample
- Simple Random Sampling with or without replacement
- Stratified Sampling
- Systematic Sampling
- Ratio and Regression Methods of Estimation

DSC-8: Advanced Theory Of Probability Distributions (Semester – III)

The learning outcomes of this course are as follows:

- Students will be familiar with important advanced discrete probability distributions and their properties.
- Students will be familiar with important advanced continuous probability distributions, and their properties.
- They will be able to apply their understanding of these distributions in real life problems related to different areas of statistics.

DSC – 9: Mathematical Analysis (Semester – III)

After completing this course, students should have developed a clear understanding of:

- Fundamental properties of real number and real-valued functions.
- Analytical properties of sequences.
- Infinite series, their properties and different tests.
- Limits, continuity, differentiability and mean value theorems.
- Fundamentals of numerical analysis, interpolation, numerical integration and difference equation.

DSC-10: Sampling Distributions (Semester – IV)

After successful completion of this course, students will be able to:

- Understand the basics of convergence theory and its importance in limit laws.
- Apply the concept of the central limit theorem and the relevance of the theorem in inferential statistics.
- Analyze data by using suitable hypothesis testing procedures in real-life applications related to large and small samples.
- Apply the knowledge of the idea of sampling distributions and appreciate their importance in the field of statistics.
- Integrate the knowledge of various sampling distributions like chi-square, t, and F distributions in hypothesis testing problems.

DSC-11: Total Quality Management (Semester – IV)

After completing this course, students will be able to:

- Understand the concept of quality, its historical background, and ISO standards.
- Apply the statistical process control tools and product control tools.
- Understand the idea of Six sigma- Lean manufacturing, TQM
- Comprehend the Six sigma training plans, Voice of customers (VOC), Critical to Quality (CTQ)
- Analyze the data to find the root cause of defects through DMAIC (Define-Measure Analyze-Improve-Control).

DSC-12: Time Series Analysis (Semester – IV)

After successful completion of this course, students will be able to:

- Understand the important time series models and their applications in various fields.
- Formulate real-life problems using time series models.
- Use statistical software to estimate the models from real data, and draw conclusions and develop solutions from the estimated models.
- Use visual and numerical diagnostics to assess the soundness of their models.
- Communicate the statistical analyses of substantial data sets through explanatory text, tables, and graphs.
- Combine and adapt different statistical models to analyse larger and more complex data.
- Possess skills to understand the components and forecast values of a time series at future time points.

Discipline Specific Elective DSE(s)

DSE – 1A: Operational Research (Semester III)

After completing this course, students should have developed a clear understanding of:

- The fundamental concepts of Operational Research Techniques
- Linear Programming.
- Transportation and assignment problems
- Game Theory
- Inventory Models

DSE – 1B: Psychological And Educational Statistics (Semester III)

After completing this course, students should have developed a clear understanding of:

- The distinction between psychological measurement and physical measurement.
- Meaning of Test in Psychology and Education.
- Uses and limitations of psychological tests.
- Meaning and purpose of Item writing and analysis.
- Understanding concepts of reliability and validity of test scores and their differences.
- Converting raw scores into different transformed scores.
- Scaling rankings and ratings in terms of Normal Probability Curve

DSE-2A: Computer Programming In C (SEMESTER IV)

After successful completion of this course, students will be able to:

- Understand various data types, operators, library functions, Input/Output operations.
- Decision making and branching and looping.
- Use Arrays, Characters, and strings.
- Understand user-defined functions, and recursive functions.
- Storage class of Variables
- Apply Pointers and Structure
- Pre-processors: Macro substitution, macro with argument
- File inclusion in C, I/O operations on files.

DSE-2B: Advanced Techniques Of Sample Surveys (Semester IV)

After successful completion of this course, students will be able to:

- Understand Post Stratification.
- Determine the optimum number of strata and their construction

- Comprehend Circular systematic sampling
- Apply Ratio and Regression method of estimation under the Superpopulation model
- Use Cluster sampling, and Two-stage sampling
- Classify non-sampling errors

DSE-2C: Demography (Semester IV)

After successful completion of this course, students will be able to:

- Understand the various components of Demography, sources of demographic data collection and errors therein.
- Comprehend population potential, density and concentration.
- Analyse the completeness of registration data using the Chandrasekharan-Deming formula.
- Use concepts of Stable and Stationary Populations.
- Use Balancing Equations.
- Use Myer's and UN indices in evaluating age data.
- Apply measures of the aging of population.
- Understand the concept of Abridged life tables and their construction by Reed and Merrell method and Greville's method.
- Synthesize population estimation and projection by different methods.
- Use Graduation of mortality rates by Makeham's and Gompertz graduation formula.
- Fit of Logistic curve and Makeham's formula.
- Understand the scope of population studies and its relationship with other disciplines.

Generic Elective Course(s) (GE) (Common Pool) 2nd Year

GE – 3A: Sampling Distributions (Semester III)

After completing this course, students should have developed a clear understanding of:

- Basic concepts of hypothesis testing, including framing of null and alternative hypothesis.
- Hypothesis testing based on a single sample and two samples using both classical and p value approach.
- Chi square distribution.
- Analyze categorical data by using Chi square techniques.
- t and F distributions and their applications.

GE 4A: Basics Of Statistical Inference (Semester IV)

After successful completion of this course, students will be able to:

- Understanding of estimation theory, Point and interval estimations.
- Characteristics of a good estimator and different methods of estimation.
- Demonstrate the use of these techniques in data analysis.
- Develop the best/most powerful statistical tests to test the hypotheses regarding unknown population parameters by using the Neyman-Pearson theory.

GE 4B: Statistical Computing Using R (Semester IV)

After completing this course, students would have developed a clear understanding of:

- Various Graphical representation and interpretation of data.
- Automated reports giving detailed descriptive statistics.
- Understanding data and fitting suitable distribution.
- Testing of hypothesis, p-value and confidence interval.
- Random number generation and sampling procedures.
- Importing data, Code editing in R and flow controls if (), for (), while ()

Skill Enhancement Course (SEC) (Common Pool) 2nd Year

SEC 3-It Skills And Data Analysis I (Semester III)

At the end of the course students will be able to

- Represent and interpret data in tabular and graphical forms
- Understand and interpret the measures of central tendency and dispersion.
- Use IT tools such as spreadsheets to visualise and analyse data.

SEC 4- It Skills And Data Analysis II (Semester IV)

At the end of the course students will be able to

- Establish relationships between variables using correlation and regression analysis.
- Visualize functions and differentiate between linear and nonlinear functions.
- Use IT tools such as spreadsheets to visualise and analyse data.

Value Addition Course(s) (VAC) (Common Pool) 2nd Year

VAC 3-Swachh Bharat (Semester III)

The Learning Outcomes of the course are:

- Understanding the significance of the Swachh Bharat Abhiyan.

- Ability to analyse and predict the sanitation challenges of India
- Determine the link between sanitation and development.
- Contribute to the Swachh Bharat Abhiyan through real time projects/fieldwork.

VAC 4-FINANCIAL LITERACY (Semester IV)

The Learning Outcomes of this course are as follows:

- Develop proficiency for personal and family financial planning
- Apply the concept of investment planning
- Ability to analyse banking and insurance products
- Personal tax planning.

Core Course(s) (3rd Year)

DSC– 13: THEORY OF ESTIMATION (Semester V)

After completing this course, students will develop a clear understanding of:

- List desirable properties of point estimators based on an unknown parameter of a distribution viz. Unbiasedness, Consistency, Efficiency and Sufficiency.
- Derive the UMVUE of a parameter or function of a parameter (Using Cramer- Rao inequality, Rao-Blackwell theorem, and Lehmann- Scheffé Theorem).
- Understand and apply different techniques of finding optimal point estimators such as Maximum Likelihood Estimation, Method of Least Squares, Method of moments and the method of minimum chi-Squares
- Construct interval estimators, pivot method (Confidence Intervals) for unknown population parameters.

DSC–-14: LINEAR MODELS (Semester V)

After completion of this course, students will develop a clear understanding of:

- Theory and estimation of Linear Models.
- Gauss-Markov Theorem and its use.
- Distribution of quadratic forms.
- Simple and Multiple linear regression models and their applications.
- Fitting of these models to real or synthetic data, derivation of confidence and prediction intervals, and a sound scientific interpretation of the results.
- Techniques of Analysis of Variance and Covariance under fixed effects model.

- Assessment of the quality of the fit using classical diagnostics, awareness of potential problems (outliers, etc.) and application of remedies to deal with them.

DSC-15 : STOCHASTIC PROCESSES (Semester V)

After completing this course, students will develop a clear understanding of:

- The fundamental concepts of stochastic processes.
- Tools needed to analyze stochastic processes.
- Markov processes and Markov chains.
- Markov chain applications.
- Poisson process and its variations.
- Random walk and ruin theory

DSC– 16: TESTING OF HYPOTHESIS (Semester VI)

After completing this course, students will develop a clear understanding of:

- The notion of statistical hypothesis test, error and its nature and the idea of acceptance and rejection region.
- Identify simple and composite hypothesis. Find critical region, size and power of the test.
- Apply Neymann-Pearson lemma to find most powerful test. Find UMP and UMPU test. Make use of likelihood ratio principle for testing of hypothesis.
- Make distinction between parametric and nonparametric test. Identify suitable nonparametric test for both location and scale (Kolmogorov- Smirnov one sample and two sample tests, sign test, Wilcoxon signed rank test, run test. Median test, Kruskal-Wallis one-way analysis of variance by ranks, Friedman two-way analysis of variance by ranks).
- Derive SPRT for test the parameters of normal distribution, binomial and Poisson distributions also find OC function, Average sample Number etc. of a SPRT.

DSC–17: DESIGN OF EXPERIMENTS (Semester VI)

After completing this course, students will develop a clear understanding of:

- The fundamental concepts of design of experiments.
- Introduction to planning valid and economical experiments within given resources.
- Completely randomized design.
- Randomized block design.

- Latin square design.
- Balanced incomplete block design.
- Full and confounded factorial designs with two levels.
- Introduction to factorial designs at three levels.
- Fractional factorial designs with two levels

DSC –18: ECONOMETRICS (Semester VI)

After completing this course, students will develop a clear understanding of:

- Students will be trained to write a good quality undergraduate research paper in applied statistics using the econometric methods taught in this class.
- The fundamental concepts of econometrics.
- Specification of the model.
- Multiple Linear Regression.
- Multicollinearity.
- Heteroscedasticity.
- Autocorrelation.
- Autoregressive and Lag models

Discipline Specific Elective Course(s) 3rd Year

DSE– 3A: ACTUARIAL STATISTICS (Semester V)

After completing this course, students will develop a clear understanding of:

- Basics of Actuarial Science.
- Tools for applying actuarial methods in phenomena for financial research and insurance.
- computation of premiums and settlement of claims

DSE–3B: SIMULATION TECHNIQUES IN STATISTICS (Semester V)

After completing this course, students will possess skills concerning:

- Use of simulation to understand the behaviour of real-world systems.
- Ability to generate Pseudo-random numbers by the different methods.
- Random variable generation from theoretical distributions.
- Use of Monte Carlo methods and regenerative simulation.
- Ability to develop programs for the purpose of simulation.

DSE-3C-ENVIRONMENTAL STATISTICS (Semester V)

After completing this course, students will develop a clear understanding of:

- The role of Statistics in Environmental Science.
- Uses and applications of different Statistical distributions, sampling procedures, linear models and analysis of variance.
- Environmental monitoring.
- Time-series analysis and Spatial-data analysis.
- Censored data and risk assessment.
- They will be able to do risk analysis using spreadsheet.

DSE–4A: BIOSTATISTICS (Semester – VI)

After completing this course, students will develop a clear understanding of:

- The fundamental concepts of survival functions and their interrelationship.
- Survival models and their applications.
- Handling censored data and estimating mean survival time of the patients.
- Actuarial and Kaplan-Meier methods.
- Competing Risk Theory.
- Basic concept of Statistical genetics.

DSE–4B: ORDER STATISTICS AND ITS APPLICATIONS (Semester – VI)

On successful completion of the course, the student will be able to*:*

- Find joint, marginal distributions and conditional distributions of order statistics in the continuous and discrete case.
- Find the distribution of sample range and other systematic statistics in case of sampling from an arbitrary continuous population and from some specific continuous distributions such as uniform and exponential.
- Understand the Markov Chain property of order statistics in the continuous case.
- Learn how to obtain distribution-free confidence intervals for population quantile for population distributions based on order statistics.
- Understand the distribution-free bounds for moments of order statistics and of the range.
- Derive the recurrence relations and identities for moments of order statistics drawn from an arbitrary population (discrete or continuous), as well as from some specific distributions.

- Understand the concept of L-moments and L-moments estimation of parameters.
- Derive the Linear estimation of location and scale parameters based on the moments of order statistics.

DSE– 4D: RESEARCH METHODOLOGY (Semester – VI)

After completion of this course, students will develop a clear understanding of

- Research Methods.
- Research Problems.
- Research Designs.
- Comparative study of different methods of data collection.
- Guidelines for construction of questionnaires.
- Processing and Analysis of data.
- Interpretation and Report writing

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE -5A: INTRODUCTION TO STATISTICAL LINEAR MODELS (Semester V)

After completion of this course, students will have developed a clear understanding of:

- Theory and estimation of Linear Models.
- Gauss-Markov Theorem and its use.
- Distribution of quadratic forms.
- Simple and Multiple linear regression models and their applications.
- Fitting of these models to real or synthetic data, derivation of confidence and prediction intervals, and a sound scientific interpretation of the results.
- Techniques of Analysis of Variance under fixed effects model.
- Assessment of the quality of the fit using classical diagnostics,

GE – 5B: STATSTICAL TECHNIQUES FOR QUALITY CONTROL (Semester V)

After completing this course, students will develop a clear understanding of:

- Quality, Historical background, ISO standards.
- Statistical process control tools- Control charts for variables, attributes.
- Statistical product control tools- Sampling inspection plans, Dodge and Romig plans.

GE – 6A: SURVEY SAMPLING AND DESIGN OF EXPERIMENTS (Semester VI)

After completing this course, students will develop a clear understanding of:

- The basic concept of sample survey and its need.
- Simple random sampling.
- Stratified random sampling
- One-way and two-way analysis of variance.
- Basic concepts of design of experiments.
- Completely randomized design.
- Randomized design.
- Latin square design.
- Factorial experiments.

GE– 6B: STATISTICS IN ACTUARIES (Semester VI)

After completing this course, students will develop a clear understanding of:

- Statistics and Insurance applications
- Utility theory
- Principles of premium calculations
- Survival distribution and life tables
- Life insurance models and Life annuities

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC 5- STATISTICS WITH R

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to extract and Read data into R, manipulate, and analyse it
- After studying this course, students will be able Tto debug, organize, and comment R code
- After studying this course, students will be able to understand the R environment for downloading, installing, and using packages
- After studying this course, students will be able to do basic programming to write own functions
- After studying this course, students will be able to use loops
- After studying this course, students will be able to create standard and customized graphics

- After studying this course, students will be able to perform basic statistical operations and regression.

SEC 6-FINANINCIAL MODELING WITH EXCEL

After completion of the course, the learner will be able to

- Compute present value and future value of a cashflow or annuity.
- Create loans and amortization tables, and find price, yield and duration of a bond.
- Draw option payoff diagrams and option strategy diagrams.
- Find option pricing using Blackscholes and binomial model.

17. COURSE: B.SC. (HONS.) ZOOLOGY

DEPARTMENT: ZOOLOGY

Program Outcomes

PO1: The curriculum of B.Sc. Zoology (Hons.) has been designed in an integrated and cross-disciplinary manner with a comprehensive understanding of all living beings from microscopic to macroscopic, their relationships with the environment and unravelling their application value; their characteristics, economic importance etc. As it covers a fascinating range of topics, the modern zoologists need to have insight into many disciplines. B.Sc. (Hons.) degree in Zoology caters the needs of students in view of the evolving nature of animal sciences as a subject.

PO2: After Graduation in Zoology, students should gain an expertise which will help them in pursuing higher education from India or abroad; can carry out fieldwork, and seek jobs in academia, research or Industries etc. Students should be able to identify, classify and differentiate diverse chordates and nonchordates based on their morphological, anatomical and systemic organization, this will be mandatory if they want to pursue career in taxonomy.

PO3: They will also be able to describe economic, ecological and medical significance of various animals in human life. This will create a curiosity and awareness among them to explore the animal diversity and take up wild life photography or wild life exploration as a career option.

PO4: They will acquire practical skills in biotechnology, biostatistics, bioinformatics and molecular biology. Our students will be acquiring basic experimental skills in various techniques in the fields of genetics; molecular biology; biotechnology; qualitative and quantitative microscopy; enzymology and analytical biochemistry.

PO5: These methodologies will provide an extra edge to our students, who wish to undertake higher studies.

PO6: In-depth knowledge and understanding about comparative anatomy and developmental biology of various biological systems; and learning about the organisation, functions, strength and weaknesses of various systems will let students critically analyse the way evolution has shaped these traits in the human body.

PO7: Students undertaking skill enhancement courses like aquaculture will inculcate skills involved in rearing fish, set up their own fish farm, which would help them in starting their own ventures as entrepreneur and generating self employment

PO8: Acquired skills in diagnostic testings, haematology, histopathology, staining procedures etc. used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory.

PO9: Deep understanding of different physiological systems and methods available to measure vital physiological parameters and to comprehend the mechanism behind occurrence of different life threatening disease via laboratory examination, assessment of basic physiological functions by interpreting physiological charts will help to find their career options.

PO10: Students undertaking wild life management courses would gain expertise in identifying key factors of wild life management and be aware about different techniques of estimating, remote sensing and Global positioning of wild life.

PO11: This course will motivate students to pursue a career in the field of wildlife conservation and management.

Program Specific Outcome (PSO)

PSO1: B.Sc. (Hons.) Zoology covers diverse range of topics, is designed to cater to the needs of students in view of the evolving nature of animal sciences as a subject.

PSO2: After completion of this course, the in-depth knowledge about Identifying and classifying animals will provide students professional advantages in teaching, research and taxonomist jobs in various government organizations; including Zoological Survey of India and National Parks/Sanctuaries.

PSO3: Acquired practical skills in biotechnology, biostatistics, bioinformatics and molecular biology can be used to pursue career as a scientist in pharmaceutical and drug development industry in India or abroad.

PSO4: Our students will be acquiring basic experimental skills in various techniques in the fields of genetics; molecular biology; biotechnology; qualitative and quantitative microscopy; enzymology and analytical biochemistry.

PSO5: They can pursue career in genetic counselling, assisted reproductive techniques etc. These methodologies will provide an extra edge to our students, who wish to undertake higher studies.

PSO6: Students undertaking skill enhancement courses like aquaculture will inculcate skills involved in rearing fish, set up their own fish farm, which would help them in starting their own ventures as entrepreneur and generating self employment

PSO7: Acquired skills in diagnostic testings, haematology, histopathology, staining procedures etc. used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory.

PSO8: Deeper understanding of different physiological systems and methods available to measure vital physiological parameters and to comprehend the mechanism behind occurrence of different life threatening disease via laboratory examination, assessment of basic

physiological functions by interpreting physiological charts will help to find their career options.

PSO9: Students can enter into field of wild life management and conservation. They can also join many national and International organisations working for animal conservation and ethical issues.

Course Outcomes: B.A. (Hons.) Sociology (NEP UGCF 2022)

Core Course(s) (1st Year)

DSC 1: Nonchordata-Protists to Pseudocoelomates (Semester-I)

- This subject is aimed at learning about the importance of systematics, taxonomy and structural organization of animals and development of a sense of appreciation for the diversity of non-chordates living in varied habitats.
- The students will understand the evolutionary history and relationships of different non-chordates through functional and structural affinities.
- It will also help them to analyse the organization, complexity and characteristic features of non-chordates, making them familiarize with the morphology and anatomy of representatives of various animal phyla.
- Moreover students will form a comprehensive understanding of the economic importance of non-chordates, their interaction with the environment and role in the ecosystem.
- Studenced will have enhanced collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.

DSC 2: Biology of Cell: Structure and Function (Semester-I)

- The objective of this paper is to develop an understanding of a cell as a basic unit of life.
- This course is designed to enable the students to understand the structure and functions of cell organelles that are involved in various cellular processes.
- Students will be able to appreciate how the cells grow, divide, survive, die, and regulate all these processes.
- Students should be able to understand the process of cell signalling and its role in cellular functions.

- Students will have an insight into how defects in cell organelles functioning and regulation of cell processes can develop into various diseases. Students will learn various advancement made in the field of cell biology.

DSC 3: Concepts of Ecology (Semester-I)

Upon completion of the course, students are able to:

- Demonstrate an understanding of key concepts in ecology with emphasis on Historical perspective, role of physical factors and concept of limiting factors.
- Comprehend the population characteristics, dynamics, growth models and Interactions. Students will understand the community characteristics, ecosystem development and climax Theories.
- Knowledge about the types of ecosystems, food chains, food webs, energy models, and Ecological efficiencies.
- Application of the basic principles of ecology in wildlife conservation and management.
- Inculcate scientific quantitative skills, evaluate experimental design, read graphs, and analyse and use information available in scientific literature.

DSC 4: Non-Chordates II: Coelomates (Semester-II)

Upon completion of the course, students are able to:

- Learn about the importance of systematics, taxonomy and structural organization of animals.
- Appreciate the diversity of non-chordates living in diverse habit and habitats. Understanding evolutionary history and relationships of different non-chordates through functional and structural affinities.
- Critically think about the organization, complexity and characteristic features of non-chordates.
- Familiarize themselves with the morphology and anatomy of representatives of various animal phyla.
- Students are able to comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem.
- Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.

DSC 5: Fundamentals of Biomolecules (Semester-II)

Upon completion of the course, the students are able to:

- Gain knowledge and skill in the fundamentals of biochemical sciences, interactions and interdependence of physiological and biochemical processes. Get exposure to various processes used in industries and gained skills in techniques of chromatography and spectroscopy.
- Demonstrate foundation knowledge in biochemistry; synthesis of proteins, lipids, nucleic acids, and carbohydrates; and their role in metabolic pathways along with their regulation.
- Knowledge about classical laboratory techniques, use modern instrumentation, design and conduct scientific experiments, and analyze the resulting data. Get trained in proper procedures and regulations in handling and disposal of chemicals.

DSC-6: Human Physiology-Control and Coordination Systems (Semester-II)

Upon completion of the course, the students are able to:

- Knowledge of basic fundamentals and understanding advanced concepts which help them develop a strong foundation that will aid them in acquiring skills and knowledge to pursue advanced degree courses.
- Comprehend and analyze problem-based questions. Recognize and explain how all physiological systems work in unison to maintain homeostasis in the body and use of feedback loops to control the same. Learning an integrative approach to understand the interactions of various organ systems resulting in the complex overall functioning of the body.
- Synthesize ideas to make connections between knowledge of physiology and real-world situations, including healthy lifestyle decisions and homeostatic imbalances.
- Know the role of regulatory systems viz. endocrine and nervous systems and their amalgamation in maintaining various physiological processes.

Generic Elective Course(s) (GE) Common Pool

GE-1 Human Physiology (Semester-I)

- The students will be able to understand the principles of normal biological function in the human body.

- Students will learn basic human physiology and correlate it with histological structures.
- This course deals with structure of major human organs, their physiological functioning, and their roles in the maintenance of healthy individuals also the interplay between different organ systems and how organs and cells interact to maintain biological equilibria in the face of a variable and changing environments.
- After completion of this course the students will be able to understand the homeostasis in animals in response to changes in their external environment.

GE 2: Lifestyle Disorders (Semester II)

Upon completion of the course, the students are able to:

- Have a better understanding of lifestyle choices and the diseases associated with them.
- An in-depth understanding of making better lifestyle decisions. Students learn about various techniques for preliminary diagnosis of lifestyle disorders.
- The course aims to introduce the students to the concept of health, nutrition, and the factors affecting it.
- It will apprise students of the prevalence of emerging health issues affecting the quality of life.
- The course will facilitate the understanding of different physical and psychological associated disorders and their management for a healthy lifestyle. It highlights the important lifestyle-related disorders and describes the risks and remedies in relation to adopting a better life.

Skill Enhancement Course (SEC) Common Pool

SEC1: Personality Development and Communication (PDAC) (Semester-I)

The outcome of this paper is to develop an awareness on the skills including different types of communications, and inter and intra cultural communications that are required for one's personal as well as academic upliftment. It also helps to enrich the creativity to establish an individual/ organizational business or trade activities that involve negotiations, communications. This also helps the students for verbal and non- verbal communications, and to prepare any official report preparation. Some extent, it may also be useful to enhance the soft skills through modern computer based technology that are required in the routine personal as well as professional life.

SEC II: Formulation of Fish Feed (Semester-II)

After completion, of course: the students will be able to:

Identify the useful ingredients for fish feed formulation. Students can prepare fish feed using locally available ingredients. They can start their own Fish feed production industry. Initiate entrepreneurship on Fish feed production. This course provides first-hand training on identification of various indigenous ingredients for formulation of fish feed, and knowledge on the nutritional requirements of the cultivable species. Students gain knowledge on the impact of formulated feeds on fish growth and enhance the quality of aquacrops and increase the production.

Value Addition Course (VAC) Common Pool

VAC-1 Emotional Intelligence (Semester-I & II)

After completion of course, students will be able to

- Learn Self-Awareness, Self-Management, Social Awareness & Relationship Management. Students will be able to discover personal competence and techniques of building emotional intelligence.
- Students will gain insights into establishing positive relationships.

Core Course(s) 2nd Year

DSC-7: Diversity Of Chordates (Semester – III)

On successful completion of the course students will be able to :

- Correlate the importance of systematics, taxonomy, and structural organization of chordates.
- Recognize the diversity of chordates living in varied ecological habitats.
- Critically analyse the organization, complexity and characteristic features of chordates.
- Comprehend the economic importance of chordates, their interaction with the environment and their role in the ecosystem.
- Enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects.

DSC-8: Biochemistry: Metabolic Processes (Semester – III)

After completion of the course, a student will be able to:

- Interpret the structure-functional relationships of carbohydrates, proteins, lipids and nucleic acids.
- Understand the clinical knowledge and importance of antioxidants.

- Understand the process of biological oxidation crucial to generation of energy for a living cell.
- Appreciate the action of various types of enzymes under variety of conditions.

DSC-9: Human Physiology- Life Sustaining Systems (Semester – III)

By studying this course, students will be able to:

- Appreciate human physiology and have its enhanced knowledge.
- Recognize and identify principal and physiology of digestion.
- Understand the functions of important physiological systems including the digestive, circulatory, renal and respiratory system.
- Learn an integrative approach to understand how these separate systems interact to yield integrated physiological responses to maintain homeostasis in the body along with feedback mechanisms.
- Amalgamate ideas to make the connection between knowledge of physiology and real-world situations, including healthy lifestyle decisions and problems faced due to homeostatic imbalances.
- Perform, analyze and report on experiments and observations in physiology.
- Know the fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue an advanced degree.

DSC-10: Comparative Anatomy Of Vertebrates (Semester – IV)

By studying this course, students will be able to:

- have a better understanding of the evolutionary significance of comparative anatomy.
- understand the importance of morphology and anatomy of organisms in relation to evolution.
- appreciate the comparative anatomy among vertebrates that provides evolutionary evidences.
- enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects.

DSC-11: Developmental Biology (Semester – IV)

By studying this course, students will be able to:

- Appreciate the events that lead to the formation of a multicellular organism from a single fertilized egg.
- better understand the general patterns and sequential developmental stages during embryogenesis.
- gain knowledge of the general mechanisms involved in morphogenesis. comprehend the processes of ageing to improve the overall health and quality of life in aged people.
- acquire basic knowledge and importance of latest techniques like stem cell therapy, in vitro fertilization and amniocentesis etc.
- develop the skill to raise and maintain culture of model system- *Drosophila* in the laboratory.

DSC-12: Animal Behaviour (Semester – IV)

By studying this course, students will be able to:

- Comprehend various types of animal behaviour and their importance.
- Observe, analyse, interpret and document the different types of behaviour.
- Enhance their skills by taking short projects pertaining to Animal behaviour.
- Appreciate and develop passion to biodiversity; and respect the nature and environment.
- Better understand and relate the fundamentals and advanced concepts so as to develop a strong foundation that will enable them to acquire skills and knowledge.

Discipline Specific Elective Course(s) (DSE) (2nd Year)

DSE-1: Wildlife Conservation & Management (Semester III)

By studying this course, students will be able to:

- Appreciate wildlife in general and realize its conservation and management in particular.
- Better understand the application of the principles of ecology and animal behaviour to formulate strategies for the management of wildlife populations and their habitats.
- Understand the management practices required to achieve a healthy ecosystem for wildlife population along with emphasis on conservation and restoration.
- comprehend the key factors for loss of wildlife and important strategies for their in situ and ex situ conservation.
- recognize the techniques for estimation, remote sensing and Global Position Tracking for wildlife.

- gain knowledge about the wildlife diseases and the quarantine policies.
- know about the Protected Area Networks and Ecotourism in India.
- Perform critical thinking, literature review; scientific writing as well as presentations; and participation in citizen science initiatives with reference to wildlife.

DSE-2: Fish And Fisheries (Semester IV)

By studying this course, students will be able to:

- acquire basic knowledge of physiology and reproduction in fishes.
- analyse different kinds of water and identify/differentiate among various kinds of fishes.
- equip the students with the knowledge on the procedures for artificial and induced breeding which can be learnt by visiting any fish farm or demonstrated in research labs in college/Departments.
- have more knowledge of the in-land and marine Fisheries in India and to explore ways in which it can contribute to the Indian economy.
- know more about the different methods of fishing and fish preservation which can be employed for export and storage of commercial fishes.
- develop skills for entrepreneurship or self-employment in fisheries-related business.

Generic Elective Course(s) (GE) (Common Pool) (2nd Year)

GE-3: Food, Nutrition & Health (Semester III)

By studying this course, students will be able to

- have an in-depth understanding of the dietary sources and role of nutrients informing a balanced diet.
- appreciate the concept of nutritional requirements for different age groups and in pregnancy and lactation.
- know about the various food allergens and the body's hypersensitivity towards it.
- understand the concept of health and role of various nutrients in mitigating several deficiency disorders.
- identify and analyse the causes of malnutrition, lifestyle-related disorders, addiction-related social health problems and eating disorders.

- appreciate the various techniques from identification of adulterants, estimation of essential nutrients in food products, to measurement of vital anthropometric indicators of health, as widely used by practitioners.

GE-4: Insect Vector And Disease (Semester IV)

By studying this course, students will be able to

- identify different insects and classify them based on their morphology and behaviour.
- describe the host-pathogen relationships and the role of the host reservoir on transmission of parasite.
- explain various modes of transmission of parasite by insect vectors.
- recognize various possible modern tools and methodologies for laboratory diagnosis, surveillance and treatment of diseases.
- develop a critical understanding of insect transmitted diseases such as Zoonotic, Vertical and Horizontal transmission, host specificity etc.
- spread awareness on public health programs about insect borne diseases and their control.
- To use advanced management strategies in disease control with respect to parasite evolution

Skill Enhancement Course (SEC) (Common Pool) (2nd Year)

SEC 3: Healthy And Sustainable Food Choices (Semester-III)

After studying this course, the student will be able to:

- Select and prepare healthier food options
- Relate the influence of food environment on food choices
- Comprehend the importance of sustainable food choices

SEC 4: PUBLIC HEALTH HYGIENE AND NUTRITION (Semester-IV)

By the end of the course, the students will be able to:

- get a holistic overview of the inter disciplinary nature of Public health.
- They will be able to understand and address behavioral, social and cultural factors that impact individual and population health disparities.
- understand public health issues in India particularly related to Malnutrition, sanitation issues and related burden of infectious disease, and the role of pollution as a public health concern.

- gets hands-on training on preparation of questionnaire and collection of primary and secondary data relevant to public health issues. They will be trained to use epidemiological methods to analyze patterns of disease progression in a population and describe applications and programs that can help address or mitigate the issue.
- To study various factors deteriorating quality of water by collecting samples from various parts of cities. Check TDS, pH, colour, odour, and transparency of water sample.
- Study of probable causes of stress and mental health problems. Design of some remedial strategies to overcome these problems.
- They will also learn to present the relevant data after subjecting it to statistical analysis.
- They will be able to identify and apply the appropriate statistical method needed to analyze and describe a public health problem.

Value Addition Course(s) (VAC) (Common Pool)

VAC3: YOGA PHILOSOPHY AND PRACTICE (Semester-III)

The Learning Outcomes of the course are:

- Understanding ways to harmonise the body and mind through Yoga.
- Disciplining the mind through practicing Yoga.
- Understanding of consciousness through practical training.

VAC4: YOGA PHILOSOPHY AND PRACTICE (Semester-IV)

The Learning Outcomes of the course are:

- Understanding ways to harmonise the body and mind through Yoga.
- Disciplining the mind through practicing Yoga.
- Understanding of consciousness through practical training.

Core Course(s) 3rd Year

DSC-13: PRINCIPLES OF IMMUNOLOGY (Semester – V)

On successful completion of the course students will be:

- have a better understanding of the concepts of innate and acquired immunity.

- acquire knowledge of the immunogenicity of biomolecules comprehend and analyze the different cellular and humoral components of the immune system
- appreciate the contribution of various components of immune system in health and disease including basis of vaccination, autoimmunity, immunodeficiency and hypersensitivity

DSC-14: CELL AND MOLECULAR BIOLOGY (Semester – V)

After completion of the course, a student will be able to :

- have a better understanding of the diverse cellular processes and cellular interactions.
- have an in-depth knowledge of the defects in cellular functioning and the molecular mechanisms that can lead to various diseases.
- appreciate the importance of homeostasis of the body and the adversities of disturbing it.
- acquire the basic information of cell signalling pathways and to elucidate its roles in gene expression and its regulation in eukaryotes.
- interpret the differences between cellular deaths; stem cells and their applications in therapeutic cloning and regenerative medicine.
- explain post-transcriptional modification mechanisms for the processing of eukaryotic mRNA.
- impart experimental skills used in clinical and research laboratories giving the students an extra edge for taking up higher studies.

DSC-15: FUNDAMENTALS OF GENETICS (Semester – V)

By studying this course, students will be able to

- Enhance knowledge of the basic principles of inheritance.
- Develop analytical skills and critical thinking through pedigree analysis.
- Understand the mechanism of gene transfer and mapping in both prokaryotes and eukaryotes.
- Learn the mechanisms of mutations and harmful and beneficial effects of mutagens, which help evolve new species over time.
- Be able to grasp basic concepts of human chromosomal disorders.

DSC-16: ANIMAL BIOTECHNOLOGY (Semester – VI)

By studying this course, students will be able to:

- Enable students to make a strategy to manipulate genetic structure of an organism for improvement of any trait.
- Comprehend the ethical and social issues regarding GMOs.
- Gain knowledge of DNA isolation, Agarose gel electrophoresis, PCR, transformation etc.
- Execute the application of recombinant DNA technology in designing research project.
- Acquire technical skills required for joining research labs/industry/institute/pharmaceutical etc. including entrepreneurship.

DSC-17: METHODS IN BIOSTATISTICS (Semester – VI)

By studying this course, students will be able toL

- better understand the basic concepts of Biostatistics and its various applications in different fields of biological sciences.
- acquire basic skills to set up hypothesis and design research studies.
- enable students to differentiate among various experimental designs and apply appropriate statistical tests.
- develop the skills to collect and represent data in tabular and graphical forms.
- analyze data and interpret experimental results using calculator, spread sheets software and online/offline software tools.

DSC-18: EVOLUTIONARY BIOLOGY (Semester – VI)

By studying this course, students will be able to:

- gain knowledge about the relationship of the evolution of various species and the environment they live in.
- apply knowledge gained, on populations in real time, while studying speciation, behaviour and susceptibility to diseases.
- better understand the study of variations, genetic drift to ensure that conservation efforts for small threatened populations are focused in right direction.
- predict the practical implication of various evolutionary forces acting on the human population in the field of human health, agriculture and wildlife conservation.
- use various software to generate interest towards the field of bioinformatics and coding used in programming language.

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE-3a: INTEGRATIVE SYSTEMS BIOLOGY AND BIOINFORMATICS (Semester V)

By studying this course, students will be able to:

- know more about the basic of systems biology and bioinformatics
- better understand about the availability of experimental data through biological databases, usage of small molecules, nucleic acids, protein sequences, in a variety of biological sciences domains
- gain more knowledge about the gene sequence annotation, protein structure prediction and gene enrichment prediction
- acquire skills to perform and understand pair-wise and multiple sequence alignment
- better understand a variety of computational tools and approaches, as well as their use in in silico drug discovery, structural bioinformatics, and functional genomics etc.

DSE-3b: REPRODUCTIVE BIOLOGY AND ASSISTED REPRODUCTIVE TECHNOLOGIES (ART) (Semester V)

By studying this course, students will be able to:

- get an in-depth understanding of morphology, anatomy, and histology of male and female reproductive organs.
- know different processes in reproduction starting from germ cell formation to fertilization and consequent pregnancy, parturition, and lactation.
- compare estrous and menstrual cycles and their hormonal regulation.
- comprehend the interplay of various hormones in the functioning and regulation of the male and female reproductive systems.
- know about the diagnosis and management of infertility, including the latest methods, technologies, and infrastructure in assisted reproduction.
- better understand the modern methods of contraception and their use in family planning strategies.
- translate their understanding into the development of products like non-hormonal contraceptives; contribute to drug discovery programs as well as neonatal and maternal health programmes and work with family planning teams to understand the needs and preferences of individuals belonging to lower socioeconomic groups.

DSE-4a: Nanobiotechnology (Semester VI)

By studying this course, students will be able to:

- better understand the basics of nanobiotechnology and the nanoscale paradigm in terms of properties at the nanoscale dimension.
- acquire skills to optimize the synthesis of nanoparticles.
- appreciate the interaction between biomolecules and nanoparticle surfaces and theirapplications.
- analyze the process of nanoparticle internalization inside the cell and to evaluate the process and interactions of nanoparticles within the cells.
- better understand the practical, real world biosensing technologies such as enzyme-based biosensors.
- ability to understand the ethical, societal responsibilities and identify the risk assessments involved in using bio-nanobiomaterials.
- to provide a critical and systematic understanding of cutting-edge technology at the forefront.

DSE-4b: Human Endocrinology (Semester VI)

By studying this course, students will be able to:

- comprehend the endocrine system and properties of hormones.
- understand the importance of endocrine system and its role in maintenance of homeostasis.
- gain in-depth knowledge of the molecular mechanism of hormone action and its regulation.
- better appreciate the regulation of physiological process and its implication in diseases.
- acquire information about human endocrine disorders.

DSE-4c: Toxicology (Semester VI)

By studying this course, students will be able to:

- acquire in-depth knowledge of the principles of toxicology, exposure and doseresponse assessment.
- use technical and analytical skills to quantify the level and effect of xenobiotics environment.
- better understand the mechanism of action and effects of toxic chemicals at multiple levels of biological organization.
- identify relationship between chemical exposure and its effect on physiological system.

- perform, analyse and interpret technical aspects and experimental approaches for toxicological research testing and risk assessment.

DSE-4d: Research Methodology (Semester VI)

NA

Generic Elective Course(s) (GE) (Common Pool) 3rd Year

GE-5: CONCEPT OF ANIMAL BEHAVIOUR (Semester V)

By studying this course, students will be able to

- better understand the various types of animal behaviour and their importance.
- enhance their observation skills, analytical skills, scientific interpretation and documentation skills.
- enable students to evaluate the characteristic features of animal life including static postures, active movements, noises, smells, changes in colour and shape.
- realise, appreciate and develop passion to biodiversity and respect the nature and its surroundings.

GE-6a: MODEL ORGANISMS IN RESEARCH (Semester VI)

By studying this course, students will be able to:

- better understand the concept of model organisms and their advantages.
- appreciate various types of model organisms used in biological research.
- gain better knowledge of how the model organisms can be used for modelling of human diseases.
- have an insight on the ethical issues related to handling and maintaining laboratory animals and plants.
- design simple experiments with model organism.
- determine the type of model organisms that are suitable to answer the specific research questions.

GE-6b: NANOBIOLOGY (Semester VI)

By studying this course, students will be able to:

- better understand the interaction of biomolecules with surfaces of different chemical and physical species.
- appreciate the different applications of various types of nanostructured materials.

- gain knowledge of the types of nanoparticles based on size, shape, surface properties and composition.
- interpret/ analyse and get insight into the applications in the field of medicine.
- use basic principles of microfluidics to solve biotechnical and bioanalytical problems.
- appreciate the multidisciplinary nature of Nanobiology.
- develop skills in high-tech instrumental techniques suited for characterization of the micro/nano- structural properties.

GE-6c : FORENSIC BIOLOGY (Semester VI)

By studying this course, students will be able to:

- Comprehend the fundamentals of forensic biology and DNA analysis.
- better understand the concepts of proper collection and preservation of biological.
- exhibits and crime scene investigation of biological evidence.
- rationalize the significance of criminal profiling.
- Develop skills based on the practical techniques of biological principles that includes sample recovery, sample handling, different analytical techniques and DNA profile comparison.

Skill Enhancement Course (SEC) (Common Pool) 3rd Year

SEC 5: YOGA IN PRACTICE (Semester-V)

By studying this course, students will be able to:

- form an understanding of the concept of yoga.
- learn various aspects of the science of yoga.
- Gain theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

SEC 6: YOGA IN PRACTICE (Semester-V)

By studying this course, students will be able to:

- form an understanding of the concept of yoga.
- learn various aspects of the science of yoga.
- Gain theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

SRI VENKATESWARA COLLEGE
(University of Delhi)

Program Learning Outcomes (POs), Program Specific Outcomes (PSOs) & Course Outcomes (COs) of UG Courses under NEP-UGCF, 2022 for 1st to 6th Semester

1. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) (ALL COMBINATIONS)

1. Tamil+Political Science/History
2. Telugu+Political Science/History
3. Hindi+History/Sociology
4. Sanskrit+Sociology/History
5. English+Sociology/Economics
6. History+Political Science
7. Economics+ Mathematics/Statistics/Sociology

I. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) ECONOMICS

DEPARTMENT: ECONOMICS

Core Course(s) (2nd Year)

DSC-5 (Major & Minor): INTERMEDIATE MICROECONOMICS I: Behavioural Foundations of market interactions (Semester – III)

On successful completion of the course students will be able to:

- Be able to formally analyse the behaviour of individual agents like consumers and producers under certain conditions
- The student will be able to use mathematical tools to facilitate the understanding of the basic concepts.
- This course will look at the behaviour of the consumer and the choices of the competitive firm
- Students will learn the basic elements of consumption and production theories using various technical frameworks.
- This course also provides them the behavioural foundations of market supply and demand.

DSC-6 (Major) : Optimization Methods for Economic Analysis (Semester – III)

On successful completion of the course students will be:

- The students will be able to solve optimal solution and policy impacts using comparative- static analysis and statistic optimisation techniques.
- This offers the mathematical foundations necessary for further study of a variety of disciplines including postgraduate economics, statistics, computer science, finance and data analytic.
- The analytical tools introduced in this course will help them to apply optimization techniques used in business decision-making for managers, entrepreneurs and policy makers alike.

Core Course(s) (3rd Year)

DSC-9 (Major): Intermediate Microeconomics II: Market, Government and Welfare (Semester – V)

On successful completion of the course students will be:

- to analyse the complexity of multi-commodity markets.
- The efficiency results, known as welfare theorems, are central to understanding of market economy.
- The course also discusses inefficiencies coming from market concentration and externalities.
- It further would discuss the role of government to deal with the inefficiencies and resultant welfare outcomes.
- This course helps the students to understand the efficiency of markets and the environment where the standard market mechanism fails to generate the desirable outcomes in simple general equilibrium settings.
- The issues of market imperfection and market failures lead students to the economics of policy design. The students will learn the efficacy of government interventions for improved welfare.

DSC-10 (Minor): Introductory Development Economics (Semester – V)

On successful completion of the course students will be able to understand:

- basic concepts of growth, alternative conceptions of development, and factors affecting development
- measures of poverty and inequality and interconnections between growth and inequality

- the role of the state in economic development and issues relating to state governance

Discipline Specific Elective Course(s) (3rd Year)

DSE-3: Fiscal Policy and Public Finance in India (Semester – V)

On successful completion of the course students will be:

- The students would learn the needs and objectives of government expenditure on social and environmental schemes and critically evaluate them.
- The students will understand the new concepts of budgeting and analyse the fiscal and debt management policies of the government through an environmental perspective.
- They will also learn the vast mechanism of fiscal federalism in India and the role and contribution of the Finance Commission in achieving equity and efficiency in resource allocation at multiple levels of government

II. COURSE: B.A. B.A. (MULTIDISCIPLINARY STUDIES) HINDI

DEPARTMENT: HINDI

Program Outcomes

PO1: हिंदी भाषा और साहित्य का परिचय

PO2: प्रमुख साहित्यकारों का अध्ययन

PO3: हिंदी भाषा के विकास और साहित्य के इतिहास की स्पष्ट समझ विकसित करना ।

PO4: हिंदी साहित्य और भाषा के विकास की स्पष्ट समझ विकसित होगी

PO5: विशिष्ट कविताओं के अध्ययन से साहित्य की समझ विकसित होगी ।

Course Outcomes: B.A. (Prog.) Hindi (NEP UGCF 2022)

Core Course(s)

हिंदी क(12वीं कक्षा तक हिंदी पढ़ी है)

पेपर नाम - हिंदी भाषा और साहित्य का उद्भव और विकास

Course objective

1.हिंदी भाषा में रुचि विभाजित करना

2. हिंदी साहित्य एवं प्रमुख साहित्यकारों का परिचय

3. हिंदी भाषा को समझना और उसके आधुनिक प्रयोग को जानना

हिंदी ख(10 वीं कक्षा तक हिंदी पढ़ी है)

हिंदी भाषा और साहित्य उदभव और विकास

course objective

1. *हिंदी भाषा और साहित्य के इतिहास की समझ विकसित होगी*

2. *प्रमुख कविताओं की आलोचनात्मक समझ विकसित होगी*

हिंदी ग (8 वीं कक्षा तक हिंदी पढ़ी है)

पेपर - हिंदी भाषा और साहित्य का उद्भव और विकास

Course objective

1. *हिंदी भाषा और साहित्य की सामान्य जानकारी विकसित करना*

2. *राष्ट्रभाषा, राजभाषा और संपर्क भाषा के रूप में हिंदी की स्थिति का परिचय देना*

3. *विशिष्ट कविताओं के अध्ययन- विश्लेषण के माध्यम से कविता - संबंधी समझ विकसित करना।*

Generic Elective (GE) (Common Pool)

Refer to Common Pool under Hons. course.

बी. कॉम (प्रोग्राम) पाठ्यक्रम

हिंदी क(12वीं कक्षा तक हिंदी पढ़ी है)

पेपर नाम - हिंदी भाषा और साहित्य का उद्भव और विकास

Course objective

1.हिंदी भाषा में रुचि विभाजित करना

2. हिंदी साहित्य एवं प्रमुख साहित्यकारों का परिचय

3. हिंदी भाषा को समझना और उसके आधुनिक प्रयोग को जानना

Course learning outcomes

1. *हिंदी भाषा और साहित्य का परिचय*

2. *प्रमुख साहित्यकारों का अध्ययन*

हिंदी ख(10 वीं कक्षा तक हिंदी पढ़ी है)

हिंदी भाषा और साहित्य उदभव और विकास

Course objective

1. *हिंदी भाषा और साहित्य के इतिहास की समझ विकसित होगी*

2. *प्रमुख कविताओं की आलोचनात्मक समझ विकसित होगी*

Course learning outcomes

हिंदी भाषा के विकास और साहित्य के इतिहास की स्पष्ट समझ विकसित करना ।

हिंदी ग (8 वीं कक्षा तक हिंदी पढ़ी है)

पेपर - हिंदी भाषा और साहित्य का उद्भव और विकास

Course objective

1. *हिंदी भाषा और साहित्य की सामान्य जानकारी विकसित करना*

2. *राष्ट्रभाषा, राजभाषा और संपर्क भाषा के रूप में हिंदी की स्थिति का परिचय देना*

3. *विशिष्ट कविताओं के अध्ययन- विश्लेषण के माध्यम से कविता - संबंधी समझ विकसित करना।*

Course Learning outcomes

1. *हिंदी साहित्य और भाषा के विकास की स्पष्ट समझ विकसित होगी*

2. *विशिष्ट कविताओं के अध्ययन से साहित्य की समझ विकसित होगी ।*

III. COURSE: B.A. (MULTIDISCIPLINARY STUDIES)

DEPARTMENT: HISTORY

Program Outcomes

The History curriculum is based on the following programme outcomes:

PO1: The objective of this curriculum is to prepare the students for the society at large.

PO2: This curriculum of B.A History Program offers students access to cutting edge scholarship organised in a pedagogical form that is accessible and interesting.

PO3: It provides the students with an opportunity to critically analyse the historical processes which have an interminable influence on our society at large.

PO4: It gives requisite information about different aspects of the past to students, to teach them how to deconstruct this information, how to undertake research, frame an argument and debate, a process that has immense significance. The expected outcome is to make students understand the interconnectedness of our present with the past. It provides a mechanism through which students, by acquiring knowledge about the past, also learn the skills to understand the present better.

PO5: On completion of the course students are expected to have acquired the skills of critical thinking, rational enquiry, effective communication, and exploring the relationship between past, present and historiography.

PO6: To acquire knowledge of multiple perspectives through which significant developments in the history of the Indian subcontinent from earliest times up to the period after independence.

PO7: To familiarize them with the significant patterns of development in certain parts of the modern and early modern world as well as certain non-Indian ancient societies.

PO8: To enable them to carefully read a complex historical narrative, evaluate its deployment of evidence, and understand its argument as well as critically analyse the same.

PO9: To be able to identify patterns of change and continuity with regards to issues of contemporary significance over long durations as well as across diverse geo-cultural zones.

PO10: Greater ability to distinguish between a historical phenomenon -- that is time-place-context driven, hence changeable and challengeable -- from that which is not.

PO11: Sensitivity to gender and social inequities as well as acquaintance with the historical trajectories of these issues.

PO12: Greater respect for basic human values and ideals of equality, freedom, respect for diversity, and other constitutional values.

PO13: Skill of picking up disparate sets of information from varied sources and weaving them into a coherent argument with a view to reveal identifiable patterns of development.

PO14: Capability to assume leadership roles and apply the above mentioned analytical ability in various other non-familiar contexts.

PO15: Possess knowledge of the values and beliefs of multiple cultures so as to effectively engage in a multi-cultural society and interact with diverse groups.

Course Outcomes: B.A. (Prog.) History (NEP UGCF 2022)

Core Course(s) (1st Year)

Discipline Specific Core Course (DSC – 01): History of India from Earliest Times up to c. 300 CE (Semester-I)

CO1:Explain the significance of the varied sources for studying pre- and proto-history

CO2:Distinguish between culture and civilisation (with specific reference to the Indus-Saraswathi/ Harappan Civilisation)

CO3: Locate cultural, economic, material, and political developments and transformations leading to in early societies urbanisation and then state formation

CO4: Highlight factors leading to the rise of heterodox sects

CO5: Trace the shift of historical focus from the North-West of India to the Gangetic belt (Mauryan Empire) and later to newer areas (Tamilakkam, Post- Mauryan Polities, economies, societies and cultures), while appreciating the process of assimilation.

Discipline Specific Core Course (DSC – 02): History of India, c. 300 CE to 1200 CE (Semester II)

CO1: Develop a better understanding of the importance and interpretations of both literary and archaeological sources related to the period of study

CO2: Identify the significant changes from late historic centuries to the early medieval times that influence the following centuries

CO3: Analyse the ever-fluid political scenario in terms of their spatial context and chronological framework

CO4: Delineate transformations in state formation, administrative framework, social structure, economy and cultural life, with special focus on regional polities

CO5: Contextualize the evolution and growth of regional styles of temple architecture and their role as a hub of socio-economic and political activities.

Core Course(s) 2nd Year

DSC-1: HISTORY OF INDIA 1200-1550 (Semester – III) (Major & Minor)

On successful completion of the course students will be:

- Identify the major political developments in the history of India during the period between the thirteenth and the first half of the sixteenth century.

- Outline the changes and continuities in the field of culture, especially with regard to art, architecture, Bhakti movement and Sufi movement.
- Discuss the economic history of the period under study in India especially, where agrarian production and its implications are concerned.
- Delineate the development of trade and urban complexes during this period.

DSC-2: CULTURAL TRANSFORMATIONS IN EARLY MODERN EUROPE-I (Semester – III) (Major)

On successful completion of the course students will be:

- Understand the different perspectives of cultural developments in Europe.
- Explain the Renaissance in the realm of art, literature, science and philosophy and the processes by which major transformation unfloded in European society and culture.
- Trace the upheaval in religion in the form of Protestant Reformation and Counter reformation.
- Identify the material, social and cultural aspects after the conquest of the New World.

DSC-1: HISTORY OF INDIA 1550-1700 (Semester – IV) (Major & Minor)

After the successful completion of this Course, the students will be able to:

- Identify the major political developments in the history of India during the period betweenthe sixteenth century and between the beginning of the eighteenth century.
- Outline the changes and continuities in the field of culture, especially with regard to art,architecture and Sufi movement.
- Discuss the economic history of the period under study in India especially, where agrarianproduction and its implications are concerned.
- Delineate the development of trade and urban complexes during this period.

DSC-2: CULTURAL TRANSFORMATIONS IN EARLY MODERN EUROPE-II (Semester – IV) (Major)

After completing this course, students will be able to:

- Understand the different perspectives of Cultural and Scientific developments in Europe.
- Explain the impact of Renaissance in the realm of art, literature, science and philosophy and the processes by which major transformation unfolded in European society and culture.

- Trace the developments in Literacy and artistic field.
- Identify the social and cultural aspects after the transitions in popular culture and mentalities.

Core Course(s) (3rd Year)

DSC-1: HISTORY OF INDIA 1700 – 1857 (Semester – V) (Major & Minor)

On completion of this course the student shall be able to:

- Explain the process of the establishment of Company rule and the policies and practises to sustain the process of expansion and consolidation of the Company rule.
- Understand the impact of various economic policies and how they contributed to dissatisfaction with colonial rule.
- Evaluate the reform measures implemented during under the colonial rule and how they served the interests of the Empire, particularly in the context of education.

DSC-2: HISTORY OF EUROPE: 1789-1870 (Semester – V) (Major)

On successful completion of the course students will be:

- Trace the key repercussions of the French revolution and Empire-building by France.
- Distinguish the patterns of industrialization in Europe and assess the widespread impact of the industrial revolution.
- Highlight the growth of labour movements and new ideologies in the industrial era.
- Comprehend the broad varieties of nationalist aspirations that emerged in the nineteenth century, and the processes by which new nation-states were carved out in Italy and Germany.

DSC-1: HISTORY OF INDIA 1858 – 1947 (Semester – VI) (Major & Minor)

On completion of this course the student shall be able to:

- Examine various reform movements as well as issues such as gender and caste.
- Understand how the socio-political and economic experiences of the people of India under colonial rule provided a context for the emergence of a powerful anti-colonial nationalist movement in India.
- Analyse the complexities of communal politics that resulted in Partition and Independence.

DSC-2: HISTORY OF EUROPE: 1870-1945 (Semester – VI) (Major)

Upon completion of this course the student shall be able to:

- Deliberate on the meaning of imperialism and the manifestations of imperialist rivalry and expansion in the 19th and early 20th century.
- Distinguish the varied impacts of the First World War as well as the outbreak of a revolution in the Russian Empire during the War.
- Analyse the conflict between radical and conservative forces, and the gradual consolidation of ultra-nationalist and authoritarian regimes in Europe between the World Wars.
- Delineate the reasons for the outbreak of the Second World War, and the course of the War.
- Analyse the key, immediate repercussions of the Second World War

Discipline Specific Elective Course(s) 3rd Year

DSE-3: PREHISTORY AND PROTOHISTORY OF INDIA (Semester – V)

On successful completion of the course students will be able to:

- Have the ability to differentiate between various pre and proto historic cultures/periods.
- Explain the changes and continuity in distribution, tool technology and subsist-ence practices during the Palaeolithic and Mesolithic periods.
- Identify the characteristic features of Neolithic cultures in the Indian subcontinent with their regional distribution
- Analyse the various copper using cultures of India.
- Distinguish the different phases of Harappan civilization.
- Locate the development of Iron technology in different geographical zones of India.

DSE-4: ART, SOCIETY AND CULTURE IN INDIA c. 300 BCE to 1000 CE(Semester – VI)

On successful completion of the course students will be able to:

- Grasp various dimensions of visual medium of art, architecture, sculpture and paintings, as a primary source of history, which will enable them to develop a deep understanding of the theme.
- Comprehend the different perspectives that explain the emergence and crystallization of various social structures – varna, jati, untouchability and also gender relations.
- Understand that the society displayed flexibility in terms of assimilation, mobility, providing corresponding spaces to new entrants.

- Grasp the essentials of the major religious traditions of the given time period.
- Develop an understanding about the cultural florescence as reflected in rich literature produced in Sanskrit and vernacular languages.

IV. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) MATHEMATICS

DEPARTMENT: MATHEMATICS

Program Outcomes

Course Outcomes: B.A (Prog.) Mathematics as Major (NEP UGCF-2022)

Core Course(s) (1st Year)

DSC 1: ELEMENTS OF DISCRETE MATHEMATIC (I)

This course will enable the students to:

- Understand the basic concepts of sets, relations, functions, and induction.
- Understand mathematical logic and logical operations to various fields.
- Understand the notion of order and maps between partially ordered sets.
- Minimize a Boolean polynomial and apply Boolean algebra techniques to decode switching circuits

DSC 2: TOPICS IN CALCULUS (I)

This course will enable the students to:

- Understand continuity and differentiability in terms of limits and graphs of certain functions.
- Describe asymptotic behaviour in terms of limits involving infinity.
- Use of derivatives to explore the behaviour of a given function locating and classify its extrema and graphing the function.
- Apply the concepts of asymptotes, and inflexion points in tracing of cartesian curves.
- Compute the reduction formulae of standard transcendental functions with applications

DSC 2: ANALYTIC GEOMETRY (II)

This course will enable the students to:

- Learn concepts in two-dimensional geometry.
- Identify and sketch conics namely, ellipse, parabola and hyperbola.
- Learn about three-dimensional objects such as straight lines and planes using vectors, spheres, cones and cylinders

DSC 2 (Discipline A-2): ELEMENTARY LINEAR ALGEBRA (II)

This course will enable the students to:

- Visualize the space R^n in terms of vectors and the interrelation of vectors with

matrices.
- Familiarize with concepts of bases, dimension and minimal spanning sets in vector spaces.
- Learn about linear transformation and its corresponding matrix

Course Outcomes: B.A (Prog.) Mathematics as Non-Major (NEP UGCF-2022)

DSC : TOPICS IN CALCULUS (I)

This course will enable the students to:

- Understand continuity and differentiability in terms of limits and graphs of certain functions.
- Describe asymptotic behaviour in terms of limits involving infinity.
- Use of derivatives to explore the behaviour of a given function locating and classify its extrema and graphing the function.
- Apply the concepts of asymptotes, and inflexion points in tracing of cartesian curves.
- Compute the reduction formulae of standard transcendental functions with applications

DSC 2 (Discipline A-2): ELEMENTARY LINEAR ALGEBRA (II)

This course will enable the students to:

- Visualize the space R^n in terms of vectors and the interrelation of vectors with matrices.
- Familiarize with concepts of bases, dimension and minimal spanning sets in vector spaces.
- Learn about linear transformation and its corresponding matrix.

Core Course(s) 2nd Year

DSC-3: DIFFERENTIAL EQUATIONS (Semester – III)

On successful completion of the course students will be:

- Solve the exact, linear, Bernoulli equations, find orthogonal trajectories and solve rate problems.
- Apply the method of undetermined coefficients and variation of parameters to solve linear differential equations.
- Solve Cauchy-Euler equations and System of linear differential equations.
- Formulate and solve various types of first and second order partial differential equations.

DSC-4: ABSTRACT ALGEBRA (Semester – IV)

On successful completion of the course students will be:

- Appreciate ample types of groups present around us which explains our surrounding better, and classify them as abelian, cyclic and permutation groups.

- Explain the significance of the notion of cosets, normal subgroups and homomorphisms.
- Understand the fundamental concepts of rings, subrings, fields, ideals, and factor rings.

Core Course(s) 3rd Year

DSC-5: ELEMENTS OF REAL ANALYSIS (Semester – V)

On successful completion of the course students will be:

- Understand the basic properties of the set of real numbers, including completeness and Archimedean with some consequences.
- Recognize bounded, convergent, monotonic and Cauchy sequences
- Learn to apply various tests such aslimit comparison, ratio, root, and alternating series tests for convergence and absolute convergence of infinite series of real numbers.

DSC-6: PROBABILITY AND STATISTICS (Semester – VI)

On successful completion of the course students will be:

- Understand some basic concepts and terminology-population, sample, descriptive and inferential statistics including stem-and-leaf plots, dotplots, histograms and boxplots.
- Learn about probability density functions and various univariate distributions such as binomial, hypergeometric, negative binomial, Poisson, normal, exponential, and lognormal.
- Understand the remarkable fact that the empirical frequencies of so many natural populations, exhibit bell-shaped (i.e., normal) curves, using the Central Limit Theorem.
- Measure the scale of association between two variables, and to establish a formulation helping to predict one variable in terms of the other, i.e., correlation and linear regression

V. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) POLITICAL SCIENCE

DEPARTMENT: POLITICAL SCIENCE

Program Outcomes

Course Outcomes: B.A. (Prog.) Political Science (NEP UGCF 2022)

Core Course(s) (1st Year)

Discipline-Specific Core Course (DSC-1): Introduction to Political Theory (Sem-I)

After completing this course students will be able to:

- Understand the nature, scope, and relevance of political theory

- Understand the different concepts of political theory such as liberty, equality justice, rights, and fraternity
- Develop a broader historical, normative, and empirical understanding of political theory
- Know and understand ancient Greece and ancient Indian political theory
- Reflect upon the contemporary debates in political theory

Discipline Specific Core Course – 2 (DSC-2): Public Administration in India (Sem-I)

After completion of this course, students will be able to:

- Have a clear picture of the complex institutional structure of Indian administration at present
- Understand the building blocks of local governance, in rural and urban areas
- Explain the processes by which different budgeting systems work for this structure
- Analyse the processes of implementation of different social welfare policies by the administrative institutions.

Discipline Specific Core Course (DSC-2A): Indian Government and Politics (Sem-II)

On successful completion of the course, students would demonstrate:

- Understanding of the Indian Constitution, its basic features and the rights and duties of the citizens as well as the constitutional obligations of the state
- Knowledge of state institutions in India, the constitutional provisions governing them and actual their working
- Understanding into the nature of Indian society and its relationship with politics through the prism of caste, class, gender, religion, etc.
- Knowledge of party system and political parties in India
- Awareness of the development debates in India and its relationship with the social movements

Discipline Specific Core Course (DSC-2B): India's Foreign Policy (Sem-II)

At the end of this course, the students would acquire:

- Basic knowledge of the determinants, principles and key drivers of India's foreign policy.

- Understanding the original rationale of India's non-alignment policy and its relevance in the contemporary context as to how India exercises strategic autonomy in foreign policy choices.
- An insight about India's position in changing global power equations particularly its bilateral ties with powerful nations like the US and Russia along with India's largest neighbour, China.
- Understanding of India's neighbourhood diplomacy in South Asia with regard to important challenges pertaining to border disputes, migration and refuges
- Grasp of India's negotiation strategies in dealing with global challenges in the realm of trade and environmental governance.

Core Course(s) (2nd Year)

DSC-3A: ANCIENT AND MEDIEVAL INDIAN POLITICAL THOUGHT (Semester III)

After reading the course the students would be able to answer

- What were the major institutions of government in ancient India and how did they function?
- How thinkers like Manu, Shukra, Brihaspati and Kautilya perceived the role of statecraft in society?
- What was the Nitisar tradition? How did it mark a difference from the Arthashastra tradition?
- The students will be able to answer how Kabir epitomised the syncretic traditions of India.
- What was the political and economic ideas of Tiruvallur and what was his take on ethics?

DSC-3B: THEORY AND PRACTICE OF DEMOCRACY (Semester III)

After completing this course students will be able to:

- Develop a broad historical, normative and empirical understanding of the idea and practice of democracy.
- Distinguish different models of democracy and their normative assumptions
- Understand different theories of democracy and how different theories led to waves of democratization over history.
- Understand/assess some of the major political challenges that democracy faces in the wake of globalization.
- Examine current problems and understand how different democratic crises have emerged in practice
- Apply democratic theories to critically assess political institutions and practices

- Engage in dialogue about the meaning and value of democracy
- Explain and defend how democratic theory might be used to respond to problems being faced by nation-states

DSC-4A: COMPARATIVE GOVERNMENT AND POLITICS (Semester IV)

On successful completion of the course, students would demonstrate:

- An in-depth understanding of nature and scope of comparative politics.
- Knowledge of regime forms as distinct from classification of political systems
- Knowledge of various kinds of electoral systems and party systems across countries
- An understanding of the manner in which power exists in society
- Analytical capacity to engage with contemporary debates on welfare, populism, and authoritarianism.

DSC-4B: PUBLIC INSTITUTIONS IN INDIA (Semester IV)

After completing this course, students will

- understand the design and performance of specific institutions
- become aware of the historical contexts in which institutions emerge
- develop the tools to understand the challenges faced by contemporary institutions
- acquire an understanding of what enhances institutional capacity of states

Discipline Specific Elective Course(s) 2nd Year

DSE– 1a: STATE POLITICS IN INDIA (Semester III)

On successful completion of the course, the students would demonstrate:

- Knowledge of the historical context and legal framework of the emergence of state politics in India.
- Understanding of the phenomenon of state formation and reorganisation as part of both national and regional politics in India
- Awareness of the nature of agrarian politics in India and the political economy of states in India
- Knowledge of electoral politics and political leadership in states in India.

DSE – 1b: INDIAN CONSTITUTION: KEY DEBATES (Semester III)

On successful completion of the course, the students will demonstrate:

- Knowledge of the process of constitution making and familiarity with Constituent Assembly debates
- An understanding of the framing of debates in the Constituent Assembly and the forms in which they have remained significant
- An understating of the principles that undergirded the debates and the constitutional values that they sought to entrench

DSE – 2a: GANDHI AND THE CONTEMPORARY WORLD (Semester IV)

After reading this module the student will be able to answer:

- What are the core principles of Gandhian thought on which he scrutinizes all actions?
- How Gandhi applied those principles in shaping his positions on social, political, economic and religious questions?
- The students will be able to answer how Gandhi presented the critique of the Western Civilization.
- The students will be able to know the position of Gandhi on key questions of contemporary debates in India like Religious conversion, protection of cow, language issue and Hinduism.
- The student will be able to know how Gandhi's use of the term Swadeshi does not just limit to economic aspects but all gametes of national life.

DSE – 2b: INDIA'S NATIONAL SECURITY: MAJOR CHALLENGES AND STRATEGIC THINKING (Semester IV)

At the end of the course, students would acquire the ability to:

- Understand the ways in which, the security threats to India have evolved historically and how have these been met.
- Appreciate the intellectual and historical foundations of Indian strategic thinking.
- Develop a nuanced understanding of India's strategic culture.
- Learn about India's internal and external security threats in its multifarious dimensions.
- Understand how India has evolved a whole array of strategic responses such as nonalignment, forging strategic partnerships and bilateral as well as multilateral partnerships to address diverse challenges it faces.

Core Course (s) 3rd Year

DSC-5A: INTRODUCTION TO INTERNATIONAL RELATIONS (Semester V)

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

- Understand the ways in which IR as a discipline evolved from a Eurocentric vantage point to the emergence of a critical movement to shape a more inclusive, historical and a global IR.
- Appreciate the ways in which scholarship from postcolonial countries such as India contribute to understanding the world around us.
- Analyse key concepts and concerns of IR such as war and peace, state, sovereignty and human rights to understand how these forces shape the world towards more efficient global governance.
- Develop critical understandings of power hierarchies and unequal relationships through the lens of feminism and Marxism.
- Understand the important aspects of Non-Western IR that can help students investigate and shape the future course of the discipline.
- Develop a basic understanding of the Indian contributions to the discipline of international relations.

DSC-5B: MODERN INDIAN POLITICAL THOUGHT (Semester V)

After reading this course, the students will be able to:

- Develop critical understanding about modern Indian thought.
- Thematically explore ideas in order to locate the topical debates on important subjects on a historical trajectory
- Reflect over the diverse possibilities exhibited in the writings of the respective thinkers.
- Think about issues and debates in contemporary India from multiple vantage points including its historical significance in the Indian tradition.
- Develop toleration and respect for diverse opinion and at the same time, to admire and appreciate the plurality within the modern Indian intellectual tradition.

DSC-6A: PERSPECTIVES ON PUBLIC ADMINISTRATION (Semester VI)

On completion of this course, the student can be expected to

- have a comprehensive understanding of the conceptual roots of the discipline of Public Administration
- understand how theorising is done in this discipline
- how new perspectives like that of gender influence the orientation of both theory and practice in the discipline.

DSC-6B: COMPARATIVE POLITICAL SYSTEMS (Semester VI)

This paper will provide students with a comprehensive understanding of a range of political systems from different continents in a historical context. The students will engage in studying different countries in detail with reference to their political tradition and state formation, constitution and division of power, political parties and elections, political economy and contemporary challenges. The critical analysis of different political systems will delineate the institutional structures, processes and their functioning in these systems. The course content would also help students develop analytical skills to understand not just the similarities and differences but the uniqueness of some cases as well that highlight how the matrix of diverse determinants and variables result in different discourses in different countries.

Discipline Specific Elective Course(s) 3rd Year

DSE – 3a: INTERNATIONAL POLITICAL ECONOMY (Semester V)

By the completion of the course the students would be able to:

- Develop a basic understanding of the structural functional linkages that connect the realms of politics and economics.
- Learn to use the conceptual tools and theoretical frameworks for understanding the nature and basic functioning of the international political economy.
- Understand the structural drivers that determine the contours of international trade and finance.
- Develop an understanding about the Global South's contribution to this field both in the domain of ideas and working of the global political economy.
- Understand how our economic life is getting transformed on account of the information and communication technology, the cyber economy and interventions of the global civil society**.**

DSE – 3b: UNDERSTANDING AMBEDKAR (Semester V)

The course is designed to provide students the original writings and ideas of Ambedkar on diverse issues beyond caste and equip them to critically engage with the ideas, interpretations. By engaging with the original sources as well as secondary writings on Ambedkar's ideas that cover, caste, class, gender, religion, state, democracy and constitution the students will be able to understand a thinker in the context and contemporaneity. At the end of the course, students shall be equipped with the method of understanding the ideas, philosophy and relevance of a particular thinker. Students shall also be able to reflect on the method of the thinker's

engagement with the then context, issues and concepts. Finally, the students shall be equipped in understanding the conceptual and philosophical diversity, situatedness and significance of Ambedkar beyond his contribution in the sphere of social justice and drafting the Indian constitution. The course thus provides an opportunity to the students to understand Ambedkar for his several important contributions in the field of religion, state, democracy, gender, economy and history.

DSE – 4a: GENDER IN INTERNATIONAL RELATIONS: THEORIES, CONCEPTS AND PRACTICES (Semester VI)

After completing this course, students would be able to:

- understand the issues of IR from a feminist perspective.
- hone their critical thinking skills by developing the ability to interpret, analyse, and assess international issues from this perspective.
- develop their research and writing skills to explore uncharted terrains in IR from a feminist perspective.

DSE – 4b: UNDERSTANDING SAVARKAR (Semester VI)

At the end of the course:

- The students will be able to understand his role and contribution in the freedom movement.
- They will be able to contextualise his thoughts on Hindutva and differentiate it from Hinduism.
- Students will be able to answer what impact religious conversion has on the cultural and political geography of a nation.
- They will be able to understand how he differed from Ambedkar on caste and untouchability questions and what was his response to this important question.

DSE – 11: RESEARCH METHODS IN POLITICS (Semester VI)

On successful completion of the course, students would demonstrate:

- Preliminary training in basic elements of social science research
- Familiarity with how to conceptualize a research problem
- Familiarity with diverse methodologies used in the study of politics
- Skills to identify and understand the use of specific methodologies in a text

VI. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) SANSKRIT

DEPARTMENT: SANSKRIT

Program Outcomes

Course Outcomes: B.A. (Prog.) Sanskrit (NEP UGCF 2022)

Core Course(s) (1st Year)

i. Major:

a. DSC 1: Sanskrit Grammar

- Students will understand the basic structural nuances of Panini's grammar.
- They will become familiar with fundamental samadhi and compounding patterns.
- They will also understand some most important primary and secondary suffixes of Sanskrit.
- The practice of the application of the rules learnt from the reading of the texts will further enhance their knowledge of the structural patterns of Sanskrit language.

b. DSC 2: Sanskrit Poetry

- This course will help the students develop a fair idea of the works of great Sanskrit poets.
- They will be able to appreciate the styles and thoughts of individual poets focusing on the poetical, artistic, cultural and historical aspects of their works.
- This course will enhance competence in chaste classical Sanskrit and give them skills in translation and interpretation of poetic works.

ii. Minor:

a. DSC 1: Sanskrit Grammar

- Students will understand the basic structural nuances of Panini's grammar.
- They will become familiar with fundamental samadhi and compounding patterns.
- They will also understand some most important primary and secondary suffixes of Sanskrit.
- The practice of the application of the rules learnt from the reading of the texts will further enhance their knowledge of the structural patterns of Sanskrit language.

i. Major:

a. DSC-3: Sanskrit Prose

- The course will enable students enable students to familiarize themselves with some

leading classical prose works and individual literary styles of their authors.

● After the completion of this course the learner will be exposed to the socio-cultural conditions of the Indian society as reflected in the prescribed texts.

● Course will also help students to develop their level of Sanskrit language comprehension.

b. DSC - 4: Sanskrit Drama

● After completion of this course the students will be aware about the beauty and richness of classical Sanskrit dramatic tradition.

● This course will enhance the ability for critical thinking on issues of culture, polity, morality, religion etc as reflected in the prescribed texts.

● The course will make the students aware of the formal structures of Sanskrit drama in

the tradition of Bharata's natya Shastra.

ii. Minor:

a. DSC - 2: Sanskrit Prose

● The course will enable students enable students to familiarize themselves with some leading classical prose works and individual literary styles of their authors.

● After the completion of this course the learner will be exposed to the socio-cultural conditions of the Indian society as reflected in the prescribed texts.

● Course will also help students to develop their level of Sanskrit language comprehension.

Core Course(s) (2nd Year)

DSC-5: Sanskrit Theatre (Semester III)

- After the completion of this course, Students will be able to understand various theoretical facets of theatrical production and performance.
- They will learn about the various kinds of theaters, including their layout and décor, acting, costume and makeup departments, etc.
- students learn about the fundamentals of theater performance.

Discipline Specific Elective Course(s) 2nd Year

DSE-6: Art of Balanced Living (Semester III)

- After completing this course, students will have a thorough understanding of the numerous ideas, elements, and problems raised by Sanskrit philosophical and religious literature.

- aims to force students to work on human resource management so they can be more productive and effective in day-to-day situations.

Core Course(s) (3rd Year)

DSC-5 Indian Epigraphy & Paleography (Semester V)

- The contents of this course are related to the formation of the history of ancient India, so it is an interdisciplinary course within Sanskrit.
- Students of Sanskrit can understand how important a role Sanskrit-based inscriptions play in preparing history, and their knowledge of the language can help historians make a perfect history.
- Similarly, students of History will find themselves on the positive ground and directly in touch with material related to the history of ancient India.

Discipline Specific Elective Course(s) 2nd Year

DSE-11: Phonetics in Sanskrit Tradition

- After completing this course the students will learn the basics of Sanskrit Phonetics.
- They will get acquainted with the sound systems and the speech production mechanism of Sanskrit.
- They will also learn the traditional Sanskrit theories and principles of Phonetics.

VII. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) SOCIOLOGY

DEPARTMENT: SOCIOLOGY

Program Outcomes

Course Outcomes: B.A. (Prog.) Sociology (NEP UGCF 2022)

Core Course(s) (1st Year)

BA Prog./MDS Sociology: Discipline Specific Core 01: An Invitation to Sociology (Semester I)

Course Objectives:

This course is a broad introduction to the discipline of sociology. It introduces students to understanding the „social" in everyday life. It helps to link the social to the personal and to develop a sociological imagination. It interrogates the taken-for-granted structures in society

and familiarises students with some of the fundamental concepts and concerns of the discipline.

Course Learning Outcomes:

After studying the paper, the students should be able to: 1. Appreciate and adopt a sociological perspective to the understanding of reality 2. Understand the basic concepts in Sociology and relate them to the micro and macro aspects of social life. 3. Develop a sociological way of thinking.

B.A. Prog./MDS Sociology: Discipline Specific Core 02: Family and Marriage (Semester I)

Course Objectives:

1. To introduce various approaches, issues, and debates in the study of family and marriage.
2. To introduce different concepts and theoretical understanding of marriage and family in different societies.
3. To develop critical insights into the changing trends in family and marriage.

Course Learning Outcomes:

1. Understanding the multiple perspectives in the study of the family.
2. Familiarity with the concepts relevant to the study of marriage
3. Developing an understanding of the changing trends in family and marriage.

BA Prog./MDS Sociology (as Major): Discipline Specific Core 03: Sociology of India (Semester II)

Course Objectives:

1. To provide an outline of the institutions and processes of Indian society.
2. To initiate students into viewing Indian society through a sociological lens.
3. To enable students to understand important social structures of Indian society.

Course Learning Outcomes:

1. Recognize the bases of plurality of Indian society.
2. Outline the concepts of caste, tribe, class, village, and religion.
3. Debate the basis of order and dynamics of social change in India.

BA Prog./MDS Sociology (as non-Major): Discipline Specific Core 03: Sociology of India (Semester II)

Course Objectives:

1. This paper aims to provide an outline of the institutions and processes of Indian society.

2. The central objective is to initiate students into studying Indian society through a sociological lens.

3. The students will be able to identify key social structures of Indian society.

Course Learning Outcomes:

1. Recognize the bases of plurality of Indian society.
2. Explain the concepts of caste, tribe, class, village, and religion.
3. Examine the dynamics of social change in India.

BA Prog./MDS Sociology: Discipline Specific Core 04: Religion and Society (Semester II)

Course Objectives:

The course introduces students to a sociological understanding of religion including beliefs, practices, and religious organisations. The three key components of this course are - sociological approaches to the understanding of religion; manifestations of religion in diverse forms and practices; and a focus on contemporary religious practices. The objective of the course is to offer an empirical and comparative view of religion and its role in society.

Course Learning Outcomes:

1. Understanding religion from a cultural, social, symbolic and comparative perspective.
2. Understanding religion as a socially constituted reality.
3. Familiarity with some of the contemporary issues in the sociology of religion.
4. A sociological understanding of the diversity of religious life.

Core Course(s) 2nd Year

DSC 05 Classical Sociological Thinkers (Semester – III)

On successful completion of the course students will be able to:

- To recognize interconnections between classical sociological theories and contemporary research.
- To grasp the relevance of classical sociological theory in the development of the discipline.
- To apply theoretical concepts to examine social issues and concerns.

DSC 06 Polity and Society (Semester – III)

On successful completion of the course students will be able to:

- Identify and explain the concepts that are integral to a sociological study of politics.
- Illustrate the specific ways in which politics is shaped processually in particular historical contexts.

- Examine the relationship between political institutions and other social and economic institutions and processes

DSC 07 Post-Classical Sociological Thinkers (Semester -IV)
Students will be able to:

- Understand the post-classical developments in Sociological Theory.
- Outline the interdisciplinary nature of sociological concepts.
- Apply the theories they learned in empirical contexts and construct theoretically informed sociological research.

DSC 08 Economic Sociology (Semester IV)
Students will be able to**:**

- *Understand* the key concepts and theories of economic sociology as a specialised branch of knowledge.
- *Identify* the diverse ways in which the economy is embedded in other aspects of society and culture.
- *Use* sociological concepts and theories to understand and analyse the transformations of the economy and its key processes and institutions from a comparative perspective.
- *Generate* research questions and arguments about the intersections of economy and society**.**

Discipline Specific Elective Course(s) 3rd Year

DSE-3: Sociology and Social Policy (Semester – V)
On successful completion of the course students will be:

- Develop critical and analytical skills with respect to examining the complex dynamics involved in social policy making process.
- Recognise, evaluate and dissect policies of social importance in the interest of people, society and environment.
- Exhibit the requisite analytical skills to evaluate and improve social policy

DSE-4: Animals and Society (Semester – VI)
On successful completion of the course students will be:

- Outline the substantive issues and debates within which classic and contemporary humananimal scholarship is situated.
- Examine the sociological, political, personal and legal aspects of human-animal relationships.
- Identify the intersections of gender, caste, class and other identities that shape human animal interactions.

VIII. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) STATISTICS

DEPARTMENT: STATISTICS

Program Outcomes

Course Outcomes: B.A. (Prog.) Statistics (NEP UGCF 2022)

Core Course(s) (1st Year)

B.A. (Prog.) with Statistics as Minor (Semester I)

DISCIPLINE SPECIFIC CORE COURSE – 1: DESCRIPTIVE STATISTICS

Learning Objectives

- To motivate students towards intrinsic interest in statistical thinking.
- To analyze and interpret data.

Learning outcomes

- Understand the basic concepts of Statistics.
- Able to employ different types of data.
- Employ the graphical methods of displaying data.
- Use measures of locations.

B.A(P) with Statistics as Minor (Semester II)

DISCIPLINE SPECIFIC CORE COURSE – 2: Statistical Methods

Learning Objectives:

- To know the difference between discrete and continuous random variables.
- To develop the thinking of students so that they can use the concepts of statistical probability distribution in real life.
- To understand the concept of random variables, probability distributions and expectation

Learning Outcomes:

- Concept of random variables.
- Basic concepts of discrete & continuous random variables.
- Distinguish between Moments generating functions & Cumulant generating functions
- Concept of joint, marginal and conditional probability distribution for two dimensional random variables and their independence.
- Discrete probability distributions with their properties.
- Continuous probability distributions with their properties.

Core Course(s) (2nd Year)

DSC-3: SAMPLING DISTRIBUTIONS (Semester – III)

After completing this course, students should have developed a clear understanding of:

- Basic concepts of hypothesis testing, including framing of null and alternative hypothesis.
- Hypothesis testing based on a single sample and two samples using both classical and p value approach.
- Chi square distribution.
- Analyze categorical data by using Chi square techniques.
- t and F distributions and their applications.

DSC-4: ELEMENTS OF STATISTICAL INFERENCE (Semester – IV)

After successful completion of this course, students should be able to:

- Understand estimation theory, point and interval estimations.
- Comprehend the characteristics of a good estimator and different methods of estimation.
- Apply the techniques in data analysis.
- Develop the best/most powerful statistical tests to test the hypotheses regarding unknown population parameters by using the Neyman-Pearson theory.

Core Course(s) 3rd Year

DSC-5: INTRODUCTION TO DESIGN OF EXPERIMENTS (Semester – V)

After completing this course, students should have developed a clear understanding of

- The fundamental concepts of Design of Experiments.
- Introduction to planning valid and economical experiments.
- Completely randomized design.
- Randomized block design.
- Latin square design.
- Balanced incomplete block design.
- Full and confounded factorial designs with two levels.
- Fractional factorial designs with two levels.

DSC-6: Survey Sampling (Semester – VI)

- After successful completion of this course, students should be able to:
- Understand the fundamental concepts of population and sample and the principles of sample survey
- Describe the value and methodologies for sample surveys versus other approaches to collecting
- information from populations.

- Determine the appropriate sample size and its allocation for nationwide sample surveys or for surveys
- to be conducted in a program area.
- Identify a proper sampling frame and select primary sample points.
- Apply steps involved in selecting a sample using Simple Random Sampling with or without
- replacement, Stratified Sampling, Systematic Sampling and Ratio and Regression Methods of Estimation

IX. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) TAMIL

DEPARTMENT: TAMIL

Program Outcomes

The programme is designed to achieve the following outcomes:

PO1:

The Tamil Syllabus for B.A (Prog.) Under Graduate programme seeks to cover these key areas of study, i.e. historical and descriptive Study of the Language and Literature, study of the language for specific purposes, such as Film Script, Advertisement, Official Writing, Creative Writing, Essay writing, Translation, Journalistic Writing, Writing for New Media etc.;

PO2:

Study of specific areas like Tamil Folk Literature, Comparative studies in Tamil, Manuscriptology, Teaching Methodology etc.; study of the theories of literature and criticism; Specific Literary Terms, Autobiography and study of the history and important literary texts of Tamil Literature.

PO3:

The Programme seeks to develop both theoretical and practical knowledge in these fields in an interdisciplinary manner so as to develop a comprehensive understanding of the complexities of the language and literature in the context of socio-cultural, historical and professional specificities.

Course Outcomes: B.A. (Prog.) Tamil (NEP UGCF 2022)

Core Course(s)

NA

Generic Elective (GE)

Semester: I-Introduction to Tamil Folklore-A

Program Learning Outcomes (POs)

The intense study will equip the students to understand the particular field of knowledge in Tamil and inculcate an ability to write on these disciplines. This study shall explain the role of literature to understand Folklore and Culture and the need of these disciplines in understanding and production of literary texts.

Semester: I-Basic Tamil-B

Program Learning Outcomes (POs)

The course will enable the students to obtain the basic skills of reading, writing and speaking in Tamil along with building up a primary vocabulary. After the course they can read and write simple Tamil sentences, can figure out words having conjunct character, and can have basic everyday conversation.

GE-2:

Semester : II- Introduction to Comparative Studies in Tamil-A

Program Learning Outcomes (POs)

The intense study will equip the students to understand the particular field of knowledge in Tamil and inculcate an ability to write on these disciplines. This study shall explain the role of literature to understand Comparative Literature, Translation and Culture and the need of these disciplines in understanding and production of literary texts.

Semester : II- Pre-Intermediate Tamil-B

Program Learning Outcomes (POs)

The course will facilitate the students to understand the nuances of the language by empowering them with better reading, writing and conversational skills. It will also enable them to translate from Tamil to English and vice versa.

Ability Enhancement Course (AEC)

Semester: I& II- IL.1-Translation and Interpretation in Tamil-A

Program Learning Outcomes (POs)

Students will be able to build various professional, technical, and linguistic skills to take the job of translation and interpretation. Their knowledge in various fields in both the source and the target languages will help them translate in multiple areas and take interpretation jobs for the different target groups; the translator works with the written material/texts; the interpreter will mediate between languages orally. The course will equip the students with the theories of translation as techniques of translation well as practical aspects of translation.

Semester: I& II- IL.1-Basic Tamil- Introduction to Tamil-B

The primary objective of this Course is to facilitate Non-Tamil students to acquire fully well the four skills (speaking, listening, reading & Writing) of the written, spoken & varieties of triglossic Tamil Language for day-to-day conversation and to provide a wider knowledge of Tamil Language, literature and society of Tamil Nadu, India & Abroad.

Disciline Specific Course (DSC) (III- VI Semester)

DSC-3: *Semester: III- Study of Tamil Novels – Minor*

Program Outcomes (POs)

Introduction of European thoughts in Tamil land - impact of missionaries and European administration - introduction of print medium and modern education - emergence of modernity in Tamil - development of new literary genres: prose, non-fiction, novel, short story and modern poetry - modern play-theatre- development of novel as narratives in Tamil.

Course Outcomes (COs)

The study will motivate the students to develop their Tamil literary heritage of storytelling - socio-political issues in fiction writings - emergence of various genres in Novel - representation of novels from the first Tamil novel to contemporary novels - trends and various approaches in fiction writing.

DSC-4: *Semester: IV- Study of Tamil Short Stories*

Program Outcomes (POs)

Introduction of European thoughts in Tamil land - impact of missionaries and European administration - introduction of print medium and modern education - emergence of modernity in Tamil - development of new literary genres: prose, non-fiction, novel, short story and modern poetry - development of novel as narratives in Tamil.

Course Outcomes (COs)

The study will motivate the students to develop their Tamil literary heritage of storytelling - socio-political issues in fiction writings - emergence of various genres in short stories - representation of short stories from the first Tamil short story to contemporary novels - trends and various approaches in fiction writing.

DSC-5: *Semester: V- Study of Selected Texts: Modern Tamil Poetry*

Program Outcomes (POs)

The aim of the course is to enable the students to analyze the Emergence of modernity in Tamil - development of new literary genres - prose, non-fiction, and modern poetry -

emergence and development of modern poetry - earlier attempts and various schools of modern poetry - major poets and their contribution - contemporary developments.

Course Outcomes (COs)

The study will motivate the students to develop their Tamil literary heritage - Socio-Political issues - emergence of various genres - representation of poetry - trends and various approaches in poetry writing - reading and analysis of modern poetry.

DSC-6: *Semester: VI- Study of Selected Plays-Tamil*

Program Outcomes (POs)

Emergence of modernity in Tamil - development of new literary genres - non-fiction, novel, short story , modern poetry & Play - emergence and development of modern play - earlier attempts and various schools of modern Drama, play - major play Directors and their contribution - contemporary developments.

Course Outcomes (COs)

This study will enable the students to understand the Ancient forms of Tamil Drama – *Kūttu*, a traditional Tamil theatre - Tamil theatre tradition - European drama and Tamil dramatists - emergence of new theatre performance - dramatic works in modern period - post independent Tamil drama - emergence of new theatre movements - reading and analysis of modern plays.

Generic Elective Course (GE) (III-VI Semester)

GE-3: Semester: III- Creative Writing in Tamil-A

Program Outcomes (POs)

Writing is the most potent and yet the simplest form of human expression. Unlike speech, writing transcends the barriers of space and time. The craft of writing has multiple dimensions - novels, short stories, essays, stage plays, fiction, non-fiction, screen-writing, mainline print and visual media, profile-writing, interviews, blogs, web-writing, travelogues and experimental pieces. The Course is intended to help students express ideas through a medium that has appreciable aesthetic appeal.

Course Outcomes (COs)

This course is designed to make understand creativity and attain a firm command over the medium. This creative writing course includes practical activity so that students are able to test and experiment with something they have learnt in the classroom.

Semester: III- Intermediate Tamil -B

Program Outcomes (POs)

This semester course aims at creating an awareness of Dynamics of Tamil words and introducing classification weak & strong verbs- Infinitive forms of Verbs Auxiliaries and Tamil script learning.

Course Outcomes (COs)

This semester course aims at creating an awareness of Dynamics of Tamil words and introducing classification weak & strong verbs- Infinitive forms of Verbs Auxiliaries and Tamil script learning.

GE-4: *Semester: IV- Essay Writing in Tamil-A*

Program Outcomes (POs)

The purpose of the course is to train students to write a good essay with a focused subject of discussion in eminently readable Tamil.

Course Outcomes (COs)

The course would enlighten the students fashioning a coherent set of ideas into an argument, analyzing the facts and figures collected, raising counter arguments and preparing a conclusion which are intended to be explained through some of the best writings of celebrated essayists.

Semester: IV- Advance Tamil-B

Program Outcomes (POs)

This semester course aims at creating an awareness of Dynamics of Tamil words and introducing classification weak & strong verbs- Infinitive forms of Verbs Auxiliaries and Tamil script learning.

Course Outcomes (COs)

The course will enable the students to obtain the skills of reading, writing and speaking in Tamil along with building up a vocabulary. After the course they can read and write Tamil sentences, can figure out words having conjunct character, and can have everyday conversation.

GE-5: *Semester: V- Specific Literary Terms (Tamil)-A*

Program Outcomes (POs)

This course offers a glimpse into the exciting world of literary terms, critical theories and points of view that are commonly used in East and West to classify, analyze, interpret, and write the history of works of literature.

Course Outcomes (COs)

This purpose of the study is to help students identify and absorb the essential terms and devices used by authors to gain a thorough understanding of the works and to keep them current with the rapid and incessant changes in the literary and critical scene and to take into account new publications in literature, criticism and scholarship.

Semester: V- Advance Tamil -II –B

Program Outcomes (POs)

The primary objective of this Paper is introducing Perfect tense formation-Continuous tense formation -Comparative Clause etc.

Course Outcomes (COs)

The course will enable the students to obtain the skills of reading, writing and speaking in Tamil along with building up a vocabulary. After the course they can read and write Tamil sentences, can figure out words having conjunct character, and can have everyday conversation.

GE-6: ***Semester: VI- Autobiography -A***

Program Outcomes (POs)

The aim of the course is to enable the students to know the history of the author, his struggles and significant achievements, the conditions and various forces of his period that shaped him and his everlasting contribution to the society. As the author portrays his life truthfully with an emotional and personal appeal, the study will enable the students to establish a personal rapport with the life and philosophy of the author as reflected in the autobiographical work.

Course Outcomes (COs)

The study of autobiographical works will guide the students to appreciate the higher ideals that need to be followed and the pitfalls that need to be avoided in their own lives.

Semester: VI- Free creative writing in Tamil Medium –B

Program Outcomes (POs)

The purpose of the course is to train students to write a good script with a focused subject of discussion in eminently readable Tamil. Fashioning a coherent set of ideas into an argument, analyzing the facts and figures collected, raising counterarguments and preparing a conclusion are intended to

be explained through some of the best writings of celebrated Book, Academician, Politician, Industrialist Journalist etc.

Course Outcomes (COs)

This paper tries to Introducing brief History of Journalism & Mass Communication in the Tamil and Tamil speaking world-Different Language styles used for different programs such as News Reading, Interviews, Drama & sports news etc.

Ability Enhancement Course (AEC) (III & IV Sem)

AEC-2: *Semester: III & IV- IL.2- Journalistic writing in Tamil-A*

Program Outcomes (POs)

The course aims at teaching and training the students in journalistic writing in the language so that they are well-equipped in the news covering, reporting, writing and editing for the electronic and print media. It also aims at enhancing their competence for freelancing and in the choice of their areas such as sports, movies, entertainment, business, social, political, historical etc.

Course Outcomes (COs)

After completing the course, the students are expected to start preparing news items, reporting, taking interviews in Tamil for the media houses, electronic and print. The study shall provide sufficient training in writing and reporting (oral), conducting interviews and panel discussions for electronic media. The students will also be aware of the law and ethics involved in Journalism.

AEC-2: *Semester: III & IV- IL.2- Intermediate Tamil (B)*

Program Outcomes (POs)

This semester course aims at creating an awareness of Dynamics of Tamil words and introducing classification weak & strong verbs- Infinitive forms of Verbs Auxiliaries and Tamil script learning.

Course Outcomes (COs)

The course will enable the students to obtain the basic skills of reading, writing and speaking in Tamil along with building up a primary vocabulary. After the course they can read and write simple Tamil sentences, can figure out words having conjunct character, and can have basic everyday conversation.

X. COURSE: B.A. (MULTIDISCIPLINARY STUDIES) TELUGU

DEPARTMENT: తెలుగు TELUGU

Program Outcomes

The programme is designed to achieve the following outcomes:

PO1:

The Telugu Syllabus for B.A. (Prog.) Under Graduate programme seeks to cover these key areas of study, i.e. historical and descriptive Study of the Language and Literature, study of the language for specific purposes, such as Film Script, Advertisement, Official Writing, Creative Writing, Essay writing, Translation, Journalistic Writing, Writing for New Media etc.;

PO2:

Telugu literature has more than a thousand year's history, and it is one of the classical languages in India. The course provides students with a substantive understanding of literature and the history of Telugu. This course gives an outline of Telugu literature. The main aim of the course is to introduce the important poets and their wrings to Telugu students from the 11th century to the 15th Century.

PO3:

The Programme seeks to develop both theoretical and practical knowledge in these fields in an interdisciplinary manner so as to develop a comprehensive understanding of the complexities of the language and literature in the context of socio-cultural, historical and professional specificities.

Course Outcomes: B.A. (Prog.) Telugu (NEP UGCF 2022)

Core Course(s)

NA

Generic Elective (GE)

Semester: I- Telugu Literature and History: An Introduction -A

Program Learning Outcomes (POs)

The course provides students with a substantive understanding of literature and the history of Telugu. This course gives an outline of Telugu literature cultural development of Telugu people as seen through the lens of literature. It will discuss the role of literature in the reconstruction of history from an ancient period to present times and the importance of literature in reflecting the social, political and cultural histories. It mainly focuses on the study of Andhra history through literary works, especially the historical writings by various authors.

Semester: I-Basic Telugu-B

Program Learning Outcomes (POs)

The course will enable the students to obtain the basic skills of reading, writing and speaking in Telugu along with building up a primary vocabulary. After the course they can read and write simple Telugu sentences, can figure out words having conjunct character, and can have basic everyday conversation.

Semester : II- Telugu Shathaka sahithyam -A

Program Learning Outcomes (POs)

The course will enable the students to understand the unique features of Shataka, i.e. Shataka Sankhya, Makuta, Metreand the history of Shataka literature in Telugu. After completing the course, Students will be able to understand how to read Telugu verses and remember the verses and develop the Telugu vocabulary.

Semester : II- Pre-Intermediate Telugu -B

Program Learning Outcomes (POs)

The course will facilitate the students to understand the nuances of the language by empowering them with better reading, writing and conversational skills. It will also enable them to translate from Telugu to English and vice versa.

Ability Enhancement Course (AEC)

Semester: I& II- IL.1-Translation and Interpretation in Telugu-A

Program Learning Outcomes (POs)

Students will be able to build various professional, technical, and linguistic skills to take the job of translation and interpretation. Their knowledge in various fields in both the source and the target languages will help them translate in multiple areas and take interpretation jobs for the different target groups; the translator works with the written material/texts; the interpreter will mediate between languages orally. The course will equip the students with the theories of translation as techniques of translation well as practical aspects of translation.

Semester: I& II- IL.1-Basic Telugu- Introduction to Telugu-B

The primary objective of this Course is to facilitate Non-Telugu students to acquire fully well the four skills (speaking, listening, reading & Writing) of the written, spoken & varieties of triglossic Telugu Language for day-to-day conversation and to provide a wider knowledge of Telugu Language, literature and society of Andhra Pradesh, Telangana India & Abroad.

Core Course(s) 2nd Year

DSC-3: History of Telugu Literature (Up to 15th Century) (Semester – III)

On successful completion of the course students will be:

- After completing the course, students will be able to understand the History and evaluation of Telugu literature up to the 15th century.
- They can get the knowledge about the poets and their works between 9th to 15th century.

DSC-4: History of Telugu Literature (16th to 18th Century) (Semester – IV)

On successful completion of the course students will be:

- After completing the course, students will understand the History and evaluation of Telugu literature from the 16thto 18th century.

General Elective Course(s) 2nd Year

GE-3: Telugu Sathaka Sahityam (Semester –III & IV)

On successful completion of the course students will be:

- The course will enable the students to understand the unique features of Shataka, i.e. Shataka Sankhya, Makuta, Metre and the history of Shataka literature in Telugu.
- After completing the course, Students will be able to understand how to read Telugu verses and remember the verses and develop the Telugu vocabulary.

Ability Enhancement Course(s) 2nd Year

AEC- (A) II: Journalistic Writings in Telugu (Semester –III & IV)

On successful completion of the course students will be:

- After completing the course, the students are expected to start preparing news items, reporting, and taking interviews in Telugu for the media houses, both electronic and print.
- The study shall provide sufficient training in writing and reporting (oral), conducting interviews and panel discussions for electronic media.
- The students will also be aware of the law and ethics involved in Journalism.

Ability Enhancement Course(s) 2nd Year

AEC- (B) II: Intermediate Telugu (Semester –III & IV)

On successful completion of the course students will be:

- The course will enable the students to understand the nuances of the language by empowering them with better reading, writing and conversational skills.
- It will also enable them to translate from Telugu to English and vice versa.

Core Course(s) 3rd Year

DSC-5: Literary Criticism in Telugu (Semester – V)

On successful completion of the course students will be:

- After learning this course student will understand about the ancient Indian literary theories in Telugu.
- influence of modern western literary theories in Telugu literature.

DSC-6: Social and Cultural History of Telugu People (Semester – VI)

On successful completion of the course students will be:

- The plan of study is divided into following parts and students will get to know about: the geographical location, early history, social fabric and the state of economy, village organization and customs and manners; Telugu society, their province, language, institutions of administration, religious practices, festivities.
- socio - cultural activities from Satavahana Age to Kakatiya Rule; from subservience to Sovereignty during Kakatiya - s, the role of feudatories, industry and trade, religion, cast and society, literature and art; the Vijayanagara Empire, the Golconda kingdom, South Indian spread of Andhra - s and, socio - cultural changes during English rule and after Independence are taken up for elucidation.

General Elective Course(s) 3rd Year

GE-4: **Specific Literary Terms (Semester – V & VI)**

On successful completion of the course students will be:

- The purpose of the study is to help students identify and absorb the essential terms and devices used by authors to gain a thorough understanding of the works
- To keep them current with the rapid and incessant changes in the literary and critical scene and, to take into account new publications in literature, criticism, and scholarship.

2. COURSE: B.COM. (PROG.) COMMERCE

DEPARTMENT: COMMERCE

Program Outcomes

Programme learning outcomes for B. Com. include various subject specific skills and generic skills like mind management, creativity, and innovation of competencies in diverse areas of Commerce and Business, the achievement of which will be demonstrated by the students of B. Com. Programme for the award of bachelor degree. The programme learning outcomes of B. Com. also enable a student to prepare for further study, employment, and good citizenship.

Further, the difference in the level of achievement of programme outreach provides for comparing of learning levels and standards across different college/institution. The various learning outcomes of the programme are mentioned below:

- **PO1**: Bachelor's Degree in Commerce results in giving comprehensive knowledge of Marketing, Human Resource Management, Business and Corporate Law, Economics, Finance, Accounting, Management, Tax and several other branches of Commerce that includes Investment, Insurance, and Banking. Thus, this programme helps students in building a concrete footing for advanced studies in Commerce and to stand with the requirement of business sector, insurance, banking seeking youth fit for employment.
- **PO2**: Students undergoing this programme will be equipped to the world of work, particularly, work of the future. The student will get a first-hand exposure of working in the real world.
- **PO3**: Students completing this programme will be able to develop managerial knowledge and tactical dexterity, with a broader skill set and encourages them to seek out audacious, innovative solutions for today's business.
- **PO4**: Completion of this programme will also enable the students to formulate business problems and provide innovative solutions thus, molding them into future visionaries, management leaders that are compassionate yet efficient.
- **PO5**: The course provides an extreme and rigorous base for teaching, research, and allied business administrations.
- **PO6**: The focus of UGCF of commerce and business education is aimed at improving the student's abilities and helping them to become a competent business leader who can contribute in nation building. Commerce education is not related only with knowing how to organize and apply skills related to business, industry and economy, but it further accelerates the process of thinking in a pragmatic manner about nation building through effective utilization of skills, resources, manpower and one's abilities.

Course Outcomes: B.Com. (Prog.) Commerce (NEP UGCF 2022)

Core Course(s)

BC: DSC- 1.1: Business Organisation and Management (Semester I)

The course aims to develop an understanding of business organisations, functions and challenges of management and contemporary issues in management. The Learning Outcomes of this course are as follows:

- Explain the dynamics of business organisations and recent management practices.

- Describe varied perspectives related to the business environment and entrepreneurship.
- Analyse how the organisations adapt to an uncertain environment and decipher decision- making techniques.
- Analyse the relationship amongst functions of management i.e. planning, organizing, directing and controlling.
- Analyse the change in the working pattern of modern organisations.

BC: DSC- 1.2: Business Laws (Semester I)

To impart basic knowledge of the important business laws relevant for the inception and conduct of general and business activities with relevant case laws. The Learning Outcomes of this course are as follows:

- Analyse the basic aspects of contracts vis-a-vis agreements and subsequently enter into valid business propositions.
- Describe various modes of discharge of contract and remedies available in case of breach.
- Recognize and differentiate between the special contracts.
- Analyse the rights and obligations under the Sale of Goods Act.
- Attain skills to form and manage entrepreneurial ventures as LLP.

BC: DSC- 1.3: Financial Accounting (Semester I)

The course aims to help learners to acquire conceptual knowledge of financial accounting, to impart skills for recording various kinds of business transactions and to prepare financial statements. The Learning Outcomes of this course are as follows:

- Analyse the generally accepted accounting principles while recording transactions and preparing financial statements.
- demonstrate the accounting process under a computerized accounting system.
- Measure business income applying relevant accounting standards.
- Evaluate the impact of depreciation and inventories on Business Income.
- Prepare the Financial Statements of sole proprietor firms and Not-For-Profit Organisations.

DSC- 2.1: Corporate Accounting (Semester II)

The course aims to help learners to acquire conceptual knowledge of corporate accounting systems and to learn the techniques of preparing the financial statements of companies. After completion of the course, learners will be able to:

- Analyse accounting for share capital, debentures, bonus shares, redemption of preference shares and debentures of a company.

- Prepare financial statements of companies manually as well as using online software.
- Interpret the Valuation of Intangible Assets and Shares.
- Describe accounting for Amalgamation and Internal Reconstruction of Companies.
- Prepare Annual Reports of companies and analyse the voluntary and mandatory information contained in them.

DSC- 2.2: Company Law (Semester II)

The course aims to develop and comprehend business and its processes in accordance with the provisions of the Companies Act, 2013 while analysing case laws. After completion of the course, learners will be able to:

- Analyse the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act, 2013 and Rules.
- Prepare the basic legal documents required for formation of a company.
- Analyse the process and documents required for raising capital for the company.
- Analyse the managerial composition of companies and examine the process of company meetings.
- Evaluate the framework of dividend distribution and develop understanding of the winding up process including Insolvency Resolution.

DSC- 2.3: Human Resource Management (Semester II)

The course aims to acquaint the learners with the techniques and principles to manage human resources of an organisation.

After completion of the course, learners will be able to:

- Evaluate the importance of contemporary and emerging HR issues.
- Analyse the concept and sources of recruitment and selection process.
- Devise employee training and development programs.
- Design performance appraisal techniques and compensation schemes.
- Design HR policies for grievance redressal, employee health, safety, welfare, social security, and stress-free work life balance.

Core Course(s) 2nd Year

DSC-3.1: BUSINESS STATISTICS (Semester – III)

On successful completion of the course students will be:

- examine and understand the various descriptive properties of statistical data.
- identify probability rules and concepts relating to discrete and continuous random

- variables to answer questions within a business context.
- analyse the underlying relationships between the variables to use simple regression
- models.
- analyse the trends and tendencies over a period of time through time series analysis.
- identify and apply index numbers to real life situations.

DSC-3.2 : FUNDAMENTALS OF FINANCIAL MANAGMENT (Semester – III)

On successful completion of the course students will be:

- understand thoroughly the conceptual framework of financial management. Further
- learners will have an insight into the concept of time value of money and risk and return.
- analyse capital budgeting process and demonstrate decision making ability using different techniques of capital budgeting.
- demonstrate the computation of cost of capital; critically analyse, understand and
- demonstrate different capital structure theories and factors affecting capital structure decision of a firm
- analyse, understand and demonstrate different theories of dividend and factors affecting dividend policy.
- understand the concept of working capital and demonstrate the estimation of working capital requirement of a firm; critically examine and decide optimum credit policy for a firm.

DSC-3.3 : PRINCIPLES OF MARKETING (Semester – III)

On successful completion of the course students will be:

- develop understanding of basic concepts of marketing, marketing philosophies and environmental conditions affecting marketing decisions of a firm.
- describe the dynamics of consumer behaviour and process of market selection through STP stages.
- analyse the process of value creation through marketing decisions involving product development.
- analyse the marketing decisions involving product pricing and its distribution.
- explore marketing decisions involving product promotion and also to equip them with the knowledge of various developments in the marketing area that may govern marketing decisions of a firm.

Skill Enhancement Course (SEC) (Common Pool)

SEC 98: INNOVATION AND ENTREPRENEURSHIP (Semester – III)

On successful completion of the course students will be:

- Identify and comprehend the concepts of creativity, innovation and invention in various contexts.
- Enrich their theoretical and conceptual foundations in entrepreneurship.
- Gain hands-on experience that shall empower them to identify business and social opportunities and venture in the entrepreneurial landscape.
- Prepare themselves to take informed decisions in establishing start-ups and ongoing innovation in organisations
- Work as a team

Value Addition Course(s) (VAC) (Common Pool)

VAC: EMOTIONAL INTELLIGENCE (Semester – III)

On successful completion of the course students will be:

- Self-Awareness, Self-Management, Social Awareness & Relationship Management.
- Discover personal competence and techniques of building emotional intelligence.
- Gain insights into establishing positive relationships.

SEMESTER-IV

DSC-4.1 : ENTREPREUSHIP AND NEW VENTURE PLANNING (Semester – IV)

On successful completion of the course students will be:

- discern distinct entrepreneurial traits.
- develop an understanding of the process and nature of entrepreneurship.
- identify the different ways in which entrepreneur manifests in start-ups ·
- comprehend the entrepreneurial process for initiating new venture creation.
- design strategies for the successful implementation of innovative ideas of new ventures.

DSC-4.2 : COST ACCOUNTING (Semester – IV)

On successful completion of the course students will be:

- understand and analyse the different cost concepts.
- determine various components of cost of production;
- compute unit cost and total cost by preparing a cost statement;

- compute employee cost, employee productivity and employee turnover;
- determine cost for different industries using job costing, process costing, contract costing and service costing

DSC-4.3 : INTERNATIONAL BUSINESS (Semester – IV)

On successful completion of the course students will be:

- analyse the process of globalization and its impact on growth of international business.
- evaluate the changing dynamics of the diverse international business environment.
- analyse the theoretical dimensions of international trade as well as intervention measures adopted.
- analyse the significance of different forms of regional economic integration and the role played by various international economic organisations.
- evaluate the forms of foreign direct investment and analyse benefits and costs of FDI.
- create awareness about emerging issues in international business such as outsourcing and sustainable development.

Skill Enhancement Course (SEC) (Common Pool)

SEC: YOGA IN PRACTICE (Semester-IV)

On successful completion of the course students will be:

- Student will form an understanding of the concept of yoga.
- Students will learn various aspects of the science of yoga.
- Theoretical and practical knowledge of Aasanas and pranayams to lead a balanced life.

Value Addition Course(s) (VAC) (Common Pool)

VAC 4: DIGITAL EMPOWERMENT (Semester-IV)

On successful completion of the course students will be:

- Use ICT and digital services in daily life.
- Develop skills to communicate and collaborate in cyberspace using social platforms, teaching/learning tools.
- Understand the significance of security and privacy in the digital world.
- Evaluate ethical issues in the cyber world

Core Course(s) 3rd Year

SEMESTER-V

DSC-5.1: INCOME TAX-LAW AND PRACTICE (Semester – V)

On successful completion of the course students will be:

- understand the basic concepts of income tax and determine the residential status of different persons;
- compute income under the head salaries and income from house property;
- compute income under the head profits and gains of business or profession and capital gains;
- compute income under the head _income from other sources and understand the
- provisions relating to income of other persons included in assessee‘s total income; and
- understand various deductions and computation of total income and tax liability of individuals.

DSC-5.2: BUSINESS ECONOMICS (Semester – V)

On successful completion of the course students will be:

- explain the nature and scope of Business Economics.
- analyse how consumers try to maximize their satisfaction by spending on different
- goods.
- identify the relationship between inputs used in production and the resulting outputs and costs.
- analyse and interpret various facets of and pricing under different market situations.
- analyse about the contemporary issues and applications in Micro Economics.

DSC-5.3: MANAGEMENT ACCOUNTING (Semester – V)

On successful completion of the course students will be:

- understand thoroughly the conceptual framework of Management Accounting; identification of differences between different forms of accounting—Financial, Cost and Management; distinction between cost control and cost reduction

  (a) understand budgetary control system as a tool of managerial planning and control; prepare various types of budgets.

  (b) understand standard costing system as a tool of managerial control; calculation of variances in respect of each element of cost and sales; control ratios
- understand the concept of marginal cost and marginal costing; preparation of income statements using absorption and variable costing; learning of cost-volume-profit

analysis and break-even analysis through statements, mathematical and graphical approaches; identification of key factor and determination of profitability; determination of cost indifference point.

- understand the concept of relevant cost and make decisions related to different business situations using marginal costing and differential costing techniques
- demonstrate and facilitate basic understanding of different contemporary issues involved in management accounting like Responsibility Accounting, Divisional Performance Measurement.

Discipline Specific Elective Course(s) (DSE) 3rd Year

DSE- 5.1: ORGANIZATION BEHAVIOUR (Semester – V)

On successful completion of the course students will be:

- demonstrate understanding of the basic concepts of organisational behaviour and their applicability in contemporary organisations.
- analyse the various means of managing people at workplace.
- interpret the complex nature of human behaviour and group dynamics.
- critically evaluate leadership styles and strategies.
- summarize the ways to build supportive organisational culture

DSE- 5.5: BUSINESS MATHEMATICS (Semester – V)

On successful completion of the course students will be:

- identify proficiency in using different mathematical tools in solving real life business and economic problems.
- analyse how matrices are used as mathematical tool in representing a system of equations.
- explain differential calculus to solve simple business problems.
- explain mathematical formulation and solution of problems related to finance including
- different methods of interest calculation, future and present value of money.
- identify business problems involving linear relationships between decision variables and their determining factors.

DSE- 5.5: AUDITING (Semester – V)

On successful completion of the course students will be:

- summarize the basic concepts of auditing and acquaint with latest developments in the area of auditing;
- describe the need of auditing and role of auditors;
- demonstrates the principles, procedures and techniques of auditing;
- interpret the contents of audit reports;
- analyse the provisions of Companies Act, 2013 relating to auditor and auditing.

Skill Enhancement Course (SEC) (Common Pool)

SEC 106: PERSONAL FINANCE PLANNING (Semester-V)

On successful completion of the course students will be:

- examine the meaning and appreciate the relevance of financial planning.
- demonstrate the concept of investment planning and its methods.
- examine the scope and ways of personal tax planning.
- Analyse insurance planning and its relevance.
- interpret insight into retirement planning and its relevance.

SEMESTER-VI

DSC-6.1: BUSINESS ANALYTICS (Semester – VI)

On successful completion of the course students will be:

- describe skills for computation and aggregation of data using spreadsheet.
- explain data with the help of pivot tables and pivot charts.
- analyse data using R Packages and interpret the results.
- identify Linear Regression Models using spreadsheet & R and interpret the results.
- examine textual data analysis using R.

DSC-6.2: CORPORATE GOVERNANCE (Semester – VI)

On successful completion of the course students will be:

- describe the concept and significance of corporate governance in a business setup and
- analyse the role of board of directors.
- explain important dimensions in corporate governance.
- analyse global corporate failures, understand International Codes and its implications.
- comprehend corporate governance regulatory framework in India.
- assess and analyse the problems of corporate governance in Indian Inc.

DSC-6.3: GST AND CUSTOMS LAW (Semester – VI)

On successful completion of the course students will be:

- understand the rationale of Goods and Services Tax (GST), constitutional amendment
- carried out to install GST in India and comprehend the composition and working of GST council;
- interpret the meaning of supply under GST law, differentiate between intra-state and
- inter-state supply, provisions related to place of supply, time of supply and compute the value of supply;
- understand the utilization of input tax credit and the provisions of reverse charge mechanism;
- understand various returns under GST and payment of taxes; and
- understand concepts of Customs Act, various custom duties and computation of the assessable value for charging customs duty.

3. COURSE: B.Sc. (HONS.) LIFE SCIENCES

DEPARTMENT: LIFE SCIENCES

Program Outcomes

Zoology is one of the most fundamental branch of biology to be studied at undergraduate level. It is required to learn and understand about animal diversity and to appreciate their variability in relation to their morphology, anatomy and behaviour. The course will also provide an opportunity to learn and understand about evolution. Students will be able to appreciate evolutionary parameters using various bioinformatics and computational tools used in modern sciences. The course further enhances understanding of classical genetics to comprehend distribution of various traits among populations, their inheritance, ethnicity and students can correlate these aspects with contemporary and modern subjects like genomics, metagenomics and genome editing tools. Skills gained in practical and theory will be helpful in designing holistic public health strategies for social welfare. Studying zoology as a part of life science course, further enhances knowledge of applied subjects to hone students' skills to build a career and become an entrepreneur in the field of aquatic biology, sericulture, apiculture etc. After completion of this course, students could contribute as policy makers in wildlife conservation, and environment protection.

Program Specific Outcomes (PSO)

Students enrolled in B.Sc. (Program) Life Sciences will study and acquire complete knowledge of disciplinary and allied biological sciences. At the end of graduation, they would have expertise which will provide them competitive advantage in pursuing higher studies from India and abroad or seek jobs in academia, research or industries. Students should be able to identify, classify and differentiate in types of chordates and non-chordates based on their morphological, anatomical and systemic organization. This will create a curiosity and awareness among them to explore animal diversity and take up wildlife photography or wildlife exploration as a career option. The procedural knowledge about identifying and classifying animals will help students gain professional advantages in teaching, research and taxonomist jobs in various Government organizations, such as Zoological Survey of India or National Sanctuaries. Acquired practical skills in biochemistry and biotechnology can be used in pursuing a career as a scientist in the pharmaceutical industry in India or abroad. Students will be gaining basic experimental skills in genetics, biotechnology, qualitative and quantitative microscopy, and also enzymology that will give them an edge to pursue higher studies. The skill enhancement courses will hone skills in rearing fish, bees and silk moths for generating self-employment. Students can acquire expertise to join clinical and research laboratories for diagnostic assays, hematology,

histopathology, staining procedures etc. They will be able to examine and assess some basic physiological functions and interpret physiological charts.

Course Outcomes: B.Sc. (Hons.) Life Sciences (NEP UGCF 2022)

Core Course(s) (1st Year)

BOT-DSC-1: Plant Diversity and Systematics (Sem I)

This course will be able to impart basic knowledge and understanding of the diversity of plants and microbes. The general characteristics of plants and microbes and the possible relationships between them. The students will be able to learn approaches used for identification and classification of various groups of plants.

CHEM-DSC-1: Basic Concepts of Organic Chemistry (Sem I)

The students will be able to Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt. The students will understand the fundamental concepts of stereochemistry. Students will be able to formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved. The students will learn and identify many organic reactions and their mechanisms including electrophilic addition, nucleophilic addition, nucleophilic substitution, electrophilic substitution and rearrangement reactions.

ZOO-DSC-1: Diversity of Animals (Sem I)

The students will be able to learn about the diversity of non-chordates and chordates. They will be made familiar with the traits, morphotaxonomy, structural layout, and physiological systems of several animal groupings. After learning they should be able to recognise the economic significance of chordates and non-chordates as well as the role they play in the ecosystem. They should understand the phylogeny and evolutionary links between invertebrates and vertebrates to identify structural and functional similarities.

Zoo-LS-DSC-06:– Cell and Developmental Biology of Animals (Sem II)

By studying this course, students will be able to explain the structure and functions of cell organelles involved in diverse cellular processes. Students will know the evolution of different concepts in developmental biology. Students will be able to understand the process of gamete formation from stem cell population to mature ova and sperm. The students will know the differences between Spermatogenesis and Oogenesis. Students will be able to comprehend the

sequence of steps leading to the fusion of gametes and learn the contribution of sperm and ova to zygote formation. Students will be able to understand how polyspermy is avoided in the animal kingdom. Students will learn the mechanisms underpinning cellular diversity and specificity in animals. Students will learn the methods and tools related to developmental biology to understand different processes of embryogenesis.

Generic Elective (GE) (Common Pool)

GE-1 Human Physiology (Sem I)

The students will be able to understand the principles of normal biological function in the human body. Students will learn basic human physiology and correlate it with histological structures. After completion of this course the students will be able to understand the homeostasis in animals in response to changes in their external environment.

Skill Enhancement Course (SEC) (Common Pool)

SEC-1 Personality Development and communication (Sem I)

After studying this course, students will be able to understand the importance of written and oral communication in day-to-day working of the organisation. The students will be able to develop interpersonal skills and problem-solving skills. Students will also be able to understand the role of body language in effective communication.

Value Addition Course (VAC) (Common Pool)

VAC-1 Emotional Intelligence (Sem I & II)

After completion of course, students will be able to learn Self-Awareness, Self-Management, Social Awareness & Relationship Management. Students will be able to discover personal competence and techniques of building emotional intelligence. Students will gain insights into establishing positive relationships.

Core Course(s) 2nd Year

DEPARTMENT: BOTANY

DSC-3: Plant Cell and Developmental Biology (Semester-III)

On successful completion of the course students will be able to:

- become familiar with the structure and functions of various components of plant cell
- understand the processes of cell growth and its regulation
- comprehend the structure, organization and functions of various tissues of the plant organs

- get acquainted with the reproductive processes in the life cycle of angiosperms
- appreciate the interactions between the developmental pathways resulting in the differentiation of plant body
- recognise the importance of plant developmental biology in the improvement and conservation of plants

DEPARTMENT: CHEMISTRY

DSC-3: Chemistry of Major and Minor Biogenic Elements (Semester-III)

On successful completion of the course students will be able to:

- Explain the periodicity in atomic and ionic radii, electronegativity, ionization enthalpy, electron gain enthalpy of elements of the periodic table.
- Explain oxidation states with reference to the existence of elements in unusual and rare oxidation states in alkalides, carbides and nitrides.
- Explain vital role of sodium, potassium, calcium and magnesium ions etc. in biological systems and the role of oxides of N and S in our environment.
- Predict distribution of major and minor biogenic elements in human beings

DEPARTMENT: ZOOLOGY

DSC-3: Biochemistry: Basic Concepts of metabolism (Semester – III)

On successful completion of the course students will be:

- better understand the properties of carbohydrates, proteins, lipids, and their importance in biological systems.
- explain the biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions
- comprehend the concept of enzyme, its mechanism of action and regulation.
- appreciate the importance of high energy compounds, electron transport chain, synthesis of ATP under aerobic and anaerobic conditions.
- acquire knowledge related to the role of TCA cycle in central carbon metabolism, importance of anaplerotic reactions and redox balance.

Discipline Specific Elective Course(s) 2nd Year

DEPARTMENT: BOTANY

DSE-III: Evolutionary Biology of Plants (Semester – III)

On successful completion of the course students will be:

- understand the essential theories in evolution
- differentiate between micro and macroevolution and the forces shaping evolution
- construct phylogenetic trees based on morphological and molecular data
- understand evolution of life

DEPARTMENT: CHEMISTRY

DSE-III: Chemistry of Major & Minor Biogenic Elements (Semester – III)

On successful completion of the course students will be:

Learning outcomes By studying this course, students will be able to:

- Explain the periodicity in atomic and ionic radii, electronegativity, ionization enthalpy, electron gain enthalpy of elements of the periodic table.
- Explain oxidation states with reference to the existence of elements in unusual and rare oxidation states in alkalides, carbides and nitrides.
- Explain vital role of sodium, potassium, calcium and magnesium ions etc. in biological systems and the role of oxides of N and S in our environment.
- Predict distribution of major and minor biogenic elements in human beings

DEPARTMENT: ZOOLOGY

DSE-III: Wildlife Conservation & Management (Semester – III)

On successful completion of the course students will be:

- Appreciate wildlife in general and realize its conservation and management in particular.
- Better understand the application of the principles of ecology and animal behaviour to formulate strategies for the management of wildlife populations and their habitats.
- Understand the management practices required to achieve a healthy ecosystem for wildlife population along with emphasis on conservation and restoration.
- comprehend the key factors for loss of wildlife and important strategies for their in situ and ex situ conservation.
- recognize the techniques for estimation, remote sensing and Global Position Tracking for wildlife.
- gain knowledge about the wildlife diseases and the quarantine policies.
- know about the Protected Area Networks and Ecotourism in India.
- Perform critical thinking, literature review; scientific writing as well as presentations; and participation in citizen science initiatives with reference to wildlife.

Core Course(s) 2nd Year

SEMESTER IV

DEPARTMENT: BOTANY

DSC-4: Ecology and Evolution (Semester-IV)

- After successful completion of the course the student shall have adequate knowledge about the basic principles of ecology and evolution.

DEPARTMENT: CHEMISTRY

DSC-4: Chemistry of Carboxylic Acids & their Derivatives, amines and Heterocycles (Semester-IV)

On successful completion of the course students will be:

- Understand terms: ligand, denticity of ligands, chelate, coordination number.
- Systematically name coordination compounds.
- Discuss the various types of isomerism possible in Octahedral and Tetrahedral coordination compounds.
- Use Valence Bond Theory to predict the structure and magnetic behaviour of metal complexes and understand the terms inner and outer orbital complexes.
- Explain the meaning of the terms Δo., Δt, pairing energy, CFSE, high spin and low spin and how CFSE affects thermodynamic properties like lattice enthalpy and hydration enthalpy.
- Explain magnetic properties and colour of complexes on basis of Crystal Field Theory
- Understand reaction mechanisms of coordination compounds and differentiate between kinetic and thermodynamic stability.
- Discuss the application of coordination compounds in the biological systems such as Heamoglobin, myoglobin and some enzymes

DEPARTMENT: ZOOLOGY

DSC-4: Fundamentals of Human Physiology (Semester-IV)

On successful completion of the course students will be:

- Have an enhanced knowledge and appreciation of human physiology
- Recognize and identify principal tissue structures and functions.

- Better understand the functions of important physiological systems including the nervous system, muscular system, endocrine and reproductive system
- Learn an integrative approach to understand how these separate systems interact to yield integrated physiological responses to maintain homeostasis in the body along with feedback mechanism.

Discipline Specific Elective Course(s) 2nd Year

Semester IV

DEPARTMENT : BOTANY : NA

DEPARTMENT: CHEMISTRY

DSE-IV: Chemistry of Colloids and Adsorption (Semester – IV)

On successful completion of the course students will be:

- Understand colloid solutions, preparation of sols.
- Understand the concept of Electrical double layer, charge on colloidal particles.
- Characterize the colloids sols, learn colloid phenomenon like Tyndall effect, Brownian movement, electrophoresis, dialysis, coagulation and flocculation.
- Understand adsorption, types of adsorption. Characteristics, factors affecting adsorption and its applications

DEPARTMENT: ZOOLOGY

DSE-IV: Fish and Fisheries (Semester – IV)

On successful completion of the course students will be:

- acquire basic knowledge of physiology and reproduction in fishes.
- analyse different kinds of water and identify/differentiate among various kinds of fishes.
- equip the students with the knowledge on the procedures for artificial and induced breeding which can be learnt by visiting any fish farm or demonstrated in research labs in college/Departments.
- have more knowledge of the in-land and marine Fisheries in India and to explore ways in which it can contribute to the Indian economy.
- know more about the different methods of fishing and fish preservation Fish and Fisheries which can be employed for export and storage of commercial fishes.
- develop skills for entrepreneurship or self-employment in fisheries-related business.

Core Course(s) 3rd Year

SEMESTER V

DEPARTMENT: BOTANY

DSC-5: Plant Physiology and Metabolism (Semester – V)

On successful completion of the course students will be:

- correlate physiological and metabolic processes with functioning of the plants.
- establish the link between theoretical principles and experimental evidence.

DEPARTMENT: CHEMISTRY

DSC-5: Coordination Chemistry and its application in Biological systems(Semester – V)

On successful completion of the course students will be:

- Understand terms: ligand, denticity of ligands, chelate, coordination number.
- Systematically name coordination compounds.
- Discuss the various types of isomerism possible in Octahedral and Tetrahedral coordination compounds.
- Use Valence Bond Theory to predict the structure and magnetic behaviour of metal complexes and understand the terms inner and outer orbital complexes.
- Explain the meaning of the terms Δo., Δt, pairing energy, CFSE, high spin and low spin and how CFSE affects thermodynamic properties like lattice enthalpy and hydration enthalpy.
- Explain magnetic properties and colour of complexes on basis of Crystal Field Theory
- Understand reaction mechanisms of coordination compounds and differentiate between kinetic and thermodynamic stability.
- Discuss the application of coordination compounds in the biological systems such as Heamoglobin, myoglobin and some enzyme.

DEPARTMENT: ZOOLOGY

DSC-5: Evolutionary Ecology Zoo-LS-DSC-15 (Semester – V)

On successful completion of the course students will be:

- better understand the diverse relationships that the organisms have in the environment.
- analyze the patterns of distribution of animals in different regions and ecosystems.
- gain insight to the major events in history of life and major theories of evolution.
- know the fundamental concepts of natural selection, speciation, mass extinction and macro-evolution.

- explain the characteristics, dynamics, and growth of populations.
- appreciate the characteristics of the community, ecosystem development and climax theories.
- gain knowledge about the relationship of the evolution of various species and the environment they live in.

Discipline Specific Elective Course(s) 3rd Year

DEPARTMENT: BOTANY

DSE-5: Natural resource Management (Semester – V)

On successful completion of the course students will be:

- understand the different resources available in nature.
- learn the importance of each resource along with the threats to these resources.
- gain an in-depth understanding of management of these resources and also restoration of natural ecosystems 16. study the importance of sustainable practices
- gain an insight into various initiatives taken the world over to save our natural resources.
- understand the concept of clean energy and management of waste

DEPARTMENT: CHEMISTRY

DSE-5: Polynuclear Hydrocarbons , Pharmaceutical Compounds, UV- Visible & IR Spectroscopy **(Semester – V)**

On successful completion of the course students will be:

- Understand the fundamentals of polynuclear hydrocarbons and heterocyclic compounds through the study of methods of preparation, properties and chemical reactions with underlying mechanism.
- Gain insight into the basic fundamental principles of IR and UV-Vis spectroscopic techniques.
- Use basic theoretical principles underlying UV-visible and IR spectroscopy as a tool for functional group identification in organic molecules.

DEPARTMENT: ZOOLOGY

DSE-5: Integrative systems Biology and Bioinformatics (Semester – V)

On successful completion of the course students will be able to:

- know more about the basic of systems biology and bioinformatics
- better understand about the availability of experimental data through biological databases, usage of small molecules, nucleic acids, protein sequences, in a variety of biological sciences domains
- gain more knowledge about the gene sequence annotation, protein structure prediction and gene enrichment prediction
- acquire skills to perform and understand pair-wise and multiple sequence alignment
- better understand a variety of computational tools and approaches, as well as their use in in silico drug discovery, structural bioinformatics, and functional genomics etc.

DSE-5: Reproductive Biology and Assisted Reproductive technologies (Semester – V)

On successful completion of the course students will be able to:

- get an in-depth understanding of morphology, anatomy, and histology of male and female reproductive organs.
- know different processes in reproduction starting from germ cell formation to fertilization and consequent pregnancy, parturition, and lactation.
- compare estrous and menstrual cycles and their hormonal regulation.
- comprehend the interplay of various hormones in the functioning and regulation of the male and female reproductive systems.
- know about the diagnosis and management of infertility, including the latest methods, technologies, and infrastructure in assisted reproduction.
- better understand the modern methods of contraception and their use in family planning strategies.
- translate their understanding into the development of products like non-hormonal contraceptives; contribute to drug discovery programs as well as neonatal and maternal health programmes and work with family planning teams to understand the needs and preferences of individuals belonging to lower socioeconomic groups.

Core Course(s) 3rd Year

SEMESTER VI

DISCIPLINE SPECIFIC CORE Botany : NA

DSC Botany: NA

DEPARTMENT: CHEMISTRY

DSC-6: Conductance, Electrochemistry and Chemical Kinetics (Semester – VI)

On successful completion of the course students will be able to:

- Explain the factors that affect conductance, migration of ions and application of conductance measurement.
- Understand the importance of Nernst equation, measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements.
- Understand rate law and rate of reaction, theories of reaction rates and catalysts; both chemical and enzymatic.

DSE CHEMISTRY: NA

DEPARTMENT: ZOOLOGY

DSC-6: Basics of Immunology (Semester – VI)

On successful completion of the course students will be able to:

Learning Outcomes By studying this course, students will be able to

- acquire knowledge of immunogenicity and antigenicity
- better understand innate and acquired immunity.
- appreciate and analyze the various humoral and cellular components of the immune system.
- comprehend the role of immune system in health and disease.
- gain knowledge of autoimmunity, immunodeficiency and hypersensitivity.
- have an enhanced understanding of vaccine and vaccination.