

Department of Home Science

Program Educational objectives of Home Science as a subject at undergraduate level

(BA with Home Science as a subject)

Home Science is an interdisciplinary field of study. As a discipline Home Science integrates the components of science, social science and technology to facilitate the study and to enhance the quality of life. The major fields studied under Home Science include Food and Nutrition, Human development, Clothing and Textile, Family resource management and Extension and communication. The individual, the family and the community are the foci of Home Science. The field of foods and nutrition under the discipline has vast scope ranging from alleviation of malnutrition from the micro to macro level, preventive and promotive and therapeutic care in hospitals, in food industries as well as food service managers in various establishments. Clothing and textiles can have family and industrial orientation in today's market economy with an entrepreneurial base. India being one of the foremost garment exporting countries and having huge domestic market, there is enough scope for academic development and commercial applications. Women and development and environment are major social and political concerns which need to be addressed in Home Science education to make development gender sensitive, relieve drudgery of women's work by innovating appropriate science and technology. There is also the need to generate considerable research data for policy development of women in the context of a patriarchal society. Home Science places considerable emphasis on human development across life span. Some specific areas studied are early childhood, adolescence, child abuse, family welfare programs, non formal education. The curriculum has an integrated approach of combining theory and practical and fieldwork. The competency based courses of Home Science have sound market value and would lead to social and economic empowerment. Field placement should be incorporated to allow for the integration of skill in the learning processes with transfer of knowledge from laboratory to classroom and from classroom to field. Home Science has contributed a great deal towards national development.

The main objectives of the subject are

- To understand and appreciate role of Home Science, in the development and well-being of individuals, families and communities.
- To learn about the sciences and technologies which enhance the quality of life of the people
- To acquire professional and entrepreneurial skills for economic empowerment of student in particular, and community in general
- To develop professional skills in the fields of food and nutrition, clothing and textiles, housing and interior decoration, human development, extension and communication
- To prepare young students for studies, research and extension work
- To take science from the laboratory to the people

Subject outcomes

- Women empowerment
- Skill development and enhancement
- Capacity building
- Entrepreneurial development
- Student centric job oriented courses

B.A. Home Science

Semester I

H001- Fundamental concepts of Family Resource Management

(Max. Marks 50)

(Internal 15 + External 35)

Course objectives:

1. Provide knowledge of various concepts and principles of Family Resources Management
2. Awareness of resources- their availability, generation and allocation for improvement in the quality of life of families
3. Generate awareness on money management.

Learning outcomes:

On successful completion of the course the student will be able to

- Develop awareness about management in family.
- Students will be able to recognize the importance of wide use of resources in order to achieve goals.
- Have knowledge about the management of resources.
- Develop understanding of concepts of income and expenditure
- Provide skills to tackle family finance.

B.A. Home Science

Semester I

H002 Housing and Interior Decoration

(Max Marks- 50)

(Internal assessment – 15 + external – 35)

Course objectives

1. Knowledge of concepts of housing as a structurally sound and functionally efficient unit with well designed living and work space area as.
2. Knowledge of functional dwelling for comfort and safety.

Learning outcomes

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

- Understand the factors influencing selection of house site or house.
- Understand the basic principles underlying house planning.
- Draw house plans for various income groups.
- Understand the advantages and disadvantages of rented, privately owned or an apartment.
- Understand the principles of art and design and their applicability in interior decoration **B.A.**
Home Science

Semester II

H004- Introduction to Textile Science

(Max. Marks- 50)

(Internal assessment- 15 + External – 35)

Course objectives

- 1- To develop an understanding of fibers, yarns and their formation.
- 2- To impart knowledge about selection and care of fabrics.

Learning outcomes

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

- Understand characteristics and use of common textile fibers.
- Be able to identify different fibers.
- Understand methods and steps of fabrics formation.
- Understand and identify about traditional textiles of India.
- Get an understanding of fabric selection and care.
- Understand general rules of laundering and laundering agents.

B.A. Home Science

Semester II

H005- Fabric Formation and Finishes

(Max Marks- 50)

(Internal Assessment- 15 + External – 35)

Course objectives

1. To develop an understanding of fabric formation techniques
2. To acquaint the students with various fabric finishes.
3. To impart skill in dyeing and printing techniques.

Learning outcomes

On completion of the course the students will be able to

- Understand basic fabric formation methods such as weaving, knitting and non woven fabrics.
- Understand and identify different fabric formation techniques.
- Develop knowledge and skill about different dyes, dyeing techniques and printing techniques.

B.A. Home Science

Semester III

H007 – Fundamentals of Foods and Nutrition

(Max Marks – 50)

(Internal assessment – 15 external 35)

Course objectives

1. To give students an understanding of the concepts of foods, their function and classification, nutrition, balanced diet, basic food groups.
2. To acquaint students with the physiology of digestion and basal metabolism and need for energy.
3. To provide students the understanding of nutrients, their sources, functions, requirements and affects of deficiencies.

Learning outcomes

- Understand food, nutrients and their functions.
- Understand about balanced diet basal metabolism, energy requirement.
- Understand functions, sources and requirements of different nutrients and associated deficiency diseases.
- Understand about food poisoning and food adulteration.

B.A. Home Science

Semester III

H008 - Food Preservation

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives

To develop knowledge about principles of food preservation and different food processing methods.

Learning out comes

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

- Understand objectives and methods of cooking.
- Get acquainted with principles of food preservation and different food preservation methods.
- Understand the role of microorganisms and fermentation.

B.A. Home Science

Semester IV

H010- Mother Craft and Child Care

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives

1. To introduce the students to the field of human development, concept, scopes, dimensions and interrelations.
2. To sensitize the students to social and cross cultural contexts in human development.
3. To sensitize the students to interventions in the field of human developments.

Learning Outcomes:

After studying the above course student will understand

1. The field of human development concept, scope, dimension and interrelations.
2. Importance of social and cross cultural contexts in human development.
3. The concepts of child care and mother craft.

B.A. Home Science

Semester IV

H011- Introduction to Clothing Construction

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives

1. To develop the consciousness for clothing, its importance, safety, care and comfort.
2. To impart knowledge regarding selection of clothing.
3. To develop skills for garment construction.

Learning Outcomes-

After studying the above course the student will develop:

1. Consciousness for clothing, its importance, safety, care and comfort.
2. Capability to identify the various fabrics and its importance regarding selection of clothing.
3. Skill for garment construction.

B.A. Home Science

Semester V

H013- Human development

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives

This course will make students understand:

- 1- Regarding various developmental tasks of different age groups.
- 2- Concepts of human development and give students knowledge about the rights and needs of different age groups.
- 3- Concepts of old age and special needs of old age.

Learning Outcome:

After studying the above course students will understand:

1. Concepts of various developmental task of different age group.
2. Care and need of children, adolescents, adult and old age.

B.A. Home Science

Semester V

H014- Family welfare and community education

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Objectives-

- 1- To make them understand about the children rights and National Policy for Children.
- 2- To give the concept of different categories of special needs of children and adolescents.
- 3- Student should have the knowledge about family and child welfare services working at National and International level
- 4- Concept of community education.

Learning Outcome-

After studying the above course students will understand the concept of family and community education.

B.A. Home science

Semester VI

H016- Nutritional Management in Health and Disease

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives

- 1- To develop the concept of different health conditions.
- 2- To make them understand Nutritional Management.
- 3- Nutritional management during different health and disease condition.

Learning Outcomes-

After studying the above course students will be able to understand how to manage nutrition during different age groups and different health and disease condition.

B.A. Home Science

Semester VI

H017- Fundamental Concepts for Extension Education.

(Max. Marks 50)

(Internal assessment- 15 + External 35)

Course objectives-

1. To the students understand the meaning, importance and need of extension education.
2. Role of home science in extension education for development
3. Communication, its meaning, process and characteristics.

Learning Outcome-

After studying the above course students will understand the fundamental concepts of extension education, its role in rural development and concept of communication.

Vision, Mission, PEO, PO, PSO & CO

Department of Biotechnology (Kumaun University)

VISION

- To produce the best human resource in the area of Biotechnology by imparting quality education and training to the students. Department visualizes the scholastic achievements of its students in order to fulfill the demand of food, fuel, fiber and medicines for ever-increasing global population in a sustainable manner.

MISSION

- To develop trained human resource in the field of biotechnology.
- To develop the Department as an internationally reputed center for research in biotechnology.
- To develop the Department as a resource centre for providing instrumentation and training facility to the researchers and students in the region.

Programme Educational Objectives (PEOs)

M.Sc. Biotechnology Program:

The Program Educational Objectives (PEOs) for the M.Sc. Biotechnology program describe accomplishments that graduates are expected to attain within two years after graduation

PEO-1: To enable graduates to pursue research career in industry and academia by providing fundamental and practical knowledge in the field of Biotechnology.

PEO-2: To empower the students with analytical and research skills, enable them to critically analyze existing literature in an area of specialization and to nurture entrepreneurial endeavors.

PEO-3: To develop biotechnologists with professional ethics in order to address global and societal issues for sustainable development.

M.Sc. Microbiology Program:

The Program Educational Objectives (PEOs) for the M.Sc. Microbiology program describe accomplishments that graduates are expected to attain within two years after graduation:

PEO-1: To train graduates in basic and advanced areas of microbiology, Industrial Microbiology, Agriculture & Environmental Microbiology and other related subjects along with sensitizing them to the scope for research.

PEO-2: To empower the students with analytical and research skills, to nurture entrepreneurial endeavors and to prepare a competent generation of microbiologists, capable of excelling in careers of their choosing.

PEO-3: To develop microbiologists with skills to pursue careers both in academia as well as industry such as pharmaceutical, food and bioprocess industries.

Programme Outcomes (POs)

The Graduates of Masters programs (**M.Sc. Biotechnology** and **M.Sc. Microbiology**) will be able to:

PO-1: Master of Science knowledge: Apply the knowledge of biotechnology, microbiology, biochemistry fundamentals, and bioinformatics to the solution of complex biological problems.

PO-2: Problem analysis: Identify, formulate, review research literature, and analyze complex biological problems reaching substantiated conclusions using various principles of biotechnology, bioinformatics, microbiology, biochemistry, cell and molecular biology sciences.

PO-3: Design/development of solutions: Design solutions for complex biological problems and design protocols or processes that meet the

specified needs with appropriate consideration for the public health and safety, conservation of biodiversity, better understanding of the microorganisms, and using bioinformatics tools for finding solutions of various crippling human/plant diseases with ethical, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems: Use the various protocols developed through extensive research-based knowledge and methods including design of experiments, analysis and interpretation of data, and provide valid and reproducible conclusions.

PO-5: Modern Molecular Biology and Bioinformatics tools usage: Develop new technologies, protocols, resources, using modern molecular biology, biotechnology and bioinformatics tools and apply it to solve complex human health problems, plant stress tolerance and conserve floral biodiversity of Himalayan region focusing on medicinally important plants with an understanding of the limitations of this region.

PO-6: Post Graduate Student and society: Apply the classic and modern biological theoretical and practical knowledge gained to address societal, health, microbial and plant biodiversity studies, safety, ethical and cultural issues and the consequent responsibilities relevant to the professional up-gradation of the student and society as a whole.

PO-7: Environment and sustainability: Understand the impact of Himalayan hot spot of biodiversity. The professional PG students will have a better understanding of societal and environmental concerns, and demonstrate their knowledge, and need for sustainable development.

PO-8: Ethics: Apply ethical principles established by different government agencies and commit to research ethics, responsibilities and norms to undertake their current and future research and development.

PO-9: Individual and team work: Be an independent thinker and researcher effectively as an individual, and as a member or leader of different teams, and in multidisciplinary research Institutions and Universities.

PO-10: Communication: Communicate effectively on complex research activities with the scientific community and with society at large, as a scientist or a teacher, be well versed with scientific writing and write

effective reports and design research projects, make effective presentations, and be able to defend it efficiently.

PO-11: Project management and finance: Write good research and development projects relevant to the needs of society and environment and attract extra mural funds for himself and his team in the Institute or University from various funding agencies and manage R&D projects effectively.

PO-12: Life-long learning: Apply the discipline, ethics and knowledge obtained to engage in independent and life-long learning in their respective fields of interest wherever they go for further higher studies or jobs.

Programme Specific Outcome (PSOs)

For M.Sc. Biotechnology program:

After the successful completion of M.Sc. Biotechnology program, the students will able to:

PSO-1: Have basic and advanced understanding of Biotechnology in its various domains including, health, nutrition, agriculture, biodiversity conservation, Biosafety etc.

PSO-2: Address research questions related to all the above mentioned domains through carrying out specific experiments.

PSO-3: Appear and successfully qualify the higher level examinations of various agencies like DBT(Department of Biotechnology), CSIR (Council of Scientific and Industrial Research), ARS (Agriculture Research Services), ICAR(Indian Council of Agriculture Research),and many more, so as to get chance to do research from reputed institutes within country and abroad with sound fellowships

PSO-4: Have enough subject knowledge to move ahead in entrepreneurship endeavors in biotechnology.

For M.Sc. Microbiology program:

Upon successful completion of M.Sc. (Microbiology), the students will be able to:

PSO-1: Get equipped with a theoretical and practical understanding of microbiology and appreciate how microbiology is applied in manufacture of industrial products

PSO-2: Know how to source for microorganisms of industrial importance from the environment

PSO-3: Identify techniques applicable for Improvement of microorganisms based on known biochemical pathways and regulatory mechanisms.

PSO-4: Appreciate the diversity of microorganism and microbial communities inhabiting a multitude of habitats and occupying a wide range of ecological habitats.

PSO-5: Understand in depth the occurrence, abundance and distribution of microorganism in the environment and their role in the environment and also get expertise on different methods for their detection , characterization and industrial applications

PSO-6: To move ahead in entrepreneurship endeavors in microbiology

PSO-7: Appear and successfully qualify the higher level examinations of various agencies , so as to get chance to do research from reputed institutes within country and abroad with sound fellowships

Course Outcomes (COs)

- Two courses *M.Sc. in Biotechnology* and *M.Sc. in Microbiology* are currently being run by the department besides the *Ph.D. program* on diverse aspects of *Biotechnology and Life-sciences*

1. Course name: M.Sc. (Biotechnology)		
Semester	Paper Code and Title	Course Outcome
I	Biochemistry (IS1)	<ul style="list-style-type: none"> • Theoretical knowledge of various topics as per the syllabus • Exhaustive study of enzyme kinetics and bio-molecules, different metabolic pathways. • Familiarization with Bioenergetics concepts, generation of ATP • Experimentation related to enzyme kinetics, protein/sugar/lipid estimation using different methods, titrations etc.
I	Cell & Developmental Biology (IS2)	<ol style="list-style-type: none"> 1. Study of cell theory, Cell organelles, Ultrastructure, Roles of cell organelles. 2. Exhaustive study of Cell Signaling pathways, secondary messengers etc 3. Understanding of Developmental biology: Stem cell and cancer, Differentiation in plant tissue 4. Familiarization with methods of cell-study, various forms of Microscopy, staining for microscopy etc.
I	Molecular Biology (IS3)	<ol style="list-style-type: none"> 1. Understanding of Genome organization, Development of basic concepts in DNA/RNA structure, Replication, Repair & Recombination. 2. Knowledge of transcription and translation in prokaryotic and eukaryotic system. 3. Development of concepts of Oncogenesis, oncogenes and tumor suppressor genes. 4. Hands on training on DNA & RNA isolation by different techniques; plasmid isolation, transformation, Electrophoresis, quality check of Nucleic acids, restriction digestion, PCR, RFLP etc
I	Microbiology and Industrial	<ol style="list-style-type: none"> 1. Theoretical knowledge of microbial diversity & systematics, Microbial growth and physiology;

	Applications (IS4)	<p>Study of size, shape and growth pattern, nutrition type of microbes.</p> <ol style="list-style-type: none"> 2. Experimental knowledge of Sterilization, disinfection, safety in microbiological laboratory. Preparation of media, Isolation and maintenance of organisms by plating, Streaking and Serial dilution methods, Storage of microorganisms, Gram Staining and enumeration of microorganisms. 3. Familiarization of assays related to antibiotics production and demonstration of antibiotic resistance
I	Biostatistics and Computer Applications (IS5)	<ol style="list-style-type: none"> 1. Comprehensive study of various topics including Data representation methods, measures of central tendency, variance 2. Practical knowledge of application of correlation and regression analysis, test of significance: F and t tests, Chi square test etc. 3. Study on sigma plotter, null hypothesis, Bioinformatic methods, Basic idea of computer languages 4. Familiarization with biological databases, sequence, structure and strain database, Secondary and sequence analysis of DNA, RNA and proteins
II	Plant Biotechnology (2S1)	<ol style="list-style-type: none"> 1. Knowledge of various topics including Organogenesis; Somatic embryogenesis; Regulation and applications; Artificial seed production; Micropropagation; Somaclonal variation; Androgenesis, somaclonal variation etc 2. Development of concepts in Agrobiolgy, Genetic transformation: its various methods and applications 3. Hands on training on Plant Tissue Culture, artificial seed production, cell suspension cultures, fermentation, secondary metabolite production and plant transgenics 4. To understand the importance of Plant Tissue Culture is an essential requirement for genetic improvement, conservation, mass propagation and maintenance of uniformity of traits through generations.

II	Analytical Techniques (2S2)	<ol style="list-style-type: none"> 1. Concept building in various topics including: Spectroscopy, chromatography, electrophoresis, centrifugation and their different variants 2. Practical knowledge of Chromatographic techniques, Spectroscopy techniques, protein isolation/purification using different techniques ,quantitative and qualitative estimations of biomolecules 3. Development of understanding on Radioactivity, Radioisotopes and their uses in biology, measurement of radioactivity etc. 4. Theoretical basic concept building in Protein crystallization; Enzyme and cell immobilization techniques
II	Genetic Engineering (2S3)	<ol style="list-style-type: none"> 1. Elaborated structure and properties of genetic material; Restriction enzymes and other enzymes related to genetic manipulation. 2. Theoretical knowledge of advance techniques like, FISH, EMSA, CHIP etc. 3. Introduction to Cloning vectors, cloning methodologies, PCR and its applications; DNA sequencing 4. Hands-on experience in genomic DNA isolation, Restriction digestion, gel-purification, ligation, transformation, induction of recombinant protein synthesis, protein purification etc etc.
II	Molecular Genetics (2S4)	<ol style="list-style-type: none"> 1. Theoretical knowledge of various topics of classical and modern genetics including: useful bacterial phenotypes, mutations, mutagenesis, transformation, conjugation and transduction. 2. Familiarization with concepts of Mendelian and non-Mendelian genetics, including: genetic diseases, human pedigrees, x-linked inheritance, Mitochondrial inheritance, genomic imprinting, behavioral traits etc 3. Study of molecular genetics of Lambda phage, lytic/lysogenic cycles. Population genetics, migration etc.
II	Genomics & Proteomics (2S5)	<ol style="list-style-type: none"> 1. Knowledge of Structural organization of prokaryotic, eukaryotic and organelle genomes. DNA

		<p>sequencing-principles and translation to large scale projects; Recognition of coding and non-coding sequences and gene annotation; Tools for genome analysis-RAPD,RFLP, DNA fingerprinting etc</p> <ol style="list-style-type: none"> 2. Familiarization with developments in Genome sequencing projects related to plants, animals, and different groups of microbes. 3. Concept building in pharmacogenomics, functional genomics and proteomics, PISA, DNA-array , protein-array etc
III	Bioprocess Engineering & Technology (3S1)	<ol style="list-style-type: none"> 1. Basic concept building in Basic principle of Biochemical engineering, including, Isolation, screening and maintenance of industrially important microbes various topics as per the syllabus and isolation, screening and maintenance of microbes important for industries. 2. Application of microbes in waste management and food industry. 3. Study of downstream processing techniques: filtration, centrifugation, sedimentation, flocculation; Cell disruption; Storage and packaging
III	Environmental Biochemistry & Biotechnology (3S2)	<ol style="list-style-type: none"> 1. Theoretical knowledge of Environment; Basic concepts; Resources; Eco system: plants, animals, microbes; Ecosystem management; Pollution, Renewable resources; Sustainability; Microbiology of degradation and decay. 2. Study of role of biotechnological techniques in environment protection. Waste water collection; control and management; Waste water treatment; Sewage treatment through chemical, microbial and biotech techniques 3. Concept building in alternate energy sources: Biomass as source of energy; Bioreactors; Rural biotechnology; Biocomposting; Biofertilizers; Vermiculture; Organic farming; Bio-mineralization; Biofuel etc.
III	Animal Biotechnology (3S3)	<ol style="list-style-type: none"> 1. Theoretical knowledge of various topics as per the syllabus including basic cell culture techniques; Primary culture, secondary culture; Continuous cell lines; Suspension cultures; Transfection,

		<p>pleuripotency, stem cells etc</p> <ol style="list-style-type: none"> 2. Study of various approaches related to vaccine production, disease diagnostic assays and many other assays involved in animal health management. 3. Concept building in animal reproductive biology, Animal genomics and DNA forensics: Embryo transfer; Micromanipulation of animal embryos; Transgenic animal technology; RFLP, RAPD, proteomics, metabolomics; DNA Barcoding; Detection of adulteration in meat using DNA based methods; microbial forensics etc.
III	Immunology & Immunotechnology (3S5)	<ol style="list-style-type: none"> 1. Theoretical knowledge of various topics including, antigens, antibodies, adaptive and innate immunity, organs and cells of immune system etc 2. Hands on training on advanced immunological techniques viz., ELISA and its variants, western blotting, immunodiffusion methods, immunoelectrophoresis, determination of blood groups etc. 3. Idea of Immune responses generated by Lymphocytes, Antigen-Antibody interactions. 4. Vaccine technology and Clinical immunology: Immunity against Bacteria, viral, fungal and parasitic infections; Tumor immunology; DNA and protein based vaccines, plant-based vaccines, reverse vaccinology; Peptide vaccines, conjugate vaccines; Hybridoma etc.
III	Molecular Virology (3S6)	<ol style="list-style-type: none"> 1. Knowledge of genome organization of different viruses e.g. Rabies, HIV, Hepatitis etc. and pathologies associated with their infection in various hosts. 2. Development of anti-virals, anti-viral host immunity, vaccinations against viruses etc. 3. Study of plant viruses: CaMV, TMV, CTV, RDV etc; their structure, genome organization and associated diseases. 4. Familiarization with Methods to study plant viruses; Infectivity assays – Sap transmission, insect vector transmission, agroinfection (using Agrobacterium); serological methods etc.

IV	Project/Thesis work	<ol style="list-style-type: none"> 1. Research on various topics as per the expertise and facilities available in the department (and with collaborators), including hands on training on various advanced molecular and analytical techniques 2. An overall study on the concerned plant/animal/microbial system addressing any of relevant and pursuable scientific problems. 3. Familiarization with good laboratory practices, data presentation, thesis writing etc.
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2. Course name: M.Sc. (Microbiology)

Semester	Paper Code and Title	Course Outcome
I	Biochemistry (IS1)	<ol style="list-style-type: none"> 1. Theoretical knowledge of various topics as per the syllabus 2. Exhaustive study of enzyme kinetics and bio-molecules, different metabolic pathways. 3. Familiarization with Bioenergetics concepts, generation of ATP 4. Experimentation related to enzyme kinetics, protein/sugar/lipid estimation using different methods, titrations etc.
I	Cell & Developmental Biology (IS2)	<ol style="list-style-type: none"> 1. Study of cell theory, Cell organelles, Ultrastructure, Roles of cell organelles. 2. Exhaustive study of Cell Signaling pathways, secondary messengers etc 3. Understanding of Developmental biology: Stem cell and cancer, Differentiation in plant tissue 4. Familiarization with methods of cell-study, various forms of Microscopy, staining for microscopy etc.
I	Molecular Biology (IS3)	<ol style="list-style-type: none"> 1. Understanding of Genome organization, Development of basic concepts in DNA/RNA structure, Replication, Repair & Recombination. 2. Knowledge of transcription and translation in prokaryotic and eukaryotic system. 3. Development of concepts of Oncogenesis, oncogenes and tumor suppressor genes. 4. Hands on training on DNA & RNA isolation by

		different techniques; plasmid isolation, transformation, Electrophoresis, quality check of Nucleic acids, restriction digestion, PCR, RFLP etc
I	Microbiology and Industrial Applications (IS4)	<ol style="list-style-type: none"> 1. Theoretical knowledge of microbial diversity & systematics, Microbial growth and physiology; Study of size, shape and growth pattern, nutrition type of microbes. 2. Experimental knowledge of Sterilization, disinfection, safety in microbiological laboratory. Preparation of media, Isolation and maintenance of organisms by plating, Streaking and Serial dilution methods, Storage of microorganisms, Gram Staining and enumeration of microorganisms. 3. Familiarization of assays related to antibiotics production and demonstration of antibiotic resistance
I	Biostatistics and Computer Applications (IS5)	<ol style="list-style-type: none"> 1. Comprehensive study of various topics including Data representation methods, measures of central tendency, variance 2. Practical knowledge of application of correlation and regression analysis, test of significance: F and t tests, Chi square test etc. 3. Study on sigma plotter, null hypothesis, Bioinformatic methods, Basic idea of computer languages 4. Familiarization with biological databases, sequence, structure and strain database, Secondary and sequence analysis of DNA, RNA and proteins
II	Bacterial Metabolism (2SM1)	<ol style="list-style-type: none"> 1. Theoretical knowledge of various topics as per the syllabus including detailed study of metabolic pathways, metabolic pathways involved in the release and dissimilation of substrates by heterotrophs and autotrophs etc 2. Concept building related to thermodynamic considerations of biological reactions, fermentation specific to various microbes, biochemistry of xenobiotics degradation etc. 3. Study of Fixation of molecular nitrogen and regulation, Biochemistry of methanogenesis and

		Regulation: enzyme synthesis and enzyme activity
II	Microbiological Techniques (2SM2)	<ol style="list-style-type: none"> 1. Knowledge of various topics including Microbiological laboratory safety precautions, Microscopy; Preparation of culture media; Isolation of pure microbial flora from natural and extreme environments and Biochemical characterization of bacteria etc. 2. Practical knowledge of basic microbiological techniques including familiarization with equipments used in Microbiological laboratory, lab safety aspects, staining techniques and their applications, culture techniques, isolation of pure microbial flora from natural and extreme environments and biochemical characterization of bacteria etc. 3. Additional experimental knowledge of Biochemical characterization of bacteria-BIOLOG plate method, carbohydrate fermentation, catalase, peroxidase, indole, methyl red, vogus-prausker, citrate utilization test (IMViC), Nitrate Reduction Test etc.
II	Analytical Techniques (2S2)	<ol style="list-style-type: none"> 1. Concept building in various topics including: Spectroscopy, chromatography, electrophoresis, centrifugation and their different variants 2. Practical knowledge of Chromatographic techniques, Spectroscopy techniques, protein isolation, quantitative and qualitative estimations of biomolecules 3. Development of understanding on Radioactivity, Radioisotopes and their uses in biology, measurement of radioactivity etc. 4. Theoretical basic concept building in Protein crystallization; Enzyme and cell immobilization techniques
II	Genetic Engineering (2S3)	<ol style="list-style-type: none"> 1. Elaborated structure and properties of genetic material; Restriction enzymes and other enzymes related to genetic manipulation. 2. Theoretical knowledge of advance techniques like, FISH, EMSA, CHIP etc. 3. Introduction to Cloning vectors, cloning methodologies, PCR and its applications; DNA

		<p>sequencing</p> <p>4. Hands-on experience in genomic DNA isolation, Restriction digestion, gel-purification, ligation, transformation, induction of recombinant protein synthesis, protein purification etc etc.</p>
II	Molecular Genetics (2S4)	<p>1. Theoretical knowledge of various topics of classical and modern genetics including: useful bacterial phenotypes, mutations, mutagenesis, transformation, conjugation and transduction.</p> <p>2. Familiarization with concepts of Mendelian and non-Mendelian genetics, including: genetic diseases, human pedigrees, x-linked inheritance, Mitochondrial inheritance, genomic imprinting, behavioral traits etc</p> <p>3. Study of molecular genetics of Lambda phage, lytic/lysogenic cycles. Population genetics, migration etc.</p>
III	Applied Microbiology (3SM1)	<p>1. Basic concept building related to Scope and importance of microbiology as applied to environment and industry, Petroleum and mining microbiology, Biopesticides and Microbiology of paints, films, pharmaceuticals etc</p> <p>2. Familiarization with the concept of Environmental quality; Biodegradation of waste and pollutants; (i) solid waste disposal, sanitary, landfills and composting (ii) Treatment of liquid waste, sewage treatment, (iii) treatment and safety of water supply etc.</p> <p>3. Knowledge of Microbial deterioration of cotton, jute, coir, wool, leather and wood and methods of preservation, Microbiology of biogas generation; Soil fertility and management of agricultural soil: soil microflora and organic matter decomposition, rhizosphere, Soil-plant-microbe interactions etc.</p>
III	Environmental Biochemistry & Biotechnology (3S2)	<p>1. Theoretical knowledge of Environment; Basic concepts; Resources; Eco system: plants, animals, microbes; Ecosystem management; Pollution, Renewable resources; Sustainability; Microbiology of degradation and decay.</p> <p>2. Study of role of biotechnological techniques in</p>

		<p>environment protection. Waste water collection; control and management; Waste water treatment; Sewage treatment through chemical, microbial and biotech techniques</p> <p>3. Concept building in alternate energy sources: Biomass as source of energy; Bioreactors; Rural biotechnology; Biocomposting; Biofertilizers; Vermiculture; Organic farming; Bio-mineralization; Biofuel etc.</p>
III	Animal Biotechnology (3S3)	<p>1. Theoretical knowledge of various topics as per the syllabus including basic cell culture techniques; Primary culture, secondary culture; Continuous cell lines; Suspension cultures; Transfection, pleuripotency, stem cells etc</p> <p>2. Study of various approaches related to vaccine production, disease diagnostic assays and many other assays involved in animal health management.</p> <p>3. Concept building in animal reproductive biology, Animal genomics and DNA forensics: Embryo transfer; Micromanipulation of animal embryos; Transgenic animal technology; RFLP, RAPD, proteomics, metabolomics; DNA Barcoding; Detection of adulteration in meat using DNA based methods; microbial forensics etc.</p>
III	Immunology & Immunotechnology (3S5)	<p>1. Theoretical knowledge of various topics including, antigens, antibodies, adaptive and innate immunity, organs and cells of immune system etc</p> <p>2. Hands on training on advanced immunological techniques viz., ELISA and its variants, western blotting, immunodiffusion methods, immunoelectrophoresis, determination of blood groups etc.</p> <p>3. Idea of Immune responses generated by Lymphocytes, Antigen-Antibody interactions.</p> <p>4. Vaccine technology and Clinical immunology: Immunity against Bacteria, viral, fungal and parasitic infections; Tumor immunology; DNA and protein based vaccines, plant-based vaccines, reverse vaccinology; Peptide vaccines, conjugate vaccines; Hybridoma etc.</p>

III	Molecular Virology (3S6)	<ol style="list-style-type: none"> 1. Knowledge of genome organization of different viruses e.g. Rabies, HIV, Hepatitis etc. and pathologies associated with their infection in various hosts. 2. Development of anti-virals, anti-viral host immunity, vaccinations against viruses etc. 3. Study of plant viruses: CaMV, TMV, CTV, RDV etc; their structure, genome organization and associated diseases. 4. Familiarization with Methods to study plant viruses; Infectivity assays – Sap transmission, insect vector transmission, agroinfection (using Agrobacterium); serological methods etc.
IV	Project/Thesis work	<ol style="list-style-type: none"> 1. Students as per their choice and collaboration options available with the department carry out their dissertation work in different research institutes all across the nation having MOUs with the department, or within the department. 2. An overall study on the concerned plant/animal/microbial system addressing any of relevant and pursuable scientific problems. 3. Familiarization with good laboratory practices, data presentation, thesis writing etc.

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Vision—The vision of the department is to impart a quality based theoretical and applied knowledge of economics striving for the overall development of the students as well as nurturing future researchers and specialists in Economics. The department also aims at conducting research on national level with special focus on regional socio- economic problems for inclusive development.

Mission—The mission of the Department of Economics at Kumaun University is -

- To prepare students for acquiring appropriate knowledge in the field of global, national and local economic issues, so that they can enhance their employability and entrepreneurship.
- To undertake quality research for regional development in the field of Economics.
- To develop environment for promoting research activities.
- To stimulate the academic environment by promoting quality teaching- learning and research.
- Engagement of faculty in research to create and disseminate new knowledge, develop quality teaching skills and actively serve the institution and community by maintaining high professional standards.

Programme Educational Objectives (PEOs) – The Program Educational Objectives (PEOs) for the Economics program are:

- To develop the students with a thorough knowledge of economics. They will have in-depth understanding of economics by the means of theoretical and empirical constructs.
- Development in their chosen profession or making progress towards higher degree in the field of economics.
- To promote active members who are ready to serve the society locally and globally through sustainable development.
- To apply economics knowledge in identifying and addressing the societal problems.
- To develop capabilities in students to independently conduct theoretical and applied research in the relevant field.

Program Outcomes (PO) –

- Students will have a well-founded knowledge in economics.
- The students will be able to understand the functioning of a complicated modern economic system.
- The students will have an opportunity to focus on various issues of the society in the field of economics.
- The students with a well-resourced learning environment in economics can serve the society as a professional.

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- The students will be able to interact with the theoretical and quantitative aspects of economics for better understanding and implementation.
- The structured curricula will support the academic development of students.
- The students will be able to decide the use of resources on an individual and collective basis.
- The study of economics will also provide valuable knowledge for making decisions in everyday life.

Programme Specific Outcomes (PSOs) –

- The students will be able to explain the contribution of economics to the analysis of non-market social issues.
- The students will develop the ability to explain core economic terms, concepts, and theories.
- The students will be able to demonstrate the ability to employ the “economic way of thinking.”
- The students will be able to recognize the role of ethical values in economic decisions
- The students will demonstrate computer proficiency within economics.
- The study of economics will create student’s ability to suggest the various economic problems in society.
- The study of economics will develop ability to pinpoint and understand the past and present economic conditions of the country.
- The study of economics makes familiarity with the knowledge and application for the formulation of policies and planning.
- The study of economics develops a scholar that how societies allocate their scarce resources through developing conceptual models and rigorous statistical analysis to investigate the effects and changes.
- The study of economics also provides valuable and innovative knowledge to handle daily life problems and making effective decisions to resolve them.
- Studying economics as a subject enable the learners to build up their skills as a professional in the field of economics as an economist, policy & planning maker, financial analyst etc.
- Studying economics as a subject will help in understanding the efficiency and equity implications of market interference also including various government policies.

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- **Course Outcome (CO)** –The department runs degree course at Graduate and Post-graduate level and in this section the programme outcome for both levels is given separately.

Post Graduate Level Course (Master of Arts in Economics) CBCS Pattern

The CBCS pattern is divided in four semesters. Semester I & II comprises of five Core papers. Semester III comprises two core paper's along with Dissertation, Two Elective paper & One Open Elective Paper. Semester IV comprises One Core paper along with viva-voce, three elective papers and one Open elective paper.

[Semester level – I & II]

Advanced Microeconomics (1st and 2nd Semester)

On success completion of the course the students will be able to understand –

- Understand Concept of equilibrium and economic model in economics.
- Understand Theory of consumer behaviour.
- Understanding the production and theory of cost in long and short period.
- Understanding the firm and various theories of maximisation.
- Understanding General equilibrium analysis.
- To understand the various type of markets and product pricing.
- Understanding the pricing of factors in market and concept of Welfare in economics through various theories.

Public Finance (1st and 2nd Semester)

On success completion of the course the students will be able to understand –

- Understand the principle of Maximum Social Advantage, Major Fiscal Functions and Functional and activating finance.
- Attain the advantages and knowledge of public investments and other government expenditures.
- Understand the possible burden, benefits and distribution of various types of taxes among various classes of people and impact of taxes. Incidence of taxes under

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various markets and Indian tax system.

- Understanding the needs of Public debt from all various sources to meet the requirement of an economy and welfare schemes.
- Understanding the Fiscal policies and its objectives especially in a developing economy.
- Understanding the process of preparation, presentation and execution of budget of Union government.
- Understanding the Deficit financing and reports of the last finance commission.

International Economics (1st and 2nd Semester)

On success completion of the course the students will be able to understand –

- Identify the basic difference between inter-regional and international trade, various concepts of trade through international trade theories.
- Show the gains of international trade for an economy and terms of trades that how they are having importance in an economy.
- To understand the trade policy of Free Trade and Protection and to know the interventions in an economy.
- Understanding the functioning bodies and their objectives at international level for trade between the countries - GATT, WTO.

History of Economic Thought (1st Semester)

On success completion of the course the students will be able to develop a chronological understanding of the development of economic thoughts (from classical to modern thoughts) which were developed in various schools of thought in different environments including with special section to understand Indian Economic Thoughts.

Quantitative Techniques in Economics (1st Semester)

On success completion of the course the students will be able to understand –

- To understand the scope, importance and limitations of Quantitative methods.
- Demonstrate the rules of Measure of Central tendency, Dispersion, Concept of Normal Distribution, Measures of Kurtosis and Skewness.
- Explaining the rules for calculating derivatives and calculating inter-relationship among total, marginal and average cost and revenue analysis. Calculating Maxima and Minima and optimal level of production of a firm.
- To understand the Elementary concepts of Linear Programming.
- Illustrate matrix operation and using Cramer rule to solve system of equations.
- Demonstrate the rules for calculating integration and describing the

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importance and application of integration in economics.

- Explain the rules for calculating Correlation and Regression to solve and predict for data analysis.
- Demonstrate the basic concept of probability with various laws and understanding use of Index Numbers for solving various economic problems.

Indian Economic Development and Policy (2nd Semester)

On success completion of the course the students will be able to understand –

- Develop ideas for the basic concept of Indian Economy and Demographic profile of Indian economy.
- Understand the importance of Human Resource in an economy and concept of Poverty and inequality in Indian environment.
- Understand the planning part of economy with centralised and decentralised institutions as well as magnitude of regional imbalances and regional planning in India.
- Demonstrating the role of agriculture in Indian economy and various food security schemes and Public Distribution System (PDS). Agriculture marketing and its structure.
- Understanding the Industrial structure of Indian economy in public and private system. Structure and functioning of Small and Cottage Industries in India.
- Understanding the globalization and its impact on Indian economy, effect of Foreign Direct Investment in economy and Information technology Industry in Indian environment.

Research Methodology (2nd Semester)

On success completion of the course the students will be able to understand –

- To understand the methods for social investigation and social research selection, research methods and procedures, field study and field experiences to develop the skills for a good researcher.
- To understand the theory to research design and tools.

Semester III

Macroeconomics - I

On success completion of the course the students will be able to understand –

- Understanding and measuring the National income.

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- Understanding the concept and type of macroeconomics and importance of Keynesian economic theory in market.
- Understanding the Saving and Investment functions with concept of Multiplier and accelerator.

Economics of Growth and Development

On success completion of the course the students will be able to understand –

- To understand the concept of economic growth and development as well as indices of development and quality of life indices.
- To understand the classical and partial theories of growth models of dual economy which are given at different time for growth and development of an economy.

Dissertation- To develop research insights in the students

Elective Papers (Two papers will be chosen by the students)

Labour Economics (elective)

On success completion of the course the students will be able to understand –

- Understanding of nature and characteristics of labour market with special reference to Indian Labour Market.
- They will understand the recruiting methods followed by industries to recruit the industrial labour.
- To know the wage payment techniques and concept of wages in the industry environment as well as the determination of wages on various sectors (Rural-Urban, Organised-Unorganised).

Advanced Statistics (elective)

On success completion of the course the students will be able to understand –

- They will enable to describe and discuss the key terminology, concepts tools and techniques used in statistical analysis of economic variables and attributes.
- Understand and critically discuss the process from statistical data collection to interpretation of data using analytical tools.
- Able to solve a range of problems using the techniques covered.

Agricultural Economics (elective)

On success completion of the course the students will be able to –

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- Sensitize the overall development and engine of growth in agriculture.
- Learn and identify the opportunities in those flourishing sectors such as horticulture, fishing and agro based industries.
- To understand the concept of organic farming, sustainable farming, livestock energy as well as the technological change in agriculture sector.
- Make them aware of the land distribution, tenure and farming system and the policies which were developed for land reforms in Indian agriculture environment.
- Gain knowledge of the rural unemployment, rural labour supply and agriculture wage along with various poverty eradication programmes in country.

Open Elective Paper (for students of other streams)

Indian Economy (open elective)

On success completion of the course the students will be able to -

- Develop ideas for the basic concept of Indian Economy
- Understand the importance of Human Resource in an economy and concept of Poverty and inequality in Indian environment.
- Understand the planning part of economy with centralised and decentralised institutions as well as magnitude of regional imbalances and regional planning in India
- Understand the Industrial structure of Indian economy in public and private system.

Semester IV

Macroeconomics - II

On success completion of the course the students will be able to understand –

- Understand the various concepts of money and role of banks.
- Understanding the concept of general equilibrium and types of market.
- Understanding the theories of trade cycle of various economists.

Viva-voce examination- Based on the dissertation submitted in 3rd semester

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Elective Papers

Industrial Economics

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

- This will help students to study the firms, industries and markets.
- The paper will provide knowledge to understand theory, models, methods and concepts which explain the behaviour and functioning of industries.
- This also gives insight into how the firms organise their activities, as well as considering their motivation.
- This will develop that how industrial firms organise their activities as well as considering their motivation.

Financial Institutions and Markets

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

- Functions of financial markets and intermediary institutions
- The structure and objectives of the financial market
- The structure of financial market and the contents of financial assets
- Basic concepts, functions and tools of the financial market: securities, currency, loans, precious metals and precious stones
- Understand the challenges of uncertain environment of financial markets, assess them and take appropriate financial and investment decisions.

Demography

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

- The students will understand and aware to know the importance of population in economic development.
- To understand various theories explaining the population growth in an economy.
- The various demographic techniques also enable student to their analytic approach towards qualitative and quantitative aspects and characteristics of population.

Economic Systems

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

- Students will be able to understand the links between household behavior and the economic models of demand.

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- It will also help in understanding the efficiency and equity implications of market interference, including government policy.

Open Elective Paper (for students of other streams)

Economy of Uttarakhand

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

- Develop ideas for the basic concept of Economy of Uttarakhand
- Understand the importance of Human Resource in economy of Uttarakhand and concept of migration and inequality in rural areas.
- Understand the planning part of economy as well as magnitude of regional imbalances and regional planning in India
- Understand the Industrial structure of Uttarakhand economy.

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II –Graduate Level Course (Bachelor of Arts in Economics)

From Semester I to VI the course comprises two compulsory papers in each semester with maximum marks 75 (Written Paper M.M. 55 + Assignment M.M.20) for B. A. Students.

Note: The paper can be opted by B.Sc. degree students and the number pattern for B.Sc. degree is with maximum marks (Written Paper M.M. + Assignment M.M)

[Semester level – I &II]

Microeconomics I & II

On success completion of the course the students will be able to understand –

- The behaviour of individuals and small organizations with the help of various theories developed in respective field.
- It will result in equipping the students with the various aspects of consumer behaviour and demand analysis, production theory, cost theory, various markets as well as the equilibrium of a firm in modern market framework.

Basic Quantitative Technique for Economics I& II

On success completion of the course the students will be able to understand –

- To understand the economic problems and theories clearly quantitative technique (Mathematical, Statistical and Programming Techniques) is an essential part and this paper is designed to understand the student in this direction.

[Semester level – III &IV]

Macroeconomics& Public Finance I & II

On success completion of the course the students will be able to understand –

- To make students familiar with the basic theoretical framework underlying in the field of macroeconomics and also aware students to study the aggregates and to provide overall idea about national income, economic policies and its implications.

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- This will help them to understand and analyzing the impact of public finance on the allocation of resources and the distribution of income and analysis of public expenditure, taxation, budgetary procedures & debt issues in economy.

Money, Banking and International Trade I & II

On success completion of the course the students will be able to understand –

- This will help to understand various concepts of money and money substitutes in economy.
- Able to understand various theories of money, inflation and banking system in an economy (Central & Commercial Banks).
- The course is helpful to understand the composition, direction and consequences of international trade.

[Semester level – V & VI]

Problem and Prospects of Indian Economy I & II

On success completion of the course the students will be able to understand –

- It will help in developing the structure of Indian economy through various pillars of economy and policies framed to run the economy.
- As a part also help in understanding the structure and policies of Uttarakhand's economy as a part of regional economy.
- It acquaints students with latest data and enhancing their analytical skills.
- They will be able to understand the landscape of Indian Economy and Uttarakhand's Economy.

History of Economic Thought I & II

On success completion of the course the students will be able to understand –

- This will develop a chronological understanding of the development of economic thoughts (from classical to modern) which were developed in various schools of thought in different environment.

Department of English, Kumaun University, Nainital

**B. A. First Semester
English Language
(Foundation Course)**

Maximum Marks: 100 (including 30 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to effectively communicate in both orally and verbally in English.
2. The course shall enable the students to use chaste language as they shall learn the basic principles of English grammar and translation from Hindi to English and vice-versa.
3. The course shall enable the students to write précis, comprehension, dialogue writing and expansion of an idea besides equipping them with presentation skills and vocabulary.

**B. A. Second Semester
(English Language)
Foundation Course**

Maximum Marks: 100 (including 30 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to effectively communicate in both orally and verbally in English.
 2. The course shall enable the students to use chaste language as they shall learn the basic principles of English grammar.
 3. The course shall enable the students to write essay, letter, and application and draft bio-data, report, notice, agenda and minutes.
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**B. A. First Semester
(English Literature)
Paper-I: Prose till 18th Century**

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of English prose till eighteenth century through a close reading of the select essays of the representative prose writers of the period.
2. It shall acquaint the students to the political, economic, social and intellectual background so as to enable them to study the texts as representatives of the age.

Paper-II: Elizabethan Drama

Learning Outcome:

1. The course shall acquaint the students with the major trends in Elizabethan drama through a close study of William Shakespeare's *Macbeth* and *Twelfth Night*.
2. It shall develop in the students the ability to interpret, analyse and evaluate both comedy and tragedy.

**B. A. Second Semester
(English Literature)**

Paper-I: Poetry till 18th Century

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of English poetry till eighteenth century through a close reading of the select poems of the representative poets of the period.
2. It shall introduce the students to the political, economic, social and intellectual background so as to enable them to study the poems as representatives of the age.

Paper-II: Eighteenth Century Drama

Learning Outcome:

1. The course shall acquaint the students with the major trends in eighteenth century English drama through a close reading of Richard Brinsley Sheridan's *The Rivals* and Oliver Goldsmith's *She Stoops to Conquer*.



2. It shall develop in the students the ability to interpret, analyse and evaluate plays in the perspective of literary history and theory.

**B. A. Third Semester
(English Literature)
Paper-I: 19th Century Poetry**

Learning Outcome:

1. The course shall acquaint the students with the most significant English poets of nineteenth century through a close study of their representative poems.
2. It shall enable the students with the characteristic features of the literature of the Romantic age and the problems of the Victorian age and their reflection in the literature of the period.
3. It shall train the student in the close reading of poems in the contexts of literary convention and history.

Paper-II: 19th Century Fiction

Learning Outcome:

1. The course shall acquaint the students with the major trends of the nineteenth century English fiction through a close study of Jane Austen's *Pride and Prejudice* and Thomas Hardy's *The Mayor of Caterbridge* which are representative of the respective age and the novelist.
2. It shall develop in the students the ability to interpret, analyse and evaluate works of fiction in the perspective of literary history and theory.



**B. A. Fourth Semester
(English Literature)**

Paper-I: 19th and 20th Century English Prose

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of English prose in the nineteenth and twentieth century through a close study of the select essays of the representative prose writers of the period.
2. It shall introduce the students to the political, economic, social and intellectual background so as to enable them to study the texts as representatives of the age.

Paper-II: Indian English Fiction

Learning Outcome:

1. The course shall acquaint the students with the major trends in Indian English fiction through a close study of R. K. Narayan's *The Guide* and Mulk Raj Anand's *Untouchable* which are representative of the respective age and the novelist.
2. It shall develop in the students the ability to interpret, analyse and evaluate works of fiction in the perspective of Indian literary history and theory.

**B. A. Fifth Semester
(English Literature)**

Paper-I: 20th Century Poetry

Learning Outcome:

1. The course shall acquaint the students with the most significant English poets of twentieth century through a close study of their representative poems.
2. It shall train the student in the close reading of poems in the contexts of literary convention and history.

Paper-II: 19th and Early 20th Century Drama

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of the nineteenth and early twentieth



century English drama through a close study G. B. Shaw's *Arms and the Man* and J. M. Synge's *Riders to the Sea*.

**B. A. Sixth Semester
(English Literature)
Paper-I: American and Indian English Poetry**

Learning Outcome:

1. The course shall enable the students to understand the historical movements and the cultural traits found in American and Indian English Poetry through a close study of the poems of the representative poets of America and India.

Paper-II: Modern English Drama and Fiction

Learning Outcome:

1. The course shall acquaint the students with the major trends in modern English drama and fiction through a close study of Harold Pinter's *The Caretaker* and George Orwell's *Animal Farm*.
2. It shall develop in the students the ability to interpret, analyse and evaluate works of drama and fiction in the perspective of literary history and theory.



Department of English, Kumaun University, Nainital

M. A. (English) First Semester

Paper I: Poetry till 1798

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the evolution, growth and trends of English poetry till 1798 through a close reading of the select poems of the representative poets of the period.
2. The students shall become trained in the close reading of poems in the contexts of literary tradition and history.

Paper II: English Drama before 20th Century

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the evolution, growth and major trends of English drama before twentieth century through a close study of the plays of the representative playwrights of the period.
2. It shall develop in the students the ability to interpret, analyse and evaluate plays in the perspective of literary history and theory.

Paper III: English Fiction before 20th Century

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the evolution, growth and major trends of English fiction before twentieth century through a close study of the representative novels of the major novelists of the age.



2. It shall develop in the students the ability to interpret, analyse and evaluate works of fiction in the perspective of literary history and theory.

Paper IV: 19th Century English Poetry

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the most significant poets of nineteenth century through a close study of their representative poems.
2. It shall enable the students with the characteristic features of the literature of the Romantic age and the problems of the Victorian age and their reflection in the literature of the period.
3. It shall train the student in the close reading of poems in the contexts of literary convention and history.

M. A. (English) Second Semester

Paper I: Non-Fictional Prose till 19th Century

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the evolution, growth and trends of Non-Fictional English prose till nineteenth century through a close reading of the select essays of the representative prose writers of the period.
2. It shall introduce the students to the political, economic, social and intellectual background so as to enable them to study the works as representatives of the age.

Paper II: 20th Century English Drama



Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of twentieth century English drama through a close study of the plays of the representative playwrights of the period.
2. It shall introduce the students to the political, economic, social and intellectual background so as to enable them to study the works as representatives of the age.

Paper III: 20th Century English Fiction

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the major English novelists of twentieth century through a close study of the novels representative of the age and the novelist.
2. It shall develop in the students the ability to interpret, analyse and evaluate works of fiction in the perspective of literary history and theory.

Paper IV: 20th Century English Poetry

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the most significant poets of twentieth century through a close study of their representative poems.
2. It shall enable the students to become familiar with the characteristic features of the literature of twentieth century and its reflection in the poetry of the period.
3. It shall train the student in the close reading of poems in the contexts of literary convention and history.



M.A. (English) Third Semester

Paper I: Literary Criticism and Theory- till 19th Century

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the evolution, growth and trends of literary criticism and theory from Aristotle till nineteenth century through a close reading of the select texts of the representative critics of the period.
2. It shall acquaint the students with the different schools and principles of literary criticism and help them to appreciate and evaluate literary texts.

Paper II: 20th Century Non-Fictional Prose

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the literary works of the prose writers of the period through a close study of their representative non-fictional prose writings.
2. It shall introduce the students to the political, economic, social and intellectual background so as to enable them to study the texts as representatives of the age.

Paper III: Indian Literature in English till 1960

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:



1. The course shall enable the students to understand the historical movements and the cultural traits found in Indian English Literature.

Paper IV: Option 1: American Literature till Second World War

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the history of American literature till Second World War through a close study of the representative texts of major American authors.

Paper IV: Option 2: Pre-independence Indian Literature in Translation

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to define the concept of “Indian Literature” with the help of some representative texts from various Indian languages.
2. It shall enable the students to look in to these texts as a holistic concept of Indianness.
3. It shall enable the students with a comparative methodology dealing with genre specific problems such as form, realism, symbolism etc.

Paper IV: Option 3: General Linguistics and Phonetics

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall acquaint the students with the rudiments of linguistics and the nuances of the English language through a study of phonology, morphology, syntax, semantics and pragmatics.
2. It shall enable the students to develop their communication competence and writing skill.

M. A. (English) Fourth Semester

Paper I: 20th Century Literary Criticism and Theory-

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with literary criticism and theory in the twentieth century through a close reading of some representative texts.

Paper II: Indian Literature in English after 1960

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to understand the historical movements and the cultural traits found in Indian English Literature after 1960.

Paper III: Option 1: Post-second World War American Literature

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to become familiar with the growth and trends of Post-second World War American literature

through a close reading of the select texts of the major writers of the period.

Paper III: Option 2: Post-independence Indian Literature in Translation

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall build up in the students a comparative perspective in Pan-Indian terms on the nature and function of modern Indian Literature in regional literary traditions.

Paper III: Option 3: Applied Linguistics and Stylistics

Max. Marks: 100 (including 25 marks of internal assessment)

Learning Outcome:

1. The course shall enable the students to analyse and interpret prose and poetry texts from the view point of phonology, morphology, syntax and lexis. It will be in relation to actual texts.
2. It shall give the students a fair knowledge of phonetics and improve their listening comprehension, spoken English etc. and shall enable them to use a pronouncing dictionary.

Paper IV: Viva Voce

Max. Marks: 100

Learning Outcome:

1. The course shall enable the students to acquire a deep knowledge of the entire syllabus of M. A. programme.
2. It shall enable the students to develop their communication competence.
3. It shall enable the students to face interviews with confidence for jobs and other purposes.



Department of Home Science

Master of Arts in Home Science

Programme Mission:

Home science has a vital role to play in increasing the capacity of the family and the community. It is an interdisciplinary field that is related to both the fields of arts and science. M.A Home Science has been innovatively designed to enable students to acquire knowledge in the field of Foods and Nutrition, Family Resource Management and Interior Design, Human development, Textiles and Clothing and Home Science Extension. The curriculum has an integrated approach of combining theory, practical and field work.

Programme Objectives:

1. To develop the capabilities and knowledge of students in the areas of

- Food science, Principles of Nutrition and Food Processing
- Food service management
- Family and community science
- Family economics and financial management
- Textile design, fashion illustrations and clothing
- Extension and communication
- Human Development

2. To develop relevant skills and make students efficient in academics, research, industry and community service in the field of Home Science

3. To foster competence and excellence in students by enhancing communication and leadership skills

Programme Outcomes:

1. **Environment and sustainability:** critically evaluate impact of household and industrial practices on environment. Appreciate use of sustainable practices for improved physical, emotional, social, psychological environment at micro/macro level.
2. **Home Science and Society:** apply knowledge and competencies developed as graduates to impart knowledge, identify, analyze and address family and societal issues to improve quality of life of individual, family and societal issues to improve quality of life of individual, family and society as a whole, also covering marginalized and vulnerable groups of society.
3. **Learning and Conceptual Understanding:** have knowledge and holistic understanding of the core courses related to Home Science including Human Development, Foods and Nutrition, Clothing and Textiles, Home Management, Extension Education and Communication and basic courses associated with Social Sciences, Biological sciences, Physical sciences, Technology and Management.

4. **Life Long Learning-** ability to reason out, learn and improve oneself in the changing dynamic scenario by strengthening the strength and weakening of weakness for sustainable developmental needs, technological changes, career requirements and new avenues.

5. **Leadership Skills:** Apply leadership skills, inspiring , taking responsibility, delegating tasks while working in a team, communicating with other teams, providing guidance to lesser skilled in various settings be it family, industry or institutions or carrying out research projects.
6. **Communication-** use soft skills for clear, accurate, unambiguous effective communication using verbal and non verbal skills at inter/ intra personal and professional level.

7. **Ethics and Integrity-** apply ethical practices while data collection, conducting experiments, involving human beings as well as animals, delivering professional capabilities.

8. **Planning Skills:** apply skills in designing, implementing, monitoring and valuating programmes effectively for individuals, family, community and for vulnerable groups of society

9. **Problem Solving**- solve problems concerning home, family and society for ensured physical and mental health in the changing socio economic scenario viz. dietary problems, behavioral problems, clothing problems, social problems by applying scientific methods, through critical thinking, assessing, analyzing, finding appropriate solutions and taking decisions.
10. **Practical Work**- provides opportunity to students to get acquainted with innovative research projects and develop skills to plan and undertake intervention projects.

M.A. Home Science
Semester Based Course Framework
Semester I
HMC-101 Family Economics

M.M. 100

Internal- 25

External- 75

Learning Outcome:

- Understanding daily issues and improving aspects of life that impacts individuals, families and community such as relationship, shelter, clothing and nutrition.
- Gain knowledge of income, saving and investment management in the changing socio economic environment
- Understand the role of consumer in the economy, consumer problems, education and empowerment
- Comprehend issues related to consumer protection, legislative measures and redressal mechanisms

Objectives:

- To familiarize the students with the changing socio economic environment and consumer behavior
- To strengthen the financial management practices of the students for wise consumer behavior
- To have an overview of the consumer problems, consumer movement and consumer protection.

M.A. Home Science
Semester Based Course Framework

Semester I

HMC-102 Research Methods and Statistics

M.M. 100

Internal- 25

External- 75

Learning Outcomes:

- Develop understanding on various kinds of research, objectives of doing research, research process, research design and sampling
- Basic knowledge on qualitative research techniques and quantitative data analysis
- Basic awareness of hypothesis testing

Objectives:

- To understand the significance of statistics and research methodology in home science research.
- To understand the types, tools and methods for research and develop the ability to construct data gathering instruments appropriate to the research design.
- To understand and apply the appropriate statistics technique for the measurements scale and design.

M.A. Home Science
Semester Based Course Framework
Semester I
HMC-103 Textile Science

M.M. 100

Internal- 25

External- 75

Learning Outcome:

After studying the above course, students will have ability to:

- Explain the properties of synthetic fibers
- Describe new development in the fiber manufacture
- Discuss yarn technology and yarn finishes

Objectives:

To acquaint the students about the chemical composition, properties and uses of synthetic fibers and advanced textile technology

M.A. Home Science
Semester Based Course Framework
Semester I
HMC-104 Food Science

M.M. 100

Internal- 25

External- 75

Learning Outcome:

Knowledge and understanding of:

- Food composition in the context of food quality and safety
- Food processing and food processing equipment
- Microbiological aspects of food quality and safety

Objective:

- To provide an understanding of composition of various foodstuffs
- Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking
- Enable students to use the theoretical knowledge in various applications and food preparations.

M.A. Home Science
Semester Based Course Framework
Semester II
HMC-201 Fashion Illustrations

M.M. 100

Internal- 50

External- 50

Learning Outcome

- Acquire the skill of sketching and jewellery designing
- They can work as fashion advisor
- Ability to explain fashion cycle
- Discuss anomalies of fashion
- Create design using designing elements

Objectives:

Focuses on design details, creation of styles and rendering techniques using the different media, pencils, pens, markers, charcoals, brushes, colors, papers.

M.A. Home Science

Semester Based Course Framework

Semester II

HMC-202 Community organization and Home Science Extension Education

M.M. 100

Internal- 25

External- 75

Learning Outcome:

- Students can understand
- Concepts of communication and communication process
- Use of new technologies of communication
- Tolls of communication
- The presentation using proper points

Objectives:

To enhance the understanding about the vital aspects of communication and uses of new technologies of communication

M.A. Home Science
Semester Based Course Framework
Semester II
HMC-203 Theories of Human Development

M.M. 100

Internal- 25

External- 75

Learning Outcome:

- On successful completion of the course the student will be able to:
- Describe a theory, need for theory, different perspectives and approaches
- Equipped with knowledge regarding general issues of different theories and their classification
- Design practical applications of different theories

Objective:

- Critically analyze theories in relation to various aspects of human development
- Understand the normal and abnormal conditions and gain a greater appreciation of developmental throughout life

M.A. Home Science
Semester Based Course Framework
Semester II
HMC-204 Human Physiology

M.M. 100

Internal- 25

External- 75

Learning Outcome:

- Understanding about the functioning of human biological systems
- Knowledge of interrelationship between different organs with each other
- Deep understanding about organ specific diseases and their causing elements

Objectives:

This paper will enable students to

- Advance their understanding of some of the relevant issues and topics of human physiology
- Understand the integrated function of all systems and grounding of nutritional science in physiology
- Understand the alterations of structure and function in various organs and systems in disease conditions

Semester III

HMC-301 Human Nutrition and Diet Therapy

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

It will enable students to understand the methods of assessment of nutritional status

Understand principles of diet therapy; know the methods of normal diet for therapeutic purpose and planning of diets in various disease conditions

Course outcomes – after completion of the course the student will be able to

- understand nutrients, their functions and metabolism Understand diet therapy and therapeutic modifications of normal diets
- Be familiar with different methods of assessment of nutritional status
- Understand principles of dietetic management in different disease conditions

Semester III

HMC-302 Communication Process

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To enable students understand the concept and process of communication.

To acquaint students with different communication aids and provide them skill in the use of communication methods and media.

To provide concept and understanding of formal / non formal education and adult education

To help understand the principles of Programme planning

Course outcomes – after completion of the course the student will be able to

- Understand communication process
- Be familiar with and be able to use different communication aids
- Differentiate between projected and non projected communication aids
- Differentiate between formal and non formal education
- Understand adult education
- understand the principles of Programme planning
- be acquainted with various government sponsored programs for family welfare

Semester III

HMC-303 Apparel Designing

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To develop skill in clothing construction

Course outcomes – after completion of the course the student will be able to

- Understand and develop skill in general construction techniques of garments
- Acquire basic skills and knowledge to make paper patterns by different methods
- Develop an understanding of pattern making techniques used in garment industry
- Create designs for apparels using construction details applying elements of arts and principles of designs

Semester III

HMC-304 Life Span Development I

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To enable students understand growth and development during prenatal period, infancy and childhood

To develop awareness of important aspects of development during prenatal period infancy and childhood and to understand the issues faced in these stages

To develop an understanding of parent child relationships, role of family, school and community in child development

Course outcomes – after completion of the course the student will be able to

- Gain knowledge of various aspects and concerns of development with special focus from conception to middle childhood stages
- Analyze and effectively deal with developmental and adjustment issues from prenatal period to childhood stages
- Understand parent child relationships, role of family, school and community in child development
- Appreciate the needs of exceptional children

Semester IV
HMC-401 Indian Embroidery and Textile

Max Marks – 100

(Internal -50 + External-50)

Course Objectives-

To provide students the knowledge of traditional textiles of India and acquaint them with their importance

To impart the techniques of embellishing household and clothing articles for consumer utility

Course outcomes – after completion of the course the student will be able to

- Understand traditional textiles of India
- Be able to identify and develop skill in various traditional embroidery styles
- Be acquainted with traditional Indian costumes of different states
- Able to use traditional embroideries in contemporary dresses and costumes

Semester IV
HMC-402 Housing and Interior Decoration

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To help students to gain knowledge about factors affecting the housing needs in India

Gain knowledge about interior decoration and principles of planning specific areas

Gain knowledge of furnishing and be able to choose furnishing material keeping financial considerations in mind

Course outcomes – after completion of the course the student will be able to

- Understand factors affecting the housing needs in India
- Role of government and local housing agencies in solving india's housing problem
- Be able to apply the skill of interior decoration in planning different spaces
- Choose appropriate furnishing material keeping in mind characteristics of room, family needs, style and financial considerations
- Understand furniture arrangements and styles
- Be familiar with functional and decorative accessories

Semester IV
HMC-403 Entrepreneurship Development

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To enable students to develop entrepreneurship skills

To understand the process and procedure of setting up small enterprise

Develop management skills for entrepreneurship development

Course outcomes – after completion of the course the student will be able to

- Develop entrepreneurship skills
- Be aware of entrepreneurial qualities
- Be aware of infrastructure and industrial support agencies
- Formulate small scale project
- Develop basic skills for the management of small enterprise

Semester IV
HMC-404 Community Nutrition and Public Health

Max Marks – 100

(Internal -25 + External-75)

Course Objectives-

To impart to the students awareness of the magnitude of nutritional problems and agencies working for their amelioration

To provide understanding of Nutrition education, National nutrition programmes, objectives and functions of national and international agencies working in the field of nutrition

To develop understanding of the methods of assessment of nutritional status and the concept of food security

Course outcomes – after completion of the course the student will be able to

- Understand about community nutrition and nutrition education
- Be aware of National nutrition programmes
- Be aware of objectives and functions of national and international agencies working in the field of nutrition
- Understand the concept of health and primary health care
- Understand the concept of food security,
- Understand about infection- its sources, prevention and control

Programme Educational Objectives (PEO)

The educational objectives of the geology program are to produce graduates who could pursue productive careers as eminent geologists engaged in continuous professional growth along their chosen career paths in academic as well as non-academic domains. This programme's main focus is on producing professionally qualified geologists capable of resolving intricate geological problems, ensuring optimal utilization of earth resources, and actively contribute in managing the geohazards.

Programme Outcomes (PO)

Outcomes of the university's geology programme are that the graduates in this subject acquire knowledge and skills to :

- (a) Use of scientific approaches in geological sciences,
- (b) To identify and solve geological problems.
- (c) To understand and resolve public issues in geological sciences.
- (d) Independently design and conduct experiments, analyze and interpret data.
- (e) Able to function as a part of multidisciplinary teams.
- (f) Able to do the work independently as well as collectively to formulate or design a system, process, or program to meet desired needs.
- (g) To communicate effectively
- (h) To understand the need for, and an ability to engage in life-long learning
- (i) To understand and adhere to high professional and ethical standards
- (j) Understand the importance of geological sciences in global economic, environmental and societal context.
- (k) Use the techniques, skills, and modern scientific and technical tools necessary for professional practice.
- (l) Have knowledge of contemporary issues.

DRAWING AND PAINTING DEPARTMENT



KUMAUN UNIVERSITY
SOBAN SINGH JEENA CAMPUS ALMORA

Vision of department

Motivate the students of drawing and painting towards self employment. Develop qualified and professional experts in multiple fields of drawing and painting. Enhance the knowledge about the use of drawing and painting in all disciplines of the present professional life and culture of society.

Mission of department

Provide the mode of employment to the students in field of drawing and painting and motivate them about the prosperity of our cultural diversity. Demonstrate skillful use of recent technological development in the field of drawing and painting. Realize them that Painting is most important and integral part of life it is a mode of expression which make the life beautiful. To encourage economic self reliance through thematic education so that the student in mentally competent to lead a worthy and confident life. Develop the ability of independent artist and art exhibition on a large scale along with a leading capacity which can serve the group of people which associated with them. Prepare students as young artist with morality spiritually empowered mind and responsible citizens of the nation. Aware them, about representation of the problem of our developing society and nation.

Drawing and Painting

Curriculum Structure

First Semester Examination, December, 2019
Second Semester Examination, April/May, 2020
Third Semester Examination, December, 2020
Fourth Semester Examination, April/May, 2021
Fifth Semester Examination, December, 2021
Sixth Semester Examination, April/May, 2022

Program Educational Objectives

The Program consists of Discipline/Core courses, and Foundation courses. The core courses Drawing and Painting. The Foundation courses are of two types-core and elective. These courses are designed in such a way that they help students in achieving their holistic personality comprehensive intellectual, moral, professional and aesthetic dimensions of human existence. It intends to dissolve all seeming binaries of life so that the students of Department can nurture a harmonious and holistic personality. It also develops a sense of ethical behavior, nationalism, appreciating Indian culture and art.

The main objectives of the program are:

- To acquaint students with complex textures of Indian culture and art.
- To develop students' wide understanding of and on the major concepts, thoughts, and ideas of drawing and painting.
- To hone students' critical, creative, liberal, innovative, and artistic thinking.
- To engage students in self-reflexivity and lifelong learning.
- To help students in integrating different aspects of physical, practical, aesthetic, moral and intellectual dimensions of educations to develop a holistic personality of each student.
- To nurture an effective citizen with a strong artistic value base and ethics.
- To familiarize students with environmental contexts, inclusivity, sustainable and aesthetically development.

Program Outcomes

PO1: Enrichment of Intellectual and Epistemic Tradition:

The program develops students' wide understanding of and on the major concepts, thoughts, and ideas of Drawing and Painting. It also enriches their analytical, critical, creative faculties.

PO2: Inculcation of Planning Abilities: The program hones effective planning abilities including time management, resource management, delegation skills and organizational skills of students which may develop their leadership qualities. It

also prepares students for implementing plans, organizing several cultural and academic activities, coordinating to meet deadlines.

PO3: Amelioration of Problem Solving Skills: The program prepares students to contextualize and to rationalize the principles of scientific enquiry, theoretical and philosophical thoughts, analytical and creative thinking for solving problems and making decision in the socio pragmatic realities of life. These problem solving skills are instrumental in finding, analyzing, evaluating and applying information systematically so that judicious decision could be made.

PO4: Appropriate Application of Methodological Tools: The program makes a candid attempt of familiarizing students with some relevant methodological tools which help them exploring the underlying ideas, thoughts, concepts and meanings in the available discourses of Drawing & Painting, art and aesthetics and medias etc.

PO5: Formation of Professional Identity: Education intends to develop not only the intellectual and epistemological textures of the inhabitants of the synchronic society but it also hones professionalism among the denizens. Thus, the program intends to develop professional identity among students.

PO6: Nurturing Ethics and *Dharma*: The vying competitiveness has developed a great sense of individuality, utilitarianism, and material competitiveness among students. They have impelled the people to ignore honesty, empathy, integrity, and ethical principles and therefore, people are not able to make any ethical interventions. The program therefore intends to nurture ethics and *dharma* among the denizens of the world.

PO7: Developing Communicative Competence: The program intends to develop grammatical and communicative competence among students and make them aware of the nature, form and function of language. The program therefore nurtures listening, writing, speaking and reading skills of students which allow them to communicate effectively in textual, personal and interpersonal contexts so that the discursive practices may be enriched and the trajectory of knowledge may get strengthened.

PO8: The knowledge, knower and Society: The program disseminates the fact the conception and distribution of knowledge in any form seems meaningless unless it is seen functioning in a society which is defined by the existence of human beings. The benefit of the common mass is always at the centre of all social, cultural, political, technological, and scientific innovations.

PO9: Environment and Sustainability: The unprecedented growth and development in the world on industry, technology, trade and commerce etc have damaged the balance between nature and culture, Environment, ecology and all natural resources have been exploited to such a level that many of them are exhausted. Looking at these miserable conditions, the program intends to prepare students to respond to some major issues of environment and sustainability.

PO10: Lifelong Learning: A culture is inseparably intertwined into the complexes of its intellectual tradition or the systems of knowledge. The intellectual tradition remains alive when the people communicate and engage themselves with some discursive practices.

Drawing and Painting

First Semester

BADP- 101 Fundamentals of Visual Art (Theory)

**Max Marks – 50
(Int. 15, Ext. 35)**

Learning Outcomes

- Know about basic Elements of Painting & creative Principal of Drawing & Painting
- Understand fundamentals and basic elements of Visual Art
- Co-relate art, nature and society in the Visual Art.
- Communicate through art works for the Visual Art.

BADP- 102 Drawing or Designs (Practical)

**Max Marks – 100
(Int. 30, Ext. 70)**

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

- Gain control over the uses of 2-Dimensional and 3-Dimensional Drawing & Design.
- Apply knowledge in the use of Nonliving and Living objects, subjects and mediums.
- Understand elements of art and its implementation in their art practices.
- Apply Knowledge in the simple and solid Geometrical forms of Drawing & Design.
- Use all Aspects and values of nonliving and living objects in the drawing & design.
- Appreciate own work of art and others.
- Identify new possibilities in their art works in drawing and Painting

Second Semester

BADP- 201 Creative Arts- Method and Material (Theory)

**Max Marks – 50
(Int. 15, Ext. 35)**

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

- Apply knowledge in the use of different mediums and Material.
- Understand principles of creative process use in the Drawing & Design.
- Explain the importance of visual art and its relevance with society and nature.
- Use proper medium method for painting work.

BADP- 202 Still Life (Practical)

Max Marks – 100
(Int. 30, Ext. 70)

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

- Recognize and draw variety of forms and shapes, their values, texture and chiaroscuro.
- Realize values of different objects and arrange them in making composition.
- Apply knowledge in the difference shape and sowing light and shade.
- Emphasize concepts and the application of various materials and aesthetic values.
- Apply knowledge of the object study (Still Life) in the natural colors.
- Explore and develop personal concepts regarding study from life.
- Cultivate several modes of artistic expression in study from life.
- Handle all the mediums according to requirements.

Third Semester

BADP- 301 Brief Introduction of Applied Art (Theory)

Max Marks – 50
(Int. 15, Ext. 35)

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

- Know the Applied art history and its existence.
- Understand the theory of applied art and its relation with art practices.
- Write, speak and communicate ideas critically.

BADP- 302 Anatomy & Poster Designing (Practical)

Max Marks – 100
(Int. 30, Ext. 70)

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

- Explore and develop personal concepts regarding study from life and poster designing.

- Cultivate several modes of artistic expression in study from Anatomy and Poster designing.
- Handle all the art mediums according to requirements.

Fourth Semester

BADP- 401 Environmental, Folk and Tribal Art (Theory)

Max Marks – 50
(Int. 15, Ext. 35)

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

- Know about Environmental, Folk and Tribal Art.
- Identify various Indian Folk and Tribal Art and their contribution in Indian art scenario.
- Ability to link Folk and Tribal Art theory with creative practices.
- Know about various methods of Environmental, Folk and Tribal Art.

BADP- 402 Portrait Painting (Practical)

Max Marks – 100
(Int. 30, Ext. 70)

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

- Make free hand structural drawings of human figure.
- Enrich knowledge about various poses of human figure
- Know about the importance of light & shades.
- Get acquainted with the handlings of various mediums used in life study.

Fifth Semester

BADP- 501 Indian Painting (Theory)

Max Marks – 50
(Int. 15, Ext. 35)

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

- Know the Indian art history and its existence.
- Understand the theory different era of Indian Painting and its relation with art practices.
- Know about Indian painting and sculpture.
- Identify various Indian artist and their contribution in Indian art scenario.
- Ability to link theory with creative practices.

BADP- 502 Landscape Painting (Practical)

Max Marks – 100

(Int. 30, Ext. 70)

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

- Know about history of Landscape Painting.
- Analyze own problem in Landscape painting and solve accordingly.
- Learn proper techniques to create a Landscape painting.
- Create aesthetic appeal in a Landscape painting.

Sixth Semester

BADP- 601 Art, Aesthetics and Appreciation (Theory)

Max Marks – 50

(Int. 15, Ext. 35)

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

- Understand about the Art, Aesthetics and Appreciation theory.
- Know about the visual and communication Art.
- Know about the Art Appreciation.
- Execute ideas of Art and Aesthetics.
- Know about the Theory of Indian Art and Aesthetics.
- Understand the Philosophy of Indian and Western Art.

BADP- 602 Composition or Mural (Practical)

Max Marks – 100

(Int. 30, Ext. 70)

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

- Know about the history of Mural Art (from ancient to contemporary).
- Understand the Mural Art types.
- Develop aesthetic knowledge about Mural Painting.
- Know subjects and materials used in Mural work.
- Identify the importance of Mural and above themes.
- Realize the aesthetic value of Composition and Mural work.
- Command of the Mural technical aspects of all processes covered.
- Conversant with multiple Composition and Mural printing processes
- Think critically, communicate clearly and work creatively in intellectual pursuit.
- Explore and develop personal concepts in creative expression in Composition and Mural.

DRAWING AND PAINTING DEPARTMENT



KUMAUN UNIVERSITY
SOBAN SINGH JEENA CAMPUS ALMORA

Master of Arts (Drawing and Painting)

Curriculum Structure

First Semester Examination, December-2019
Second Semester Examination, April/May-2020
Third Semester Examination, December-2020
Fourth Semester Examination, April/May-2021

Program Educational Objective

Postgraduate study in Drawing and Painting reflects the diversity of courses. Students will be encouraged to explore various methods with support from accomplished academic and technical staff. The P.G. course of the department is maintaining a balance of theoretical and historical context. Sketching and drawing is a fundamental concern of the department. Students are encouraged to explore Portrait, Figure drawing, Mural Painting at a high level by focusing on the connections between thinking, feeling, looking and making. Painting is also developed through experimentation with other art forms such as Print making, Media Exploration, Photography, Installation and all manner of object and image making. Analysis and actualization of the pleasure and beauty of painting in all its complexity is the heart of the area. Discussion and debate fuel and sharpen the students critical awareness of the nature of painting with in a contemporary art context and their ability to question the position of painting today. The wide range of creative activity and cultural experience of students makes for a rich and diverse studio culture to create a vibrant and stimulating working atmosphere. The curriculum has identified essential competencies in the respective areas for which practical and theoretical knowledge will be provided to the students specializing in academic and professional fields respectively. Students are sure to find an area that suits their expressive style. Rigorous study of art history across culture and time offers opportunities to consider multiple perspectives as well as providing a firm grounding for understanding that cultural context is a shaping force for all human

activity. Skillful execution are essential elements for generating change in the world. We believe that the studio arts provide an ideal venue for learning and practicing these critical skills. Ensuring that our students understand the applicability and transferability of the creative making process to all areas of life is a primary goal. The Visual Art Department has its own well equipped art studios in the Kala Mandir and Lalit Mandir building which support students development of artistic practice.

Portrait Painting and Life Drawing Studio.

Painting Studio.

Print Making Studio

Mural Painting Studio

The main objectives of the M.A. drawing and painting program are :

Aim and Objective:

- To learn Understanding with knowledge for overall informative truths and facts about Visual Arts providing core, elective and related skillful topics
- To practices with different mediums, arts forms to understand, capture and express the value of that particular for the Visual Communication
- To develop self style, compositions, creativity and skills as per the need of individuals, art,culture and society
- To Study and research of core, critical and historical visual arts and artists including local, folk and tribal arts
- To provide knowledge, study and research to students of other streams related to interdisplanery subjects in the field.
- To build for the professional and self employment in the society and education as well as helping expert to other art lovers/promoters

Core Course: Students learn with the help of basic learnt techniques of mediumsto create an image using any of the wide variety of advanced Dry and Wet techniques in different mediums of Drawings and Paintings. The use of applying pigment in a carrier or medium and a binding agent/glue on a two dimensional surfaces such a paper, canvas and a wall is learnt in painting.

Finally they learn maximum practicumto develop their own visual language and adequate theory of the subjects with further scope of research.

Elective Course: Each Mandatory Elective Course, step by step, in each semester will extend gradually depth study and experience with uses of various surfaces, spaces and mediums along with their techniques used by artists including history of Visual Arts. Designing, Graphics, Photography, Poster making and Clay modeling are also taught in this course.

General and Skill Enhancement Course: This course/papers help to students who have interest in visual art offering other streams in learning. They can understand the feeling of the subject and does whatever deems fit with their way of learning to earn self resources in employment generation for self and others.

To provide exemplary education in a stimulating environment with aesthetic sensibility. Develop and refine artistic techniques and methods in order to interpret, analyze and conceptualize art work.

To prepare competent educationists and professional artists of various levels for India.

To prepare globally recognized art educationists and artist.

To use innovative theoretical and methodological approaches to generate new approaches to the history of representation understood within broader socio-cultural perspectives.

To emphasizes the innovative practices and profound changes in the development of Visual Art.

To develop writing and speaking skill effectively regarding art criticism, art appreciation and aesthetics.

To create awareness in society about the effective and safe use of art materials and methods.

To develop gender-neutral attitudes and practices; respect for all races, nations, religions, cultures, languages and traditions through art creation.

Program Outcomes

PO 1 : Knowledge of Visual Art : Clearly communicate the content and context of their work visually, orally and in writing. Through creative process use a variety of brainstorming techniques to generate novel ideas of value to solve problems. Develop behavior such as curiosity, initiative and persistence that will help them engage with world in productive ways. Work independently or collectively to achieve stated goals .

PO 2 : Planning abilities : Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO 3 : Problem analysis: Utilize the principles of artistic enquiry, thinking analytically, clearly and critically, while solving problems and making decision during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

PO 4 : Modern tool usages : Learn, select, and apply appropriate methods and procedures, resources, and modern art-related computing tools with an understanding of the limitations.

PO 5 : Leadership skills : Understand and consider the human reaction to change, motivation issues, leadership and team building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizen or leadership roles when appropriate to facilitate improvement in aesthetic environment.

PO 6 : Professional Identity : Understand, analyze and communicate the value of their professional roles in society (e.g. Art educators, free lance artists, Art therapist, Art Critic, Art conservators, Art historians and Art directors etc.)

PO 7 : Ethics of Visual Arts : Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO 8 : Communication : Communicate effectively with the artist community and with society at large, such as, being able to comprehend and write effective, make effective presentations and documentation, and give and receive clear instructions.

PO 9 : Visual Art and society : Recognize and understand major monuments, artists, methods and theories and be able to asses the qualities of works of art in their historical and cultural settings apply reasoning informed by the contextual knowledge to assess societal, environmental, and legal issues and the consequent responsibilities relevant to the professional art practice. Sensible and balanced approach between social values and creative expression.

PO 10 : Environment and sustainability : Understand the impact of the professional artistic societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. Understand the social environmental, cultural and historical contributions and dimensions of the art.

PO 11 : Life- long learning : Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological and day-to-day changes in society.

First Semester

MADP- 101 Indian Painting (Theory - I)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know different phases of Indian art history and its stylistic changes.
- Familiar with art and praxis.
- Speak articulately and critically about Indian art history.
- Identify works of art, their artistic style and their Socio-Political and Cultural context.
- Understand formal elements and differentiate styles among cultures overtime.
- Analyze the influence of religion in the emergence of Medieval Period art.

- Analyze the formal, technical, stylistic, compositional, characteristics of works of Medieval Art.

MADP- 102 Art and Indian Aesthetics (Theory - II)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know the historical aspects of Indian Art and Aesthetics through its documented events and works of art as well as to develop the aesthetic sensibility.
- Understand the major Fundamental element of Indian Art and Aesthetics.
- Knowledge of the interrelations of Philosophy, Society, Morality, Symbol, Education, Communication, Ability etc. in the perspective of art
- Gain the knowledge of Indian Aesthetics with reference to Vedic and Puranic Literature.
- Explain the theory of Ras according to Natyashastra.
- Relate Aesthetics and its Philosophy.

MADP- 103 Portrait Drawing or Painting (Practical - I)

Max Marks – 100
(Int. 25, Ext. 75)

After the accomplishment of the course students will be able to:

- Know about the role of portraiture in art practices (from ancient to contemporary).
- Understand the anatomy of face, structure, light, shade, proportion and the characteristics of model.
- Develop eclectic and aesthetic knowledge about portrait making
- Develop eye and hand coordination.
- Explore ideas and improve communication skills.
- Explore the expressive possibilities of various media in the portrait painting.
- Exploring the possibilities of sketches (Indoor and Outdoor) in the field of the portrait work.

MADP- 103 Pictorial Composition (Practical - II)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know about various methods of painting and the ancient cultural tradition of art in India.
- Explain indigenous cultural tradition of mural art.
- Learn and enhance technical skill related to Pictorial Composition.
- Create original work of art and apply skills for professional ends and develop personal style and contribute to art work.
- Enrich knowledge about composition based on sketching and drawing.
- Realize the meaning of realistic and abstract value of composition
- Emphasize the significance of colour in composition.

Second Semester

MADP- 201 Western Painting (Theory - I)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know the historical aspects of Western Art through its documented events and works of art as well as to develop the aesthetic sensibility.
- Understand the major artistic styles and genres of Western Art through a broad range of time periods from prehistoric to Renaissance Art.
- Compare and contrast contemporary work with their historical antecedent.
- Enhance visual literacy, speak and write articulately about art, religion and society.
- Analyze works of western art contextually.

MADP- 202 Western Aesthetics (Theory - II)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand major changes from Early Renaissance period of Western Art and its great thinkers.
- Think critically, communicate clearly and write effectively about thought of art and aesthetics.
- Recognize and understand major aesthetically ideology.
- Analyze and compare different era's western thinkers aesthetically ideology.
- Explain historical and contemporary thoughts of art and aesthetics a critical perspective.

- Gain knowledge of Western Aesthetics from ancient to Renaissance period.
- Recognize the philosophical Approach of Western Aesthetics.
- Apply knowledge of Western and Indian Aesthetics in their own creations.

MADP- 203 Anatomy Drawing & Life Study (Practical - I)

Max Marks – 100

(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know about the role of portraiture in art practices (from ancient to contemporary).
- Understand the anatomy of face, structure, light, shade, proportion and the characteristics of model.
- Develop eclectic and aesthetic knowledge about portrait making
- Draw human figure through observation.
- Enrich knowledge about various poses of human figure Cultivate several modes of artistic expression in study from life.
- Handle light and shade appropriate for full human figure.
- Make free hand structural drawings of human figure with different gesture.
- Explore anatomical drawings of human figures.
- Experience human emotions through figure study.
- Realize the importance of light & shades in making human figure.

MADP- 204 Media and Technique Application (Practical - II)

Max Marks – 100

(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know the meaning, nature and various methods of printmaking medium and its application in the field of art.
- Understand materials, tools and processes from variety of relief techniques like Wood cut and Linoleum cut.
- Apply relief printing process in their own creation and value the historic traditions of the medium.
- Develop unique approach regarding materials to create a work of art.
- Develop communication skills through Visual Art.
- Explore the expressive possibilities of various media used in creating works of art.
- Attain and understanding of personal aesthetic and visual language.

- Understand the fundamental of drawing and move beyond the fundamental concepts.
- Explore the endless possibilities of different media.
- Develop observational skill regarding time, space, form, perspective and color.
- Sketches (Indoor and Outdoor), Exploration of Possibilities and Limitations of Various Media.
- Use creativity and imagination in Sketching and Media Exploration
- Use mediums, materials, tools and techniques
- Explore the endless possibilities of different media in contemporary art practices.

Third Semester

MADP- 301 Art of China, Korea & Japan (Theory - I)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Recognize the philosophical differences of Confucianism, Taoism and Buddhism and their impact on art of China and Japan.
- Identify the artists and their art works belonging to particular dynasty.
- Formulate knowledge about China, Korea and Japan in their art Practice.
- Know about works of artists, subjects, themes, colors, techniques, perspectives and principles used in Chinese, Korea and Japanese painting.
- Know about the changing perspective of art in the 20th century.
- Correlate between art and discoveries and use them in executing work of art.
- Analyze the impact of Socio-Political situations on art and vice-versa.
- Think critically and develop research aptitude in the China, Korea and Japan.
- Demonstrate awareness of both China and Japan art.
- Know the various aesthetic criteria by which modern art has been evaluated and discuss them in their cultural context.

MADP- 302 Indian Modern Art (Theory - II)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Know different phases of Indian art history and its stylistic changes.

- Knowledge of diverse modern art style.
- Familiar with art and praxis.
- Understand of pillar artist in the Modern Indian Art.
- Speak articulately and critically about Indian Modern art history.
- Knowledge different mediums, material, tool and techniques of Modern Art.
- Explore the endless possibilities of different media in Modern Indian Art.

MADP- 303 Composition (Practical - I)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand the fundamental of drawing and move beyond the fundamental concepts.
- Explore the endless possibilities of different media in field of composition.
- Develop observational skill regarding time, space, form, perspective and color in composition.
- Sketches (Indoor and Outdoor), Exploration of Possibilities and Limitations of Various Media in the composition.
- Explore new mediums for composition work.
- Upgrade their previous Artistic experiments.
- Know critical theories and their applications in composition.
- Know subjects and materials used in composition
- Explore socio-political subjects through composition.
- Identify the importance of realistic and abstract subject matter in composition.

MADP- 304 Advance Designing (Practical - II)

Max Marks – 100
(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand how Design and Management can be balanced to ensure professional success and better quality of life.
- Develop critical and lateral thinking approach.
- Develop a basic design concept, visualization and manipulation techniques.
- Develop an appreciation of function, aesthetics and technology in design.
- Develop basic design thinking and communication skills.

- Create activities and experiences for basic process of design, adapt in their abilities, interest and design in context of human society, economy, politics and socio-cultural aspect.
- Demonstrate an understanding of the methods of inquiry and analysis both within and among traditional liberal arts and science disciplines (Humanities, Natural Sciences, Social Sciences)
- Develop critical and lateral thinking approach in the advance designing.
- Develop a basic design concept, visualization and manipulation techniques.
- Develop an appreciation of function, aesthetics and technology in design.
- Develop basic design thinking and communication skills.
- Create activities and experiences for basic process of design, adapt in their abilities, interest and design in context of human society,

Fourth Semester

MADP- 401 European and Western Painting (Theory - I)

Max Marks – 100

(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand major changes from Pre-historic to 19th Century of Western Art and its great Artists.
- Think critically, communicate clearly and write effectively about works of western art.
- Recognize and understand major monuments, artists, methods and theories and be able to assess the qualities of works of art and architecture in their historical and cultural settings in the western painting.
- Analyze, compare and contrast Western art with Non-Western art.
- Explain historical and contemporary works of art from a critical perspective.
- Know about the turning point in western art in the 19th century.
- Identify works of art, their artistic style and their Socio-Political and Cultural context of European and western painting.
- Understand formal elements and differentiate styles among cultures overtime western art world.
- Analyze the influence of Photography in the emergence of modern western art.
- Analyze the formal, technical, stylistic, compositional, characteristics of western works of art.
- Demonstrate awareness of both western and non-western art.

MADP- 402 Environmental, Folk and Tribal Art (Theory - I)

Max Marks – 100

(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand the impact of the professional artistic societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- Understand the social environmental, cultural and historical contributions and dimensions of the art.
- Know about various methods of painting and the ancient cultural tradition of Folk art in India.
- Explain indigenous cultural tradition of Tribal and Folk art.
- Learn and enhance technical skill related to tempera process of mural painting in the field of Tribal and Folk Art.
- Create original work of art and apply skills for professional ends and develop personal style and contribute to Tribal and Folk Art work.
- Know about the techniques and materials related to the wet process of mural painting.
- Understand and develop technical skill to create Environmental, Folk and Tribal Art.
- Analyze the specific qualities of the medium to explore the possibilities of the medium for creative experimentation Environmental, Folk and Tribal Art.
- Utilize their creativity to contribute towards society Environmental, Folk and Tribal Art.

MADP- 403 Media and Technique Specialization (Practical - I)

Max Marks – 100

(Int. 25, Ext. 75)

Learning Outcomes

After the accomplishment of the course students will be able to:

- Command of the technical aspects of all processes covered.
- Conversant with multiple introductory screen printing processes
- Think critically, communicate clearly and work creatively in intellectual pursuit.
- Explore and develop personal concepts in creative expression.
- Execute freehand drawing rapidly.
- Use proper medium for visual communications.

- Draw sketches (Indoor and outdoor) as well as explore possibilities and limitations of various media and technique.
- Enhance the use of appropriate medium and technique specialization relate with the concept of art.
- Explore ideas about the language, concepts and principles of visual arts.
- Experiment in their art works and bring about innovations media and technique.
- Achieve all learning experiences and create art works accordingly media and technique specialization.
- Synthesis previous knowledge with new insights, regarding sketching and media exploration.
- Execute freehand drawing rapidly.
- Know about the new medium and technique specialization of Art world.
- Execute ideas through unconventional mediums.

MADP- 404 Dissertation or Monograph (Practical - II)

Max Marks – 100

Learning Outcomes

After the accomplishment of the course students will be able to:

- Understand about research work.
- Giving information about data collection to make research paper.
- Demonstrate to choose a topic for research work.
- Understand the process of subject selection and its importance for the Dissertation.
- Knowledge for the process of Synopses.
- Understand the importance of Art Exhibition and Art Gallery on the perspective of the project.

Prof. Sonu Dwevedi
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VISION, MISSION, PEO, PO, PSO & CO
DEPARTMENT OF PHARMACEUTICAL SCIENCES,
SIR J. C. BOSE TECHNICAL CAMPUS, BHIMTAL

Vision

Transforming young minds to develop Entrepreneurial skill and creativity to enable them become global Pharma leaders.

Mission

The Department of Pharmaceutical Sciences, Bhimtal :-

- Rests its faith in Need Based Education (NBE)
- Helps in ideal molding of students to be leaders in the field of Pharma profession and health care.
- Has developed concept based teaching and training (CBTT).
- Makes the student understand the value of training to become a good pharmacist
- Teaches the students to imbibe theoretical knowledge for perfection.
- Inspires the faculty and staff to constantly upgrade their knowledge and skill to achieve goals well aligned with the Vision and Mission

Programme Educational Objectives (PEOs)

- To produce future pharmacy leaders.
- To develop professionals adept to provide pharmaceutical care.
- To develop out of box thinkers that can be future innovators, researchers and entrepreneurs.
- To transform students as lifelong learners focused on value based education.
- To train professionals as champions of social cause.
- To impart professional knowledge to the future pharmacists, technocrats and entrepreneurs.
- To develop core competencies in the field of drug development and pharmaceutical care.

Programme Outcomes (POs)

The graduates of Pharmacy will be able to attain:

- 1. Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
- 2. Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
- 3. Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- 4. Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
- 5. Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
- 6. Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
- 7. Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
- 8. Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
- 9. The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

10. Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

11. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

Programme Specific Outcome (PSOs)

After the successful completion of the course offered the graduates will attain

- Ability to resolve problems in drug development process by application of knowledge attained.
- Ability to initiate new startup and entrepreneurship avenues.
- Ability to provide critical patient care to in patients and community pharmacies.
- Ability to conduct research for new drug development process.

Course Outcomes (COs):

S.No.	Class	Sub code	Subject	Scope	Course Outcomes
B.Pharm I Sem					
1-	B.Pharm I sem	BP101T	HUMAN ANATOMY AND PHYSIOLOGY-I (Theory)	This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.	Upon completion of this course the student should be able to 1. Explain the gross morphology, structure and functions of various organs of the human body. 2. Describe the various homeostatic mechanisms and their imbalances. 3. Identify the various tissues and organs of different systems of human body. 4. Perform the various experiments related to special senses and nervous system. 5. Appreciate coordinated working pattern of different organs of each system
2-	B.Pharm I sem	BP102T.	PHARMACEUTICAL ANALYSIS (Theory)	This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs	Upon completion of the course student shall be able to 1. understand the principles of volumetric and electro chemical analysis 2. Carryout various volumetric and electrochemical titrations 3. Develop analytical skills

3.	B.Pharm I sem	BP103T.	PHARMACEUTICS- I (Theory)	This course is designed to impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms.	Upon completion of this course the student should be able to: 1.Know the history of profession of pharmacy 2.Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations 3.Understand the professional way of handling the prescription 4. Preparation of various conventional dosage forms
4.	B.Pharm I sem	BP104T.	PHARMACEUTICAL INORGANIC CHEMISTRY (Theory)	This subject deals with the monographs of inorganic drugs and pharmaceuticals.	Upon completion of course student shall be able to 1.Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals 2.Understand the medicinal and pharmaceutical importance of inorganic compounds
5.	B.Pharm I sem	BP105T.	COMMUNICATION SKILLS (Theory)	This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.	Upon completion of the course the student shall be able to 1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation 2. Communicate effectively (Verbal and Non Verbal) 3. Effectively manage the team as a team player 4. Develop interview skills 5. Develop Leadership qualities and essentials
6.	B.Pharm I sem	BP 106RBT.	REMEDIAL BIOLOGY (Theory)	To learn and understand the components of living world, structure and functional system of plant and animal kingdom.	Upon completion of the course, the student shall be able to 1. Know the classification and salient features of five kingdoms of life 2. Understand the basic components of anatomy & physiology of plant 3. Know understand the basic components of anatomy & physiology animal with special reference to human
7.	B.Pharm I sem	BP 106RMT.	REMEDIAL MATHEMATICS (Theory)	This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.	Upon completion of the course the student shall be able to:- 1. Know the theory and their application in Pharmacy 2. Solve the different types of problems by applying theory 3.Appreciate the important application of mathematics in Pharmacy

B.Pharm II Semester					
1.	B.Pharm II sem	BP 201T.	HUMAN ANATOMY AND PHYSIOLOGY-II (Theory)	This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.	Upon completion of this course the student should be able to: 1. Explain the gross morphology, structure and functions of various organs of the human body. 2. Describe the various homeostatic mechanisms and their imbalances. 3. Identify the various tissues and organs of different systems of human body. 4. Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume. 5. Appreciate coordinated working pattern of different organs of each system 6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
2.	B.Pharm II sem	BP202T.	PHARMACEUTICAL ORGANIC CHEMISTRY –I (Theory)	This subject deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions, important physical properties, reactions and methods of preparation of these compounds. The syllabus also emphasizes on mechanisms and orientation of reactions.	Upon completion of the course the student shall be able to 1. Write the structure, name and the type of isomerism of the organic compound 2. Write the reaction, name the reaction and orientation of reactions 3. Account for reactivity/stability of compounds, 4. Identify/confirm the identification of organic compound
3.	B.Pharm II sem	BP203 T.	BIOCHEMISTRY (Theory)	Biochemistry deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.	Upon completion of course student shall be able to 1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes. 2. Understand the metabolism of nutrient molecules in physiological and pathological conditions. 3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
4.	B.Pharm	BP 204T.	PATHOPHYSIOLOGY	Pathophysiology is the study of causes of diseases	Upon completion of the subject student shall be able to –

	II sem		(THEORY)	and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.	<ol style="list-style-type: none"> 1. Describe the etiology and pathogenesis of the selected disease states; 2. Name the signs and symptoms of the diseases; and 3. Mention the complications of the diseases
5.	B.Pharm II sem	BP205 T.	COMPUTER APPLICATIONS IN PHARMACY (Theory)	This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Know the various types of application of computers in pharmacy 2. Know the various types of databases 3. Know the various applications of databases in pharmacy
6.	B.Pharm II sem	BP 206 T.	ENVIRONMENTAL SCIENCES (Theory)	Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.	<p>Upon completion of the course the student shall be able to:</p> <ol style="list-style-type: none"> 1. Create the awareness about environmental problems among learners. 2. Impart basic knowledge about the environment and its allied problems. 3. Develop an attitude of concern for the environment. 4. Motivate learner to participate in environment protection and environment improvement. 5. Acquire skills to help the concerned individuals in identifying and solving environmental problems. 6. Strive to attain harmony with Nature.
B.Pharm III semester					
1.	B.Pharm III sem	BP301T	PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)	This subject deals with general methods of preparation and reactions of some organic compounds. Reactivity of organic compounds are also studied here. The syllabus emphasizes on mechanisms and orientation of reactions. Chemistry of fats and oils are also included in the syllabus.	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Write the structure, name and the type of isomerism of the organic compound 2. Write the reaction, name the reaction and orientation of reactions 3. Account for reactivity/stability of compounds, 4. Prepare

					organic compounds
2.	B.Pharm III sem	BP302T.	PHYSICAL PHARMACEUTICS-I (Theory)	The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.	Upon the completion of the course student shall be able to 1. Understand various physicochemical properties of drug molecules in the designing the dosage forms 2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations 3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
3.	B.Pharm III sem	BP 303 T.	PHARMACEUTICAL MICROBIOLOGY (Theory)	<ul style="list-style-type: none"> Study of all categories of microorganisms especially for the production of alcohol antibiotics, vaccines, vitamins enzymes etc.. 	Upon completion of the subject student shall be able to; 1. Understand methods of identification, cultivation and preservation of various microorganisms 2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry 3. Learn sterility testing of pharmaceutical products. 4. Carried out microbiological standardization of Pharmaceuticals. 5. Understand the cell culture technology and its applications in pharmaceutical industries.
4.	B.Pharm III sem	BP 304 T.	PHARMACEUTICAL ENGINEERING (Theory)	This course is designed to impart a fundamental knowledge on the art and science of various unit operations used in pharmaceutical industry.	Upon completion of the course student shall be able: 1. To know various unit operations used in Pharmaceutical industries. 2. To understand the material handling techniques. 3. To perform various processes involved in pharmaceutical manufacturing process. 4. To carry out various test to prevent environmental pollution. 5. To appreciate and comprehend significance of plant layout design for optimum use of resources. 6. To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.
B.Pharm IV semester					
1.	B.Pharm IV sem	BP401T.	PHARMACEUTICAL ORGANIC CHEMISTRY	This subject imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions,	At the end of the course, the student shall be able to 1. Understand the methods of preparation and properties of

			-III (Theory)	important named reactions, chemistry of important hetero cyclic compounds. It also emphasizes on medicinal and other uses of organic compounds.	organic compounds 2. Explain the stereo chemical aspects of organic compounds and stereo chemical reactions 3. Know the medicinal uses and other applications of organic compounds
2.	B.Pharm IV sem	BP402T.	MEDICINAL CHEMISTRY – I (Theory)	This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.	Upon completion of the course the student shall be able to 1. Understand the chemistry of drugs with respect to their pharmacological activity 2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs 3. Know the Structural Activity Relationship (SAR) of different class of drugs 4. Write the chemical synthesis of some drugs
3.	B.Pharm IV sem	BP 403 T.	PHYSICAL PHARMACEUTICS-II (Theory)	The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.	Upon the completion of the course student shall be able to 1. Understand various physicochemical properties of drug molecules in the designing the dosage forms 2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations 3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
4.	B.Pharm IV sem	BP 404 T.	PHARMACOLOGY-I (Theory)	The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.	Upon completion of this course the student should be able to 1. Understand the pharmacological actions of different categories of drugs 2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels. 3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases. 4. Observe the effect of drugs on animals by simulated experiments 5. Appreciate correlation of pharmacology with other biomedical sciences
5.	B.Pharm	BP 405 T.	PHARMACOGNOSY	The subject involves the fundamentals of	Upon completion of the course, the student shall be able

	IV sem		AND PHYTOCHEMISTRY I (Theory)	Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties.	<ol style="list-style-type: none"> 1. To know the techniques in the cultivation and production of crude drugs 2. To know the crude drugs, their uses and chemical nature 3. Know the evaluation techniques for the herbal drugs 4. To carry out the microscopic and morphological evaluation of crude drugs
B.Pharm V Semester					
1.	B.Pharm V sem	BP501T.	MEDICINAL CHEMISTRY – II (Theory)	This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Understand the chemistry of drugs with respect to their pharmacological activity 2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs 3. Know the Structural Activity Relationship of different class of drugs 4. Study the chemical synthesis of selected drugs
2.	B.Pharm V sem	BP 502 T.	Industrial Pharmacy I (Theory)	Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Know the various pharmaceutical dosage forms and their manufacturing techniques. 2. Know various considerations in development of pharmaceutical dosage forms 3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
3.	B.Pharm V sem	BP503.T.	PHARMACOLOGY-II (Theory)	This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on different systems of body and in addition, emphasis on the basic concepts of bioassay.	<p>Upon completion of this course the student should be able to</p> <ol style="list-style-type: none"> 1. Understand the mechanism of drug action and its relevance in the treatment of different diseases 2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments 3. Demonstrate the various receptor actions using isolated tissue preparation 4. Appreciate correlation of pharmacology with related medical sciences
4.	B.Pharm V sem	BP504 T.	PHARMACOGNOSY AND	The main purpose of subject is to impart the students the knowledge of how the secondary metabolites are	<p>Upon completion of the course, the student shall be able</p> <ol style="list-style-type: none"> 1. to know the modern extraction techniques, characterization

			PHYTOCHEMISTRY II (Theory)	produced in the crude drugs, how to isolate and identify and produce them industrially. Also this subject involves the study of producing the plants and phytochemicals through plant tissue culture, drug interactions and basic principles of traditional system of medicine	and identification of the herbal drugs and phytoconstituents 2. to understand the preparation and development of herbal formulation. 3. to understand the herbal drug interactions 4. to carryout isolation and identification of phytoconstituents
5.	B.Phram V sem	BP 505 T.	PHARMACEUTICAL JURISPRUDENCE (Theory)	This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India.	Upon completion of the course, the student shall be able to understand: 1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals. 2. Various Indian pharmaceutical Acts and Laws 3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals 4. The code of ethics during the pharmaceutical practice
B.Pharm VI Semester					
1.	B.Phram VI sem	BP601T.	MEDICINAL CHEMISTRY – III (Theory)	This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasis on modern techniques of rational drug design like quantitative structure activity relationship (QSAR), Prodrug concept, combinatorial chemistry and Computer aided drug design (CADD). The subject also emphasizes on the chemistry, mechanism of action, metabolism, adverse effects, Structure Activity Relationships (SAR), therapeutic uses and synthesis of important drugs.	Upon completion of the course student shall be able to 1. Understand the importance of drug design and different techniques of drug design. 2. Understand the chemistry of drugs with respect to their biological activity. 3. Know the metabolism, adverse effects and therapeutic value of drugs. 4. Know the importance of SAR of drugs
2.	B.Phram VI sem	BP602 T.	PHARMACOLOGY-III (Theory)	This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on respiratory and gastrointestinal system, infectious diseases, immuno-pharmacology and in addition,emphasis on the principles of toxicology	Upon completion of this course the student should be able to: 1. Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases 2. Comprehend the principles of toxicology and treatment of various poisonings. 3. Appreciate correlation of pharmacology with related medical sciences.

				and chronopharmacology.	
3.	B.Pharm VI sem	BP 603 T.	HERBAL DRUG TECHNOLOGY (Theory)	This subject gives the student the knowledge of basic understanding of herbal drug industry, the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceuticals etc. The subject also emphasizes on Good Manufacturing Practices (GMP), patenting and regulatory issues of herbal drugs	Upon completion of this course the student should be able to: 1. Understand raw material as source of herbal drugs from cultivation to herbal drug product 2. Know the WHO and ICH guidelines for evaluation of herbal drugs 3. Know the herbal cosmetics, natural sweeteners, nutraceuticals 4. Appreciate patenting of herbal drugs, GMP .
4.	B.Pharm VI sem	BP 604 T.	BIOPHARMACEUTICS AND PHARMACOKINETICS (Theory)	This subject is designed to impart knowledge and skills of Biopharmaceutics and pharmacokinetics and their applications in pharmaceutical development, design of dose and dosage regimen and in solving the problems arised therein.	Upon completion of the course student shall be able to: 1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance. 2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination. 3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance. 4. Understand various pharmacokinetic parameters, their significance & applications.
5.	B.Pharm VI sem	BP 605 T.	PHARMACEUTICAL BIOTECHNOLOGY (Theory)	<ul style="list-style-type: none"> • Biotechnology has a long promise to revolutionize the biological sciences and technology. • Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes the subject interesting. • Biotechnology is leading to new biological revolutions in diagnosis, prevention and cure of diseases, new and cheaper pharmaceutical drugs. • Biotechnology has already produced transgenic crops and animals and the future promises lot more. • It is basically a research-based subject. 	Upon completion of the subject student shall be able to; 1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries 2. Genetic engineering applications in relation to production of pharmaceuticals 3. Importance of Monoclonal antibodies in Industries 4. Appreciate the use of microorganisms in fermentation technology
6.	B.Pharm VI sem	BP606T	PHARMACEUTICAL QUALITY ASSURANCE (Theory)	This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It deals with the important	Upon completion of the course student shall be able to: 1. Understand the cGMP aspects in a pharmaceutical industry 2. Appreciate the importance of documentation

				aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.	3.Understand the scope of quality certifications applicable to pharmaceutical industries 4. Understand the responsibilities of QA & QC departments
B.Pharm VII Semester					
1.	B.Pharm VII sem	BP701T.	INSTRUMENTAL METHODS OF ANALYSIS (Theory)	This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart a fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.	Upon completion of the course the student shall be able to 1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis 2. Understand the chromatographic separation and analysis of drugs. 3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.
2.	B.Pharm VII sem	BP 702 T.	INDUSTRIAL PHARMACYII (Theory)	This course is designed to impart fundamental knowledge on pharmaceutical product development and translation from laboratory to market	Upon completion of the course, the student shall be able to: 1. Know the process of pilot plant and scale up of pharmaceutical dosage forms 2. Understand the process of technology transfer from lab scale to commercial batch 3. Know different Laws and Acts that regulate pharmaceutical industry 4. Understand the approval process and regulatory requirements for drug products
3.	B.Pharm VII sem	BP 703T.	PHARMACY PRACTICE (Theory)	In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care. In community pharmacy, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling for improved patient care in the community set up.	Upon completion of the course, the student shall be able to 1. Know various drug distribution methods in a hospital 2. Appreciate the pharmacy stores management and inventory control 3. Monitor drug therapy of patient through medication chart review and clinical review 4. Obtain medication history interview and counsel the patients 5. Identify drug related problems 6. detect and assess adverse drug reactions 7. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states

					8. Know pharmaceutical care services 9. Do patient counseling in community pharmacy; 10. Appreciate the concept of Rational drug therapy.
4.	B.Pharm VII sem	BP 704T:	NOVEL DRUG DELIVERY SYSTEMS (Theory)	This subject is designed to impart basic knowledge on the area of novel drug delivery systems.	Upon completion of the course student shall be able 1. To understand various approaches for development of novel drug delivery systems. 2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
B.Pharm VIII Semester					
1.	B.Pharm VIII sem	BP801T.	BIOSTATISTICS AND RESEARCH METHODOLOGY (Theory)	To understand the applications of Biostatistics in Pharmacy. This subject deals with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non Parametric tests, ANOVA, Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using Excel.	Upon completion of the course the student shall be able to 1. Know the operation of M.S. Excel, SPSS, R and MINITAB ® , DoE (Design of Experiment) 2. Know the various statistical techniques to solve statistical problems 3. Appreciate statistical techniques in solving the problems.
2.	B.Pharm VIII sem	BP 802T	SOCIAL AND PREVENTIVE PHARMACY	The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of national health programmes. The roles of the pharmacist in these contexts are also discussed.	After the successful completion of this course, the student shall be able to: 1. Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide. 2. Have a critical way of thinking based on current healthcare development. 3. Evaluate alternative ways of solving problems related to health and pharmaceutical issues
3.	B.Pharm VIII sem	BP803ET.	PHARMA MARKETING MANAGEMENT (Theory)	The pharmaceutical industry not only needs highly qualified researchers, chemists and, technical people, but also requires skilled managers who can take the industry forward by managing and taking the complex decisions which are imperative for the	The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

				growth of the industry. The Knowledge and Know-how of marketing management groom the people for taking a challenging role in Sales and Product management.	
4.	B.Pharm VIII sem	BP804 ET	PHARMACEUTICAL REGULATORY SCIENCE (Theory)	This course is designed to impart the fundamental knowledge on the regulatory requirements for approval of new drugs, and drug products in regulated markets of India & other countries like US, EU, Japan, Australia, UK etc. It prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products.	Upon completion of the subject student shall be able to; 1. Know about the process of drug discovery and development 2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals 3. Know the regulatory approval process and their registration in Indian and international markets
5.	B.Pharm VIII sem	BP 805T	PHARMACOVIGILANCE (Theory)	This paper will provide an opportunity for the student to learn about development of pharmacovigilance as a science, basic terminologies used in pharmacovigilance, global scenario of Pharmacovigilance, train students on establishing pharmacovigilance programme in an organization, various methods that can be used to generate safety data and signal detection. This paper also develops the skills of classifying drugs, diseases and adverse drug reactions.	At completion of this paper it is expected that students will be able to (know, do, and appreciate): 1. Why drug safety monitoring is important? 2. History and development of pharmacovigilance 3. National and international scenario of pharmacovigilance 4. Dictionaries, coding and terminologies used in pharmacovigilance 5. Detection of new adverse drug reactions and their assessment 6. International standards for classification of diseases and drugs 7. Adverse drug reaction reporting systems and communication in pharmacovigilance 8. Methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle 9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation 10. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India 11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning 12. CIOMS requirements for ADR reporting

					13. Writing case narratives of adverse events and their quality.
6.	B.Phram VIII sem	BP 806 ET	QUALITY CONTROL AND STANDARDIZATION OF HERBALS (Theory)	Scope: In this subject the student learns about the various methods and guidelines for evaluation and standardization of herbs and herbal drugs. The subject also provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.	Objectives: Upon completion of the subject student shall be able to; 1. know WHO guidelines for quality control of herbal drugs 2. know Quality assurance in herbal drug industry 3. know the regulatory approval process and their registration in Indian and international markets 4. appreciate EU and ICH guidelines for quality control of herbal drugs
7.	B.Phram VIII sem	BP 807 ET.	COMPUTER AIDED DRUG DESIGN (Theory)	This subject is designed to provide detailed knowledge of rational drug design process and various techniques used in rational drug design process.	Upon completion of the course, the student shall be able to understand 1.Design and discovery of lead molecules 2.The role of drug design in drug discovery process 3.The concept of QSAR and docking 4.Various strategies to develop new drug like molecules. 5.The design of new drug molecules using molecular modeling software
8.	B.Phram VIII sem	BP808ET:	CELL AND MOLECULAR BIOLOGY (Elective subject)	<ul style="list-style-type: none"> • Cell biology is a branch of biology that studies cells – their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function. • This is done both on a microscopic and molecular level. • Cell biology research encompasses both the great diversity of single-celled organisms like bacteria and protozoa, as well as the many specialized cells in multi-cellular organisms such as humans, plants, and sponges. 	Upon completion of the subject student shall be able to; 1. Summarize cell and molecular biology history. 2. Summarize cellular functioning and composition. 3. Describe the chemical foundations of cell biology. 4. Summarize the DNA properties of cell biology. 5. Describe protein structure and function. 5. Describe cellular membrane structure and function. 6. Describe basic molecular genetic mechanisms. 7. Summarize the Cell Cycle C
9.	B.Phram VIII sem	BP810 ET.	PHARMACOLOGICAL SCREENING METHODS	This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.	Upon completion of the course the student shall be able to, 1. Appreciate the applications of various commonly used laboratory animals. 2. Appreciate and demonstrate the various screening methods

					used in preclinical research 3. Appreciate and demonstrate the importance of biostatistics and research methodology 4. Design and execute a research hypothesis independently
10.	B.Pharm VIII sem	BP 811 ET	ADVANCED INSTRUMENTATION TECHNIQUES	This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.	Upon completion of the course the student shall be able to 1. Understand the advanced instruments used and its applications in drug analysis 2. Understand the chromatographic separation and analysis of drugs. 3. Understand the calibration of various analytical instruments 4. Know analysis of drugs using various analytical instruments.
11.	B.Pharm VIII sem	BP 812 ET.	DIETARY SUPPLEMENTS AND NUTRACEUTICALS	This subject covers foundational topic that are important for understanding the need and requirements of dietary supplements among different groups in the population.	This module aims to provide an understanding of the concepts behind the theoretical applications of dietary supplements. By the end of the course, students should be able to : 1. Understand the need of supplements by the different group of people to maintain healthy life. 2. Understand the outcome of deficiencies in dietary supplements. 3. Appreciate the components in dietary supplements and the application. 4. Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

S.No.	Class	Sub code	Subject	Scope	Course Outcomes
M.Pharm I Sem PHARMACEUTICS (MPH)					
1-	M.Pharm I Sem	MPH 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.	After completion of course student is able to know, <ul style="list-style-type: none"> • Chemicals and Excipients • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
2.	„	MPH 102T	DRUG DELIVERY SYSTEMS	This course is designed to impart knowledge on the area of advances in novel drug delivery systems.	Upon completion of the course, student shall be able to understand <ul style="list-style-type: none"> • The various approaches for development of novel drug delivery systems. • The criteria for selection of drugs and polymers for the development of delivering system • The formulation and evaluation of Novel drug delivery systems.
3.	„	MPH 103T	MODERN PHARMACEUTICS	Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries	Upon completion of the course, student shall be able to understand <ul style="list-style-type: none"> • The elements of preformulation studies. • The Active Pharmaceutical Ingredients and Generic drug Product development • Industrial Management and GMP Considerations. • Optimization Techniques & Pilot Plant Scale Up Techniques • Stability Testing, sterilization process & packaging of dosage forms.

4.	„	MPH 104T	REGULATORY AFFAIRS	<p>Course designed to impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents : filing process of IND, NDA and ANDA</p> <ul style="list-style-type: none"> • To know the approval process of • To know the chemistry, manufacturing controls and their regulatory importance • To learn the documentation requirements for • To learn the importance 	<p>Upon completion of the course, it is expected that the students will be able to understand</p> <ul style="list-style-type: none"> • The Concepts of innovator and generic drugs, drug development process • The Regulatory guidance's and guidelines for filing and approval process • Preparation of Dossiers and their submission to regulatory agencies in different countries • Post approval regulatory requirements for actives and drug products • Submission of global documents in CTD/ eCTD formats • Clinical trials requirements for approvals for conducting clinical trials • Pharmacovigilance and process of monitoring in clinical trials.
5.	M.Pharm II Sem	MPH 201T	MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)	<p>This course is designed to impart knowledge on the area of advances in novel drug delivery systems.</p>	<p>Upon completion of the course student shall be able to understand</p> <ul style="list-style-type: none"> • The various approaches for development of novel drug delivery systems. • The criteria for selection of drugs and polymers for the development of NTDS • The formulation and evaluation of novel drug delivery systems.
6.	„	MPH 202T	ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS	<p>This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students' to clarify the concepts.</p>	<p>Upon completion of this course it is expected that students will be able understand,</p> <ul style="list-style-type: none"> • The basic concepts in biopharmaceutics and pharmacokinetics. • The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination. • The critical evaluation of biopharmaceutic studies involving drug product equivalency.

					<ul style="list-style-type: none"> • The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters. • The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
7.	”	MPH 203T	COMPUTER AIDED DRUG DEVELOPMENT	<p>This course is designed to impart knowledge and skills necessary for computer Applications in pharmaceutical research and development who want to understand the application of computers across the entire drug research and development process. Basic theoretical discussions of the principles of more integrated and coherent use of computerized information (informatics) in the drug development process are provided to help the students to clarify the concepts.</p>	<p>Upon completion of this course it is expected that students will be able to understand,</p> <ul style="list-style-type: none"> • History of Computers in Pharmaceutical Research and Development • Computational Modeling of Drug Disposition • Computers in Preclinical Development • Optimization Techniques in Pharmaceutical Formulation • Computers in Market Analysis • Computers in Clinical Development • Artificial Intelligence (AI) and Robotics • Computational fluid dynamics(CFD)
8.	”	MPH 204T	COSMETICS AND COSMECEUTICALS	<p>This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.</p>	<p>Upon completion of the course, the students shall be able to understand</p> <ul style="list-style-type: none"> • Key ingredients used in cosmetics and cosmeceuticals. • Key building blocks for various formulations. • Current technologies in the market • Various key ingredients and basic science to develop cosmetics and cosmeceuticals • Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.
PHARMACEUTICAL CHEMISTRY (MPC)					

1.	M.Pharm I Sem	MPC 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.	After completion of course student is able to know about chemicals and excipients <ul style="list-style-type: none"> • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
2.	„	MPC 102T	ADVANCED ORGANIC CHEMISTRY - I	The subject is designed to provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery.	Upon completion of course, the student shall be to understand <ul style="list-style-type: none"> • The principles and applications of retrosynthesis • The mechanism & applications of various named reactions • The concept of disconnection to develop synthetic routes for small target molecule. • The various catalysts used in organic reactions • The chemistry of heterocyclic compounds
3.	„	MPC 103T	ADVANCED MEDICINAL CHEMISTRY	The subject is designed to impart knowledge about recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.	At completion of this course it is expected that students will be able to understand <ul style="list-style-type: none"> • Different stages of drug discovery • Role of medicinal chemistry in drug research • Different techniques for drug discovery • Various strategies to design and develop new drug like molecules for biological targets • Peptidomimetics
4.	„	MPC 104T	CHEMISTRY OF NATURAL PRODUCTS	The subject is designed to provide detail knowledge about chemistry of medicinal compounds from natural origin and general methods of structural elucidation of such compounds. It also emphasizes on isolation, purification and characterization of medicinal compounds from natural origin.	At completion of this course it is expected that students will be able to understand- <ul style="list-style-type: none"> • Different types of natural compounds and their chemistry and medicinal importance • The importance of natural compounds as lead molecules for new drug discovery • The concept of rDNA technology tool for new drug discovery • General methods of structural elucidation of compounds of natural origin • Isolation, purification and characterization of simple

					chemical constituents from natural source
5.	M.Pharm II Sem	MPC 201T	ADVANCED SPECTRAL ANALYSIS	This subject deals with various hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are LC-MS, GC-MS, ATR-IR, DSC etc.	At completion of this course it is expected that students will be able to understand- <ul style="list-style-type: none"> • Interpretation of the NMR, Mass and IR spectra of various organic compounds • Theoretical and practical skills of the hyphenated instruments • Identification of organic compounds
6.	„	MPC 202T	ADVANCED ORGANIC CHEMISTRY - II	The subject is designed to provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery..	Upon completion of course, the student shall able to understand <ul style="list-style-type: none"> • The principles and applications of Green chemistry • The concept of peptide chemistry. • The various catalysts used in organic reactions • The concept of stereochemistry and asymmetric synthesis
7.	„	MPC 203T	COMPUTER AIDED DRUG DESIGN	The subject is designed to impart knowledge on the current state of the art techniques involved in computer assisted drug design.	At completion of this course it is expected that students will be able to understand <ul style="list-style-type: none"> • Role of CADD in drug discovery • Different CADD techniques and their applications • Various strategies to design and develop new drug like molecules. • Working with molecular modeling softwares to design new drug molecules • The in silico virtual screening protocols
8.	„	MPC 204T	PHARMACEUTICAL PROCESS CHEMISTRY	Process chemistry is often described as scale up reactions, taking them from small quantities created in the research lab to the larger quantities that are needed for further testing and then to even larger quantities required for commercial production. The goal of a process chemist is to develop synthetic routes that are	At completion of this course it is expected that students will be able to understand <ul style="list-style-type: none"> • The strategies of scale up process of apis and intermediates • The various unit operations and various reactions in process chemistry

				safe, cost-effective, environmentally friendly, and efficient. The subject is designed to impart knowledge on the development and optimization of a synthetic route/s and the pilot plant procedure for the manufacture of Active Pharmaceutical Ingredients (APIs) and new chemical entities (NCEs) for the drug development phase.	
PHARMACOLOGY (MPL)					
1.	M.Pharm I Sem	MPL 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.	After completion of course student is able to know about, <ul style="list-style-type: none"> • Chemicals and Excipients • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
2.	„	MPL 102T)	ADVANCED PHARMACOLOGY- I	The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, this subject helps the students to understand the concepts of drug action and mechanisms involved	Upon completion of the course the student shall be able to : <ul style="list-style-type: none"> • Discuss the pathophysiology and pharmacotherapy of certain diseases • Explain the mechanism of drug actions at cellular and molecular level • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
3.	„	MPL 103T	PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS - I	This subject is designed to impart the knowledge on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development. The subject content helps the student to understand the maintenance of laboratory animals as per the guidelines, basic knowledge of various in-vitro and in-vivo preclinical evaluation processes	Upon completion of the course the student shall be able to, <ul style="list-style-type: none"> • Appraise the regulations and ethical requirement for the usage of experimental animals. • Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals • Describe the various newer screening methods involved in the drug discovery process • Appreciate and correlate the preclinical data to humans

3.	„	MPL 104T	CELLULAR AND MOLECULAR PHARMACOLOGY	The subject imparts a fundamental knowledge on the structure and functions of cellular components and help to understand the interaction of these components with drugs. This information will further help the student to apply the knowledge in drug discovery process.	Upon completion of the course, the student shall be able to, <ul style="list-style-type: none"> • Explain the receptor signal transduction processes. • Explain the molecular pathways affected by drugs. • Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process. • Demonstrate molecular biology techniques as applicable for pharmacology
4.	M.Pharm II Sem	MPL 201T	ADVANCED PHARMACOLOGY - II	The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, the subject helps the student to understand the concepts of drug action and mechanism involved	Upon completion of the course the student shall be able to: <ul style="list-style-type: none"> • Explain the mechanism of drug actions at cellular and molecular level • Discuss the Pathophysiology and pharmacotherapy of certain diseases • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
5.	„	MPL 202T	PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-II	This subject imparts knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity. This knowledge will make the student competent in regulatory toxicological evaluation.	Upon completion of the course, the student shall be able to, <ul style="list-style-type: none"> • Explain the various types of toxicity studies. • Appreciate the importance of ethical and regulatory requirements for toxicity studies. • Demonstrate the practical skills required to conduct the preclinical toxicity studies
6.	„	MPL 203T	PRINCIPLES OF DRUG DISCOVERY	The subject imparts basic knowledge of drug discovery process. This information will make the student competent in drug discovery process	Upon completion of the course, the student shall be able to, <ul style="list-style-type: none"> • Explain the various stages of drug discovery. • Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery • Explain various targets for drug discovery. • Explain various lead seeking method and lead optimization • Appreciate the importance of the role of computer aided drug design in drug discovery

7.	„	MPL 204T	CLINICAL RESEARCH AND PHARMACOVIGILANCE	This subject will provide a value addition and current requirement for the students in clinical research and pharmacovigilance. It will teach the students on conceptualizing, designing, conducting, managing and reporting of clinical trials. This subject also focuses on global scenario of Pharmacovigilance in different methods that can be used to generate safety data. It will teach the students in developing drug safety data in Pre-clinical, Clinical phases of Drug development and post market surveillance.	Upon completion of the course, the student shall be able to, <ul style="list-style-type: none"> • Explain the regulatory requirements for conducting clinical trial • Demonstrate the types of clinical trial designs • Explain the responsibilities of key players involved in clinical trials • Execute safety monitoring, reporting and close-out activities • Explain the principles of Pharmacovigilance • Detect new adverse drug reactions and their assessment • Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance
PHARMACOGNOSY (MPG)					
1.	M.Pharm I Sem	MPG 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.	Objectives After completion of course student is able to know, <ul style="list-style-type: none"> • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
2.	„	MPG 102T	ADVANCED PHARMACOGNOSY - I	To learn and understand the advances in the field of cultivation and isolation of drugs of natural origin, various phytopharmaceuticals, nutraceuticals and their medicinal use and health benefits.	OBJECTIVES Upon completion of the course, the student shall be able to know the, <ul style="list-style-type: none"> • Advances in the cultivation and production of drugs • Various phyto-pharmaceuticals and their source, its utilization and medicinal value. • Various nutraceuticals/herbs and their health benefits • Drugs of marine origin • Pharmacovigilance of drugs of natural origin
3.	„	MPG 103T	PHYTOCHEMISTRY	Students shall be equipped with the knowledge of natural product drug discovery and will be able to isolate, identify and extract and the phytoconstituents	Upon completion of the course, the student shall be able to know the, <ul style="list-style-type: none"> • Different classes of phytoconstituents, their biosynthetic pathways, their properties, extraction and general process of natural product drug discovery

					<ul style="list-style-type: none"> • Phytochemical fingerprinting and structure elucidation of phytoconstituents.
4.	„	MPG 104T	INDUSTRIAL PHARMACOGNOSTICAL TECHNOLOGY	To understand the Industrial and commercial potential of drugs of natural origin, integrate traditional Indian systems of medicine with modern medicine and also to know regulatory and quality policy for the trade of herbals and drugs of natural origin.	<p>OBJECTIVES By the end of the course the student shall be able to know,</p> <ul style="list-style-type: none"> • the requirements for setting up the herbal/natural drug industry. • the guidelines for quality of herbal/natural medicines and regulatory issues. • the patenting/IPR of herbals/natural drugs and trade of raw and finished materials.
5.	M.Pharm II Sem	MPG 201T	MEDICINAL PLANT BIOTECHNOLOGY	To explore the knowledge of Biotechnology and its application in the improvement of quality of medicinal plants	<p>Upon completion of the course, the student shall be able to,</p> <ul style="list-style-type: none"> • Know the process like genetic engineering in medicinal plants for higher yield of Phytopharmaceuticals. • Use the biotechnological techniques for obtaining and improving the quality of natural products/medicinal plants
6.	„	MPG 202T	ADVANCED PHARMACOGNOSY - II	To know and understand the Adulteration and Deterioration that occurs in herbal/natural drugs and methods of detection of the same. Study of herbal remedies and their validations, including methods of screening	<p>Upon completion of the course, the student shall be able to know the,</p> <ul style="list-style-type: none"> • validation of herbal remedies • methods of detection of adulteration and evaluation techniques for the herbal drugs • methods of screening of herbals for various biological properties
7.	„	MPG 203T	INDIAN SYSTEMS OF MEDICINE	To make the students understand thoroughly the principles, preparations of medicines of various Indian systems of medicine like Ayurveda, Siddha, Homeopathy and Unani. Also focusing on clinical research of traditional medicines, quality assurance and challenges in monitoring the safety of herbal medicines.	<p>After completion of the course, student is able to</p> <ul style="list-style-type: none"> • To understand the basic principles of various Indian systems of medicine • To know the clinical research of traditional medicines, Current Good Manufacturing Practice of Indian systems of medicine and their formulations

8.	”	MPG 204T	HERBAL COSMETICS	This subject deals with the study of preparation and standardization of herbal/natural cosmetics. This subject gives emphasis to various national and international standards prescribed regarding herbal cosmeceuticals.	After completion of the course, student shall be able to, <ul style="list-style-type: none"> • understand the basic principles of various herbal/natural cosmetic preparations • current Good Manufacturing Practices of herbal/natural cosmetics as per the regulatory authorities
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Vision, Mission, PEO, PO, PSO & CO of

**DEPARTMENT OF FORESTRY AND ENVIRONMENTAL SCIENCES,
D.S.B. CAMPUS, NAINITAL AND SOBAN SINGH JEENA CAMPUS, ALMORA
KUMAUN UNIVERSITY**

(Accredited as an 'A' Grade by ICFRE, Dehradun)



About the Department

The Uttarakhand state nearly accounted for 71 percent forest area, which offers wide opportunities to the students with graduate and post graduate degrees in Forestry. The management of forest cover is one of the major challenges before the state from which major ecosystem services emanate. Thus, Forestry education would help in fulfilling the growing demand for Forestry professionals for conservation and management of Forestry resources at national and international levels. The Department of Forestry, Kumaun University, Nainital was established in 1978 at DSB campus, Nainital and in 1997 at Soban Singh Jeena campus, Almora with the objective that the students would provide knowledge for conservation and scientific management of the forests and natural resources in the region. The department of Forestry and Environmental Sciences has attained the goal of starting undergraduate and post-graduate programmes, conducting researches and implementing extension programmes in the envisaged areas. At present the department has post graduate and doctoral level status. Keeping in view the growing environmental concerns like global climate change, the department was upgraded to Department of Forestry and Environmental Sciences in the year 2010 and now upgraded to Department of Forestry and Agriculture Sciences in 2019. The department has published more than 400 research papers in the national and international journals of repute. Over the last several years, the students of Forestry have been appointed in the Forest Corporation, Indian Council of Forestry Research and Education (ICFRE), various universities, paper mills, and various other government and non-government organizations. The department has signed MoU with Herbal Research Development Institute, Gopeshwar, Govind Ballabh Pant Institute of Himalayan Environmental and Development, Kosi-Katarmal; National Botanical Garden, Lucknow (NBRI); National Bureau of Plant Genetics Resources (NBPGR), Bhowali; Central Himalayan Environmental Association (CHEA) and CEDER, Dehradun for interdisciplinary research.

Accreditation/ Affiliation status:

The department has been again accredited as an 'A' Grade by the Indian Council of Forestry Research and Education, Dehradun on March 17, 2017 upto June 21st, 2022.

Vision:

- To produce competent professional by imparting quality education to meet the industry requirements and for serving the societal needs
- Conservation and Scientific Management of the natural resources of the state/country by training forestry students,
- To meet the growing demand of forestry and environmental professionals in natural resource based industries, government and NGO sectors.

Mission:

- Developing excellence in Forestry Education and Research in the country.
- To contribute to the advancement of knowledge through teaching, research, publications and dissemination,
- To strengthen the interface of academia with the government and industry and prepare the next generations of skilled and ethical professionals.
- Efforts to galvanize the academic fervour and creative instincts of the youth coming from socially and economically backward areas.

Programme Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) for the Forestry and Agriculture Sciences programs describe accomplishments that graduates are expected to attain within three to five years after graduation.

- PEO – 1** : To provide knowledge for conservation and scientific management of the forests and natural resources of the region.
- PEO – 2** : To meet the growing demand of forestry and environmental professionals in natural resource based industries, government and NGO sectors.
- PEO – 3** : To strengthen the interface of academia with the government and industry and prepare the next generations of skilled and ethical professionals.
- PEO – 4** : Efforts to galvanize the academic fervour and creative instincts of the youth coming from socially and economically backward areas.

Programme Outcomes (POs)

The UG and PG graduates of Forestry and Agriculture Sciences will be able to:

- PO – 1** : **Professional Knowledge:** Apply the fundamentals and practical knowledge to solve the complex forestry/agricultural problems.
- PO – 2** : **Problem analysis:** Use professional knowledge they identify, formulate and analyze complex problems reaching substantiated conclusions.
- PO – 3** : **Design/development of solutions:** Design and diagnosis solutions for complex problems or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO – 4** : **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

- PO – 5** : **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern technology and IT tools including prediction and modeling to complex forestry activities with an understanding of the limitations.
- PO – 6** : **Environment and sustainability:** Understand the impact of climate change and GHG's on environmental sustainability, demonstrate the knowledge and need for sustainable development of the Earth.
- PO – 7** : **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms.
- PO – 8** : **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams and/or multidisciplinary professionals..
- PO – 9** : **Communication:** Communicate effectively with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO – 10** : **Project management and finance:** To provide a deep understanding of educational research and be competent to carry out independent need based quality field researches.
- PO – 11** : **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcome (PSOs)

After the successful completion of UG and PG programs in Forestry and Agriculture Sciences, the graduates will be able to:

- PSO – 1** : Use signal processing concepts and tools to provide solutions to real time problems.
- PSO – 2** : Create, select, and apply appropriate techniques, resources, and modern technology, RS and: integrate ICT in teaching-learning and assessment process to enrich professional practice.
- PSO – 3** : To strengthen the interface of academia with the government and industry and prepare the next generations of skilled and ethical professionals.
- PSO – 4** : Efforts to galvanize the academic fervour and creative instincts of the youth coming from socially and economically backward areas.

LIST OF POSTGRADUATE COURSES

M. Sc. FORESTRY
SEMESTER CURRICULUM
(20 credits in each semester (total credits 80))

Semester	Paper	Title(Core and elective courses)	Total Credits(LTP)
Semester - I	4411	Forest Ecology and its advances	04(LTP)
	4412	Forest Mensuration and Biostatistics	04(LTP)
	4413	Advances in Silviculture	04(LTP)
	4414	Agroforestry Principles and Systems	04(LTP)
	4415	Project report/field training /practical	04(LTP)
	Total credits		20(LTP)
Semester - II	4421	Forest Resources and Economics	04(LTP)
	4422	Forest Legislation and Policies	04(LTP)
	4423	Forest Biodiversity and conservation	04(LTP)
	4424	Advances in Forest Management	04(LTP)
	4425	Project report/field training /practical	04(LTP)
	Total credits		20(LTP)
Semester -III	4431	Nursery and plantation technology	04(LTP)
	4432	Management of insect– pest and diseases	04 (LTP)
	Elective course: Three elective papers will be opted from the following given list		
	4433	Research Methodology	04(LTP)
	4434	Computer Application and Information Technology	04(LTP)
	4435	Forest Genetics and Tree Improvement	04(LTP)
	4436	Biotechnology Approaches in Forestry	04(LTP)
	4437	Climate change and Remote sensing	04(LTP)
	4438	Project report/field training /practical (Compulsory)	
	Total credits		20(LTP)
Semester- IV	4441	Forest Products and Industries	04(LTP)
		Elective course: three elective papers will be opted from the following given list	

	4442	Energy plantation and bio-fuels	04(LTP)
	4443	Environmental Impact Assessment	04(LTP)
	4444	Ecotourism: Concept and Approaches	04(LTP)
	4445	Taxonomy of Woody Plants	04(LTP)
	4446	Medicinal and Aromatic plants	04(LTP)
	4447	Project report/field training /practical (Compulsory)	04(LTP)
Open elective course: One open elective papers will be opted from the following given list			
	4448	Dissertation	04(LTP)
	4449	Tree Seed Technology	04(LTP)
	4450	Environmental Science	04(LTP)
	Total credits		20(LTP)
Total credits for the course (core course=52 credits, elective course=24 credits and open elective course=04 credit)			80 (LTP)

SEMESTER I

Core course

Paper-I

FOREST ECOLOGY AND ITS ADVANCES

Course No.: 4411

Total Credit: 4(LTP)

Objective

To provide knowledge about concept of forest and environment sciences, major issues and challenges, origin of earth, composition of atmosphere, lithosphere, hydrosphere and biosphere, Environmental parameters and their impact on biota. Forest ecosystem concept, stand dynamics, forest succession, productivity and vegetation forms and natural regeneration of tree species.

Course Outline

Theory Lecture

S.No.	Topics
1.	Concept of ecology and environmental sciences, major issues and challenges, origin of earth, composition of atmosphere, lithosphere, hydrosphere and biosphere.
2.	Classification of world vegetation, and vegetation forms of India, Biogeographic regions of world and India
3.	Forest ecosystem – major ecosystems of the world, structure, biotic and abiotic components of ecosystem.
4.	Biomass, productivity, litter fall and litter decomposition.
5.	Forest nutrient and cycling –input, accumulation (storage) and output (ecosystem loss), nutrient use efficiency.
6.	Disturbance in forest ecosystem: nature of disturbance, fire, wind, flood and invasive species, restoration of degraded ecosystems.
7.	Ecological succession – mechanism and ecosystem change during succession, succession models and concept of climax.
8.	Methods of sampling of community- quadrat, line transect, point frame method and vegetational analysis (qualitative and quantitative characters).
9.	Ecosystem services

Practical

S.No.	Topics
1.	Map preparation of world vegetation and mapping of different biogeographic regions of world and India
2.	Vegetational analysis of different plant communities
3.	Experiments on sapling methods used in ecological research.
4.	Visit to nearby forests and study different stages of succession.
5.	Estimation of biomass and net primary productivity in different forest types.
6.	Estimation of litter production and decomposition rate of different forest types.
7.	Study of vegetation of different region of India.
8.	Impact assessment of invasive plant species on biodiversity
9.	Ecosystem service estimation

Paper-II

FOREST MENSURATION AND BIOSTATISTICS

Course No.: 4412

Total Credits: 4(LTP)

Objective

To develop understanding of students about tree measurements, forest inventory and yield concepts.

Course Outline

Theory Lecture

S.No.	Topics
1.	Basics of forest mensuration- diameter, height, form of tree.
2.	Determination of volume of standing and felled trees, uses and application of volume tables.
3.	Determination of age of standing and felled trees.
4.	Determination of growth of tree (stem and stump analysis) classification of increment and increment percentage.
5.	Forest inventory and sampling design, random, multistage and non-random sampling.
6.	Stand structure, density and site quality measures, modern tools GPS etc. for measurements.
7.	Statistical mean, mean deviation, standard deviation and standard error.
8.	Simple correlation and linear regression.
9.	Elementary idea on probability – normal, binomial and poisson distribution.
10.	Test of significance based on normal, t and Chi square test.
11.	Experimental design CRD, RBD, LSD, Split plot designing and strip plot.

Practical

S.No.	Topics
1.	Measurement of diameter and height at different situations, develop relationship between diameter and girth for given species.
2.	Determination of volume of logs and wood pieces by quarter girth and xylometric formula.
3.	Estimation of volume of timber using volume equation(s).
4.	Age determination of standing tree by Pressler's increment borer and felled trees by ring count.
5.	To develop CAI and MAI relationship for the given species.
6.	Use of GPS in forest inventory.

Paper-III

ADVANCES IN SILVICULTURE

Course No.: 4413

Total credits 4(LTP)

Objective

To provide knowledge about Forest ecosystem concept, stand dynamics forest succession, productivity and vegetation forms and natural regeneration of tree species.

Course Outline

Theory Lecture

S. No.	Topics
-----------	--------

1. Definition of forest and forestry, silviculture systems as a plan for management, timber harvesting and silviculture.
2. Champion and Seth's classification of Forest Types of India and its limitations, influence of forests on environment.
3. Site factors – climate, edaphic, physiographic, biotic factors.
4. Interaction of site factors- Leibig's law of minimum, Shelford's law of tolerance, hardness and tolerance.
5. Concept and objectives of regeneration, advantages and disadvantages of different regeneration methods, preparation, maintenance and management of site, factors affecting regeneration.
6. Natural regeneration under clear felling, uniform shelter wood, irregular shelter wood, group and selection systems, methods obtaining assisted natural regeneration.
7. Artificial regeneration, objectives and methods of artificial regeneration, selection of species-kinds of mixture, pattern of mixture, choice between natural and artificial regeneration.
8. Tending operation- weeding, cleaning, thinning (objectives and types) and improvement, salvage and sanitation cuttings.

Practical

S.No. Topics

1. Study of harvesting operations practiced in nearby forest area
2. Inventory and assessment of natural regeneration of given species.
3. Mapping and comments on different forest types of India and Uttarakhand.
4. Collection, preservation and identification of plant specimens of different states of India.
5. Observe and analyze regeneration under different silvicultural systems.

Paper-IV

AGROFORESTRY: PRINCIPLES AND SYSTEMS

Course No.: 4414

Total credits: 4(LTP)

Objective

To impart knowledge on the concept of agroforestry land use includes diagnosis and design methodologies, soil and water management biogeochemical cycling of nutrients and to acquaint the students with principles of economics and use of economic tools in appraisal of the agroforestry systems.

Course Outline

Theory Lectures

S.No. Topics

1. Agroforestry- concept, scope (overview of global agroforestry), objectives, importance and research needs.
2. Agroforestry potentials and constraints, land capability classification and land use pattern.
3. Agroforestry systems – shifting, taungya, alley cropping, shelter belts, wind breaks, home gardens, agriculture based systems, forest based systems pasture based and horticulture based systems.
4. Selection of tree species and crop/inter crop in different agro-climatic zones of India.
5. Conservation and management of soil and water; soil organisms, nitrogen fixing tree species, nutrient cycling and budgeting; production and productivity in different agroforestry systems.
6. Tree crop interaction – exotic tree based, indigenous tree based, allelopathy.
7. Principles of harvesting, post harvest handling, marketing of agroforestry products.

8. Economic of agroforestry, net present value, internal rate of return, cost benefit analysis.
9. Recent trends in research, diagnosis and design in agroforestry.

Practical

- | S. No. | Topics |
|---------------|--|
| 1. | Survey and analysis of land use systems in the adjoining areas. |
| 2. | Design and plan of suitable models for improvement. |
| 3. | Mineral nutrient analysis of soil and plants. |
| 4. | Study of crop –weed association and fertilizer response in different crops. Preparation and application of herbicides. |
| 5. | Application of various methods in formulation and appraisal of agro-forestry projects. |
| 6. | Nutrient analysis of forages derived from fodder trees/shrubs. Digestibility of some agro-forestry forages. |
| 7. | Benefit-cost ratio estimation of agroforestry systems |
| 8. | Case studies on harvesting, post harvest management and marketing of agroforestry products. |
| 9. | Visit to nearby agroforestry practicing area and interaction with the practicing farmers. |

Paper-V

PROJECT REPORT/FIELD TRAINING /PRACTICAL

Course No.: 4415

Total credits: 4(LTP)

In this paper, the assignments related to project report/field training including practical works will be given to the students so that the skill, entrepreneurship and value addition related task could be developed.

SEMESTER II

Core course

Paper-I

FOREST RESOURCES AND ECONOMICS

Course No.: 4421

Credit Hours: 4(LTP)

Objective

To develop understanding of students about forest resources and economics management decisions, natural and environmental resource accounting.

Course Outline

Theory Lecture

- | S.No. | Topics |
|--------------|--|
| 1. | Application of microeconomics in solving forest resource problems. |
| 2. | Emphasis on forest products, demand and supply, production theory, forest products marketing, forest capital theory, and concept of cost. |
| 3. | Regional and international trade of non-timber forest products (NTFP's), logs and lumber. |
| 4. | Valuation of NTFPs and non-market goods and economics of multiple-use. Ecosystem services and market based mechanism and capital at global level, forest valuation |

5. Forest certification, sustainability Analysis, SWOT Analysis.
6. Application of operations research tools in evaluating forest management alternatives in public and private forest planning, role of forestry sector in economic upliftment of communities.

Practical

- | S.No. | Topics |
|-------|--|
| 1. | Exercises on estimation of demand and supply functions. |
| 2. | Valuation of marketed forestry products. |
| 3. | Valuation of biodiversity and non-marketed forestry products. |
| 4. | Exercises on financial and economic appraisal of forestry projects. |
| 5. | EIA study of a given site |
| 6. | Exercises on marketing of forest products and international trade competitiveness. |
| 7. | SWOT analysis of a given project. |

Paper-II

FOREST LEGISLATION AND POLICIES

Course No.: 4422

Total Credits: 4(LTP)

Objective

To develop understanding of students about laws, forest policies and international conventions.

Course Outline

Theory Lectures

S.No.	Topics	No. of Lectures
1.	Constitutional and legislative provisions – fundamental norms, divisions of legislative authority, environmental legislation and article 253.	
2.	Forest policy – Relevance and scope; National Forest Policy – 1894, 1952 and 1988.	
3.	General principles of criminal law; Indian Penal Code, criminal procedure code. Indian evidence act applied to forestry matters.	
4.	Forest laws; Indian Forest Act –1927, Forest Conservation Act 1980, general provision and silent features, Forest (Conservation) rules and amendments.	
5.	Wildlife Protect Act 1972 and amendments The Biological diversity act, 2002. Silent features and national biodiversity authority.	
6.	National green tribunal act, 2010; important Forest Rules and Guidelines	
7.	Environmental (Protection) Act, 1986, National Environmental Policy, 2006, Forest Right Act, 2006.	

Tutorials

1. Comments and assignment of above topics.

Paper – III

FOREST BIODIVERSITY AND CONSERVATION

Objective

To develop understanding of students about ecological aspects of forest, conservation of forest resources & biodiversity, consequences of depleting biodiversity and sustainable use of biodiversity.

Course Outline**Theory Lecture**

S.No.	Topics	No. of Lectures
1.	Concept of biodiversity, magnitude of biodiversity, levels of biodiversity.	3
2.	Importance, use and threats to biodiversity. Causes of biodiversity loss and the IUCN red list.	5
3.	Assessment of biodiversity –inventory, monitoring, REDD, REDD+	3
4.	Natural resources –Types, degradation and conservation, in-situ and ex-situ, hotspot areas, protected area net work, wildlife sanctuaries, national parks, biosphere reserves, zoo, botanical gardens, arboretum etc. and conservation of sacred groves.	6
5.	evaluation of forests genetical resources (FGR), Handling and storage of FGR conservation, vulnerability of FGR, quarantine laws, and FGR exchange, germplasm bank, Intellectual property rights and biodiversity	5
6.	Role of community in biodiversity conservation, indigenous knowledge of biodiversity, biodiversity conservation and community development, biodiversity and ecosystem services.	5
7.	International efforts for conservation of biodiversity – International Union for Conservation of Nature and Natural Resources, United nations Environmental Program, Convention on Biodiversity, World Heritage Convention, Conference on Parties, Convention on International Trade of Endangered species, World Wide Fund for nature and natural Resources.	3

Practical

S.No.	Topics
1.	Field inventory for biological diversity and determination of minimum size of sampling unit for trees, shrubs and herbs
2.	Collection, identification and herbarium preparation of plant species.
3.	Calculation of species richness index in different forests.
4.	Calculation of different indices of biodiversity, evenness, concentration of dominance, similarity index.
5.	Calculation of α , β and γ diversity of a landscape.
6.	Visit to nearby community forest and analyses their role in conservation of biological diversity.
7.	Visit to National Parks, wildlife sanctuaries, botanical gardens and arboretum.
8.	Comment on various national and international agencies.
9.	List of IUCN indexed plants of India

Paper IV**ADVANCES IN FOREST MANAGEMENT**

Course No.: 4424

Total Credits 4(LTP)

Objective

To provide knowledge about forest management, ecosystem management, site quality evaluation, stand density & forest valuation.

Course Outline

Theory Lecture

S.No.	Topics
1.	Introduction, principles, concept, criteria, scope, objectives, elements and methods of forest management.
2.	Forest organization, sustained yield, rotation and normal yield.
3.	Types of yield, yield regulation in regular and irregular forests (area, volume, increment, volume and increment basis)
4.	Yield table and stand table, yield prediction models, their preparation and applications.
5.	Management of community forests- participatory forest management, joint forest management, forest development agencies, Compensatory Afforestation Fund Management and Planning Authority.
6.	Forest Working Plan – preparation, working plan code, measurement of growing stock, case study of working plan division.

Tutorials

1	Calculation of growing stock and yield using different formula
2	Calculation of yield data using yield table
3	visit to forest division in which working plan is under progress
4	Preparation of different growth and yield models
5	Case study of working plan of a forest division.

Paper-V

PROJECT REPORT/FIELD TRAINING /PRACTICAL

Course No.: 4415

Total credits: 4(LTP)

In this paper, the assignments related to project report/field training including practical works will be given to the students so that the skill, entrepreneurship and value addition related task could be developed.

SEMESTER III

Core course

Paper-I

NURSERY AND PLANTATION TECHNOLOGY

Course No.: 4431

Total Credit 04(LTP)

Objective

To impart knowledge on modern nursery techniques about types of nursery, vegetative propagation, use of green house, mist chamber and fertilizer use.

Course Outline

Theory Lecture

S.No.	Topics
1.	Introduction and importance, type of nursery including the modern
2.	Quality seed collection (Seed stand, SPA, seed orchard), processing, storage, sowing , germination, pre-sowing treatments
3.	Vegetative propagated nursery- selection of superior phenotype, methods of propagation (Cutting, budding, grafting and layering),hormones used for rooting, factors affecting rooting of cuttings, methods of micro- propagation
4.	Containerized nursery- Type and size of container including root trainers, potting media
5.	Types of green house and mist chamber, mist propagation, shade houses
6.	Nursery irrigation- drip, sprinkler, spot and flood irrigation
7.	Growing medium, fertilizers (bio & chemical), manure and compost, sanitation, integrated nutrient management.
8.	Nursery production and management- soil and water management – soil amendments, pricking, watering including drip irrigation, weeding and hoeing.
9.	Plantation: Definition, concept, objectives and scope of plantation, types of plantation, pit digging techniques, fencing, raising techniques of plantation,plantation biomass and productivity, nutrient cycling of plantation, role of plantation in industries and climate change and success and failure of plantations.

Practical

S.No.	Topics
1.	Comment on modern equipments and tools used in nursery
2.	Preparation of nursery beds and growing media for containerized plants
3.	Application of various pre-sowing seed treatments
4.	Testing of seeds mainly for purity, moisture, viability, germination and pathogens
5.	Use of vegetative propagation methods such as budding, grafting and layering
6.	Use of plant bio-regulators for rooting in different spacing
7.	Collection and identification of nursery insects-pests, diseases and application of their control measures
8.	Inoculation of different bio- fertilizers
9.	Visit to nearby nurseries and observe propagation methods applied for different species
10.	Use of soil amendments in the nursery

Paper-II

MANAGEMENT OF INSECT-PEST AND DISEASES

Course No.: 4432

Credit Hours: 04(LTP)

Objective

To impart knowledge about maintaining plantations and forests under disease free conditions.

Course Outline

Theory Lecture

S.No.	Topics
1.	Introduction of entomology and pathology including classification, identification and symptoms
2.	Importance insects- pests of seed, nursery and plantations
3.	Important defoliator- skeletonizer, shoot borers and wood borers of sal, Shisham, Khair,

- Teak, Poplar, Eucalyptus, Oak, Pine, Deodar
4. Physical, cultural, chemical and biological control methods of insects, use of attractions and repellants, male sterility techniques principles and methods of integrated pests managements
 5. Abiotic agents of tree diseases and their relationship with hosts
 6. Disease of forest nurseries and plantations- root, heart diseases, physiological disorders
 7. Major diseases of Sal, Sissoo, Khair, Teak, Acacia, Eucalyptus, Poplar, Deodar, Chir
 8. Method of disease control- cultural, biological and chemical
 9. Seed pathology and plant quarantine

Practical

- | S. No. | Topics |
|--------|--|
| 1. | Collection, preservation and identification of different insects |
| 2. | Collection, , preservation and identification of different fruiting bodies of pathogenic and non- pathogenic fungi |
| 3. | Inspection and collection of insect damaged material |
| 4. | Identification and use of plant protection equipments |
| 5. | Preparation of different concentrations of pesticides |
| 6. | Symptoms and identification key of important disease of natural forest and Plantations |
| 7. | Preparation of fungicidal concentrations and their application in forests and plantation |
| 8. | Identification of nursery insects and disease and their control measurs |
| 9. | Collection and preservation of butterflies and moths |

Electives course: Three elective papers will be opted from the following.

Paper – III

RESEARCH METHODOLOGY

Course No.: 4433

Credits: 04(LTP)

Objective:

To provide exposure about methods of statistical analysis, designs and sampling techniques.

Course Outline:

Theory Lecture

- | S.No. | Topics |
|-------|---|
| 1. | Nature and type of research, selection of research problem considering national forest policy |
| 2. | Formulation of research problem, objectives, source of identifying a problems definition of the problem, hypothesis |
| 3. | Estimation and testing of Hypotheses, concept of point and interval estimation, estimators and estimates, properties of good estimators- unbiasedness and minimum variance |
| 4. | Germination of research questions, planning for literature survey, planning for field work, collection and recording of data and use of statistical tools. |
| 5. | Interpretation of data and deriving inferences and conclusion |
| 6. | Writing of project proposal and preparation of research project report, thesis and dissertation |
| 7. | Writing of scientific articles and technical bulletins, monitoring and evolution methods |
| 8. | Sampling and designing Random Stratified Cluster and systematic sampling. Principles of experimental designs, types of experimental design CRD, RBD, LSD, Row-Column (alpha) designs, Split plot and Strip Plot Designs |

Practicals

S.No.	Topics
1.	Fitting of probability distributions
2.	Computation of correlations and regression
3.	Exercise on tests of significance – t, F, Z and X^2
4.	Laying out of designs in the field (i) Latin Square, (ii) Randomized block design, (iii) Split plot design, (iv) Row- Column designs and (V) Scattered block
5.	Data analysis of the above designs
6.	Data entry operation and database design
7.	Exposure to statistical packages SPSS

Paper-IV

COMPUTER APPLICATION AND INFORMATION TECHNOLOGY

Course No.: 4434

Credit Hours: 4(LTP)

Objective

To develop understanding about Computer based modeling, data base management and networking.

Course Outline

Theory Lecture

S.No.	Topics
1.	Introduction to computer- characteristics of computer, basic computer organization (input/output unit, storage unit, ALU, CU, CPU)
2.	Number system (binary, octal, hexadecimal number system and conversion)
3.	Memory storage- flash drive, memory card (SD/MMC), CD/DVD/blue ray disk/HDD
4.	Operating system basic concepts, database management programme
5.	Computer software- system software, application software, free software and firmware. Application software package- word processing, creating documents, printing, formatting, header and footers, tables and importing graphics. Data analysis package- SPSS, Statistica etc
6.	Basic use of statistical package, spread sheet, graphs and charts, mathematical functions, averages, correlation and regression
7.	Presentation- creating presentation, auto content wizards, templates and importing multimedia in presentation
8.	Introduction to Information Technology- Network and internet, elements of communication system, network topologies, network type, wireless network, internet, e-mail and internet protocol (http, ftp, telnet). Internet browser (web browser), searching, moogole maps, earth and other application. Scope of IT in forestry

Practicals

S.No.	Topics
1.	Working with database design and data entry operation
2.	Word processing: MS Office. Database management programme
3.	Use of electronic spread sheet and graphics
4.	Use of SPSS statistical application packages

5. Assignments on the above topics

Paper-V

FOREST GENETICS AND TREE IMPROVEMENT

Course No.: 4435

Credit Hours: 04(LTP)

Objective:

To acquaint the students about general principles of tree breeding with examples of important trees.

Course Outline

Theory Lectures

S.No.	Topics
1.	General concept of forest tree breeding, tree improvement and forest genetics
2.	Reproduction in forest trees, dimorphism pollination mechanisms. Pollen dispersion distance, pollinators and their energetic. Attractants for pollinators. Pollen handling forced flowering for seed orchard manipulation. Pollination mechanisms. Variation in trees importance and its causes
3.	Natural variation as a basis for tree improvement. Geographic variations- Ecotypes, clines, races and land races. Seed, seed formation, dispersal, storage, stratification and seed dormancy
4.	Selective breeding methods- mass, family, within family, family plus within family. Plus tree selection for wood quality, disease resistance and agroforestry objectives. Selection strategies and choice of breeding methods and progress in selective breeding in forest trees. Indirect selection for biotic and abiotic stresses. Progeny and clone testing
5.	Seed orchards- type, functions and importance. Estimating genetic parameters and genetic gain. Heterosis breeding: inbreeding and hybrid vigour. Manifestation and fixation of heterosis. Species and racial hybridization
6.	Indian examples- teak, sal, shisham, eucalyptus, acacias, pines and poplars. Polyploidy, aneuploidy and haploidy in soft and hard wood species. Induction of polyploidy
7.	Marker assisted selection, Breeding methods for wood quality, agroforestry, diseases and pest resistance, drought and salt resistance. Tree improvement case histories
8.	Hardy-weinberg law, null hypothesis, wohlund's principle, Mutation breeding
9.	Economics of tree breeding

Practical

S.No.	Topics
1.	Observation of modes pollination and reproduction in forest trees
2.	Estimation pollen viability and controlled pollination experiment
3.	Field practice in emasculation, crossing and selfing in local plants
4.	Manipulation of flowering through hormonal application
5.	Identification of ecotypes, races and land-races in natural forest
6.	Marking of candidate trees, plus trees and elite trees
7.	Induction of polyploidy through colchicines treatment
8.	Successful case studies of tree breeding
9.	Visit to seed orchard

Paper-VI

BIOTECHNOLOGY APPROACHES IN FORESTRY

Course No.: 4436

Credit Hours: 4(LTP)

Objective:

To imbibe an understanding of scope, potential and techniques in forest biotechnology and to prepare them for experimentation in the discipline.

Course Outline**Theory Lecture**

S.No.	Topics
1.	Historical development of biotechnology, scope of biotechnology in forestry, different methods of biotechnology related to forestry
2.	Gene regulation, genetic engineering techniques
3.	In vitro selection and micro propagation in forestry for conservation
4.	Plant tissue culture and response pattern; application of plant tissue culture in tree improvement
5.	Basis of operation in DNA manipulation, molecular markers and its application in forestry
6.	Importance type bio-pesticides and control of pests
7.	Inoculation, advantages and types of bio-fertilizers and mycorrhiza
8.	Genetically modified crops and ethical issues
9.	Bioinformatics- definition, tools in analysis and approaches
10.	Modification of plant species to practically desired products; biodegradation of forestry wastes through genetically engineered microbes

Practicals

S.No.	Topics
1.	Micro propagation technique, Preparation of MS media, collection of explants
2.	Acquaintance of different instruments use in biotechnology
3.	Visit to nearby tissue culture laboratories and beverage industry
4.	Isolation of rhizobium bacteria from root nodules and its culture
5.	Nursery inoculation of different mycorrhiza and bio-fertilizer

Paper-VII**CLIMATE CHANGE AND REMOTE SENSING****Course 4437****credits 04(LTP)****Objective**

To develop understanding of students about global climatic changes and to acquaint with the use of imageries, GIS and simulation in forest survey and management.

Course Outline**Theory Lecture**

S.No.	Topics
1.	Earth's climate systems- origin and structure of atmosphere
2.	Impact of global warming and climate change- major green house gases, green house effect, ultra- violet radiation, ozone depletion, acid rain, future climate predictions
3.	Tool to study global climate change
4.	Adaptation to climate change- national and international initiative for mitigating climate change
5.	Basic of Remote Sensing- platforms, sensors (active and passive systems)
6.	Satellite systems and Images- uses and limitation, elements of data collection and data analysis

7. Visual and Digital Image Processing, Ground truth, Geo-referencing, Acquisition and interpretation of satellite data for forestry purpose
8. Elements of Geographic Information System- GIS tools, components, applications
9. Data and information on forest resources- collection, storage and analysis. Software used in remote sensing and Geographical information system. GPS and uses Advance of Remote Sensing and GIS and future prospects

Practical

S.No.	Topics
1.	Uses of various photo-grammetry instruments
2.	Ground truthing of Satellite Image
3.	GPS data collection
4.	Hands on practice on remote sensing and GIS software
5.	Visual and Digital interpretation of satellite image
6.	Recognition and identification of objects on photography, compilation of maps and their interpretation
7.	Carbon foot print calculation of a given area
8.	Estimation of carbon sequestration rate of different Himalayan trees
9.	Comments on different tools used in climate change study

Paper-VIII

PROJECT REPORT/FIELD TRAINING /PRACTICAL (Compulsory)

Course No.: 4438

Total credits: 4(LTP)

In this paper, the assignments related to project report/field training including practical works will be given to the students so that the skill, entrepreneurship and value addition related task could be developed.

SEMESTER -IV

PAPER - I

FOREST PRODUCTS AND INDUSTRIES

Course No.: 4441

Credit Hours: 04(LTP)

Objective

The course will equip the students regarding wood based industries. How it is affecting the economy of the country such as match and splint, sports and pencil making, besides this wood extracts resins and gums, katha, tannin and various type of non timber products. Practical will make them aware regarding extracting method of different products of wood.

Course Outline: Theory lecture

Topics

1. Introduction, Scope and importance of forest based industries in relation to Indian economy
2. Brief description of types of forest based industries in India
3. Pulp and paper industry- types of paper, raw material, pulping (mechanical, chemical and semi-chemical), beating, bleaching, sizing and sheet formation
4. Description about rayon and other cellulose derived products
5. Composite wood plywood, laminated wood, core board, sandwich board, particle board and their manufacturing processes, properties and uses
6. Principles of destructive distillation of hardwood and softwood, preparation of wood alcohol, acetic acid, acetone, charcoal and allied chemicals. Scarification of wood chemistry and processes; production of wood molasses, alcohol yeast and other by products from wood hydrolysis and wood substitution
7. Manufacture of Katha and cutch
8. NTFP based industries drugs and essential oils (medicine), bidi, turpentine, lac, tans and dyes

Practical

S.No. Topics

1. Comments on various NTFPs
2. Extraction of essential oil by distillation and solvent extraction process
3. Field inventory for medicinal plants
4. Visit to nearby wood based industries e.g. paper mill, kattha mil, packing case, plywood industries and other industries present in the area

Elective course: Three elective papers will be opted from the following

PAPER - II

ENERGY PLANTATION AND BIO-FUELS

Course No.: 4442

Credit Hours: 04(LTP)

Objective

To acquaint with various aspects of production, integrated nutrient and irrigation management and ecological factors in raising forest plantations.

Course Outline

Theory lecture

S.No. Topics

1. Selection of site for planting operations, arrangement of staff, organization of plantation work, planting activities and maintenance of plantations
2. Choice of species adopted, characteristics of fodder fuel-wood, optimizing energy fixation
3. Problems, techniques and suitable species for afforestation in desert, water logged area, saline and alkaline soils, degraded hills, mine spoil
4. Energy and biomass consumption pattern in India. Environment impact of biomass energy
5. Assessment of bio-energy programs in India. Power generation from energy plantation, High Density Energy Plantation (HDEP), Land and biomass availability for sustainable bio energy
6. Petro- crops – criteria for evaluation of different species for energy plantation
7. Impact of energy efficiency in power sector, need for research and development on environment friendly and socio-economically relevant technologies
8. Network of NGOs in renewable energy use. Energy from plants- problems and prospects. Recent energy technologies in the production of bio-fuels

Practical

S.No.	Topics
1.	Identification of important fuel woods and petro-crops
2.	Determination of calorific value, moisture and ash content in biomass
3.	Study on different bio-fuels used in India
4.	Study of energy consumption pattern in rural and urban areas through survey
5.	Visit to nearby energy plantation(s) and energy unit(s)
6.	Plantation layout in different patterns
7.	Preparation of energy budget for the given area/village/household

PAPER – III

ENVIRONMENTAL IMPACT ASSESSMENT

Course No.: 4443

Credit Hours: 04(LTP)

Objective:

To train the students in planning and evaluation projects in the country.

Course Outline

Theory lecture

S.No.	Topics
1.	Introduction; principle and purpose of EIA and its significance for the society
2.	Environmental components of EIA- air, water, land, noise and ecological environment
3.	Cost and benefits of EIA; EIA involvement during project life cycle
4.	EIA management; principles and management of EIA, main stages in EIA processes; screening, scoping, prediction, mitigation and alternatives auditing
5.	EIA techniques, checklists, matrices, network method, remote sensing and GIS
6.	Main participants in EIA process, public consultation and participation in EIA process
7.	Environmental appraisal procedure in India
8.	EIS formulation. New approaches to EIA and SEA (Strategic environmental assessment)

Practical

S.No.	Topics
1.	Preparation of EIA report of a given project
2.	Preparation of SEA report

Paper-IV

ECOTOURISM – CONCEPT AND APPROACHES

Course No.: 4444

Credit Hours: 04 (LTP)

Objective:

To acquaint about various forms of tourism and evolution of ecotourism and its impact on ecology.

Course Outline

Theory lecture

S.No.	Topics
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1. Major ecosystems of the world
2. Eco tourism- study history of tourism, identify various forms of tourism and evolution of ecotourism
3. Dimensions of tourism and essential conditions for tourism to occur
4. Differences between tourism components Mass tourism versus ecotourism
5. Understand dimensions of ecotourism and the criteria to qualify for ecotourism
6. Ecotourism indicators and conceptual differences between developing and developed countries
7. Organized tours and free Independent Travelers
8. Ecotourism in practices in important protected areas- Corbett National park, Nanda Devi Biosphere reserve, Kanha National park, Kajaranga National park, Gir National park, Rajaji National park
9. Participation of local people in ecotourism limitations and problems
10. World Tourism Organization. Problems with definition of ecotourism and criticisms. International organizations and NGOs promoting ecotourism
11. Sociological implications of eco-tourism

Practical

S. No. Topics

1. Prepare a detailed reference on the various forms of Ecotourism in the world
2. Visit to various ecotourism areas and identify the tourism components- suggest modifications
3. Exercises on the blending of local cultural and sociological heritage with the various forms of ecotourism
4. Evaluation and monitoring of the various ecotourism activities of the region such as National Walk, The guided day trek, the Tiger Trall, Border Hiking, Bamboo Rafting, Jungle Patrol, Tribal Heritage. Jungle Inn, The Soared groves, Bamboo Grove, Green Mansions, the backwater cruise
5. Study the carrying capacity and impact of ecotourism activity on the ecosystem
6. Climate change and its influence on carbon economy

Paper-V

TAXONOMY OF WOODY PLANTS

Course No.: 4445

Credit Hours: 04(LTP)

Objective:

To provide knowledge of importance and scope of dendrology, principles and systems of classification of plants and general studies on herbarium, arboretum and xylarium.

Course Outline

Theory Lecture

- | S.No. | Topics |
|-------|---|
| 1. | Introduction- importance and scope of dendrology |
| 2. | Principles and systems of classification of plants. Bentham and Hooker's and Hutchinson's System |
| 3. | Plant Nomenclature |
| 4. | Role of vegetative morphology in identification of woody forest flora; herbarium techniques, collection, processing and preservation of plant material, arboreum and xylarium |
| 5. | Study of families, as survey of forest resources: Magnoliaceae, Dipterocarpaceae, Malvaceae, Tiliaceae, Rutaceae, Meliaceae, Sapindaceae, Anacardaceae, Rhizophoraceae, Fabaceae, Caesalpiniaceae, Mimosaceae, Combretaceae, Myrtaceae, Lythraceae, Ericaceae, Sapotaceae, Ebenaceae, Oleaceae, Verbenaceae, Lauraceae, Santalaceae, Euphorbiaceae, |

Ulmaceae, Moraceae, Betulaceae, Fagaceae, Salicaceae, Palmaceae, Poaceae, Pinaceae, Cupressaceae, Taxaceae

6. Geographical distribution of important Indian trees, native trees, exotic trees, endemism, allelopathy with respect to forest trees

Practical

S.No. Topics

1. Morphology description of plant parts
2. Methods of plant material collection and Techniques of preparing herbarium specimens
3. Application of different preservatives used in herbarium
4. Survey and descriptive study of woody flora of Magnoliaceae, Dipterocarpaceae, Malcaceae, Tiliaceae, Rutaceae, Meliaceae, Celastraceae, Sapindaceae, Aceraceae, Anacardaceae, Fabaceae, Caesalpiniaceae, Mimosaceae, Rosaceae, Combretaceae, Myrtaceae, Punicaceae, Cornaceae, Ericaceae, Sapotaceae, Symplococaceae, Oleaceae, Verbenaceae, Lauraceae, Santalaceae, Euphorbiaceae, Ulmaceae, Moraceae, Betulaceae, Fagaceae, Salicaceae, Arecaceae, Poaceae, Taxaceae, Pinaceae, Cupressaceae families.

Paper-VI

MEDICINAL AND AROMATIC PLANTS

Course No.: 4446

Credit Hours: 04(LTP)

Objective:

To acquaint the student with the breeding procedures for quality improvement of important medicinal and aromatic plants.

Course Outline

Theory Lectures

S.No. Topics

1. Plant genetic resources- general perspective
2. Ecology and biology of plant resources of medicinal value. Medicinal and aromatic plant diversity in the Indian gene center
3. Plant exploration, introduction & exchange
4. Conservation of medicinal and aromatic plants; its techniques- in situ, ex- situ & biotechnological
5. Evaluation and breeding techniques of important medicinal and aromatic plants – *Picrorhiza kurrooa*, *Swertia chirayita*, *Valeriana jatamasi*, *Viola* spp., *Gloriosa superba*, *Rauwolfia serpentina*, *Plantago ovata*, *Cassia angustifolia*, *Ocimum sanctum*, *Withania somnifera*, Distinctiveness, uniformity, stability testing
6. Drug descriptors for medicinal and aromatic plants
7. Cultivation of commercially importance medicinal and aromatic plants *Picrorhiza kurrooa*, *Aconitum heterophyllum*, *Podophyllum hexandrum*, *Swertia chirayita*, *Valeriana jatamansi*, *Asparagus recemosus*, *Phyllanthus emblica*, *Terminalia chebula*, *Terminalia bellirica*, *Rheum emodi*

Practical

S. No. Topics

1. Identification and collection of medicinal plants growing on the locality
2. Determination of mode of reproduction
3. Seed germination testing of selected medicinal plants
4. Rapid mapping exercise for mapping of medicinal plants
5. Comments and constituents of different ayurvedic medicines
6. Calculation of species richness and diversity of medicinal plants in different forest types of the state

Paper-VII

PROJECT REPORT/FIELD TRAINING /PRACTICAL (compulsory)

Course No.: 4447

Total credits: 4(LTP)

In this paper, the assignments related to project report/field training including practical works will be given to the students so that the skill, entrepreneurship and value addition related task could be developed.

Open elective course: One of the following papers (dissertation/special papers) will be opted.

Paper-VIII

DISSERTATION

Course No.: 4448

Credit Hours: 04(LTP)

Paper-IX

TREE SEED TECHNOLOGY

Course No.: 4449

Credit Hours: 04(LTP)

Course Outline

Theory lecture

S.No.	Topics
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- | | |
|----|---|
| 1. | Introduction – Seed and its importance. |
| 2. | Role of seed technology in nursery stock production. |
| 3. | Production of quality seed, identification of seed collection areas-seed orchards – maintenance of genetic purity-isolation and roguing, seed source (provenance and stands). |
| 4. | Selection of seed tree (genotypic and phenotypic selection), plus tree (pure stands, elite seed tree, isolated tree and their location). Seed Collection – Planning and Organization, Collection methods, Factors affecting seed collection, Seed maturity and tests. |
| 5. | Seed processing – Seed extraction, drying, blending, cleaning, grading, treating, bagging, labeling and storage. |
| 6. | Storage – orthodox, intermediate and recalcitrant seeds, precautions of handling of recalcitrant seeds, natural longevity of tree seeds, factors affecting longevity. |
| 7. | Seed testing (sampling, mixing and dividing, determination of genuineness, germination, moisture, purity, vigour, viability). Seed dormancy, classification and breaking of seed dormancy. |
| 8. | Different viability and vigour tests, seed pelleting, seed health. Classes of tree seeds, certification and procedures of tree seeds certification. |

Practical

S.No.	Topics
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- | | |
|----|---|
| 1. | Identification of seeds of tree species, Seed maturity tests; Physical purity analysis; Determination of seed moisture; Seed germination test; Hydrogen peroxide test; Tetrazolium test for viability; Seed vigour and its measurements |
| 2. | Identification of seed dormancy and methods of breaking dormancy in tree seeds Testing membrane permeability; Study of seed collection and equipments; Planning of seed collection; Seed extraction. |

Paper-X

ENVIRONMENTAL SCIENCE

Course No.: 4450

Credit: 04(LTP)

Course Outline

Theory lecture

S.No.	Topics
1.	Environment Science scope and application
2.	Environment interactions with organisms, Methodological approaches in Environment Science
3.	Global and Indian environment – past and present status. Environmental pollution and pollutants. Air, water, food, soil, noise pollution – sources, causes, control measures and types. Smog, acid rain, global warming, ozone hole, eutrophication, sewage and hazardous waste management.
4.	Impact of different pollutions on humans and other organisms and on environmental quality. Biological magnification, of toxins in the environment. Deforestation – forms and causes relation to environment.
5.	Prevention and control of pollution – technological and sociological measures and solutions – Indian and global efforts. Case studies, analysis on Environmental disasters and their remedial measures.
6.	International and voluntary agencies for environmental conservation – mandates and activities. Environmental ethics.
7.	Causes of environmental degradation – socio-economic factors. Human population growth and lifestyle. EMP, Environmental audit, ecological and economic issues in solving environmental problems.
8.	International conventions and summits – major achievements. Environmental policy and legislation in India. Need for environmental impact assessment, various projects. Modern tools for better management of environment

Practical

S. No.	Topics
1.	Visit to local areas – river/forest/Horticulture farm/ grassland/catchment etc.
2.	To document components of ecosystem. Study of common plants, insects, birds and animals.
3.	Visit to industries to study pollution abatement techniques

Department of English, Kumaun University, Nainital

PROGRAMME EDUCATIONAL OBJECTIVES

The programme M. A. English aims at imparting knowledge in English Literature and skills in using English language at the postgraduate level. The main objectives of the programme are:

1. To enable learners to form a substantial foundation on literary forms, the history of English language, literature and great literary works which shall also include representative texts of American and Indian literature.
2. To impart skills to critically evaluate and appreciate literary works, to extend this ability to other cultural and artistic forms.
3. To equip the students with an in-depth knowledge of a wide spectrum of genres and writers.
4. To enable the students to acquire communicative skills and a global perspective of English language.
5. To enable the students to understand the multicultural context of English language and British, American and Indian Literature.
6. To hone the creative and critical talent of the student which otherwise remains dormant and unharnessed.
7. To enable students to compete nationally and globally.
8. To assist students in the development of intellectual flexibility, creativity and cultural literacy so that they may engage in life-long learning.
9. To enable the students to pursue professional courses/jobs in Teaching, Translation, Tourism, Media Industry etc.
10. To enable the students to become good human beings.



Professor Roald Hoffman
Nobel Prize (1981) Chemistry

“I like the idea that human beings can do anything they want to. They need to be trained sometimes. They need a teacher to awaken the intelligence within them. But to be a chemist requires no special talent. Anyone can do it, with hard work”

Mission

The Importance of chemistry arises because so many other disciplines draw on certain chemical principles and concepts. Engineers need to know the chemical behaviour of the materials they use, Biologists need to know some chemistry in order to understand processes such as metabolism and energy conversion in organisms, people in the field of medical technology need to understand the chemical basis of the tests and analyses that they perform, pharmacists must understand the chemistry of drug reactions and interactions, nutritionists need to have some understanding of the way the body functions chemically so that they can provide the proper nutrients. So, many other fields are there where chemistry knowledge is required. *Our mission is to prepare our students for all those fields where knowledge of chemistry is required including academia.*

Programme Educational Objectives (PEOs)

The department runs three programmes. At undergraduate level, it has a six-semester degree course comprising of Inorganic, Organic, Physical and Analytical Chemistry including laboratory classes related to all of the aforementioned branches. The postgraduate course structure is of four semesters with inorganic, organic and physical specializations. In Ph. D. programme, six-month course is compulsory with major areas of natural products chemistry and nanotechnology. Therefore, the objectives are to;

- ❖ educate and train the graduate and postgraduate students in all the theoretical and experimental aspects of chemistry.
- ❖ guide and expose the students for proper handling of the equipments.
- ❖ generate critical, creative and scientific skills and encourage the students for innovations.
- ❖ prepare the students for achieving their goals towards professional life.
- ❖ enhance the academic and professional ethics among students.
- ❖ motivate them towards group activities and team work.

Programme outcomes (POs)

After having completed the chemistry courses, the students will be able to;

- Work safely, take data carefully, record relevant observations, use time effectively, assess the efficiency of experimental methods, plan for experimental work and solve problems and think like a chemist.
- Identify the problems and resolve them.

- Have good intuitive sense of chemical reactions and mechanism.
- Think independently and work in a group to develop innovative methods to meet needs of the society.
- Operate and maintain the basic instruments used for analyses.
- Transform chemistry knowledge into industrial outcomes.
- Understand the importance of chemistry in research on solid waste management, environment issues and other contemporary issues.
- Have the leadership qualities which will allow them to be able to lead in any situation and in any areas.

Programme Specific Outcomes (PSOs)

To prepare students who could pursue fruitful career they have chosen in academic or non-academic domains. The aim of running chemistry courses at different levels from Undergraduate to Ph. D. programme is to produce professionally qualified chemists who could look for better drug designing, drug delivery through nano materials, biologically active natural products, molecules with anticancer activity, innovation in solid waste management and contributing to minimize environmental hazards.

KUMAUN UNIVERSITY, NAINITAL

DEPARTMENT OF GEOGRAPHY

The Department of Geography is one of the oldest Departments in the region. It has two campuses one at the DSB Campus Nainital and other one is at the SSJ Campus Almora. The Department of Geography D.S.B.Campus Almora was established by the Department of Higher Education, Government of Uttar Pradesh under the Agra University on 19th August, 1951. The Department of Geography at the SSJ Campus Almora was established in 1955 when it came into being as Degree College affiliated to the Agra University. With the establishment of Kumaun University in 1973, it became Constituent College and elevated to the status of University Campus in 1994.campus Almora.

The Department has the honour of organizing Scientific Symposium of 21st International Geography Congress [IGC] of the International Geographical Union [IGU] in 1968; and hosting the first International Summer School on Land Use Studies in association with Aligarh Muslim University in 1965. The Department is equipped with state of art Remote Sensing and Geographic Information System [GIS] Lab. The Department has been playing a very significant role in the creation and dissemination of state-of-art new knowledge in various emerging issues of global to local significance, such as the implementation of the United Nations Sustainable Development Goals [SDGs]; Climate Change Impact, Adaptation and Mitigation; Water, Health, Livelihood and Food Security; Disaster Risk Reduction; Gender Mainstreaming; Natural Resource Management, Green and Resilient Urban Growth, Institutions and Governance with a specific focus on Sustainable Mountain Development in context of the Indian Himalayan Region [IHR]. The Department is promoting wider applications of the emerging and frontier areas of science and technology, particularly Remote Sensing, Geographic Information System [GIS] and Global Positioning System [GPS] both in teaching-learning and research.

The Department of Geography, SSJ Camus Almora was identified by the DST Government of India for Setting-up Centre of Excellence for Natural Resources Database Management in Uttarakhand (COE NRDMS) in 2009. The Objective of this Centre are to conduct advanced research and Master Degree Programme on Geographic Information Science (for more details visit: www.coenrdmsalmora.org). Based on the laboratory infrastructure developed COE NRDMS, the Department started two years Master's Degree Course, viz, MSc in Remote Sensing and GIS having 30 seats. This is a hi-tech and highly job-oriented course having 80% job placement.

Based on its academic performance, this department was identified by the Department of Science and Technology, Government of India for the award under its FIST programme in 2005. Through this FIST award, GIS and RS laboratory was established in the department. The laboratory is well equipped with hi-tech latest GIS/RS software and hardware. Besides specialization in Physical and Human Geography, the department with the help of FIST aided GIS/RS laboratory, two latest papers, viz., GIS & GPS Applications and Remote Sensing Applications have been started at PG level since the academic year 2010-11. The faculty members of the departments have participated in number of national and international conferences, seminars and workshop within the country and abroad, and have published more that 200 research papers, written 10 books, organized more than two dozen workshops to

disseminate newly emerging technologies of Geographic Information Science, known as GI Science. Besides Fulbright Fellow, DST Young Scientist Fellow, CSIR Research Associate ship, the department has produced Scientists, Professors, Readers, Lecturers and Administrative Officers who have worked/working in different parts of our country.

VISION OF THE DEPARTMENT

Geography as a subject is offered at the undergraduate and postgraduate level to Arts, Science, students so as to enhance and apply their knowledge and skills in multidisciplinary areas. Upon graduation, the students will be able to understand the impact of information and Knowledge change in the society. Also, they will be able to appreciate the current usage of in various fields of importance like agriculture, business, and industry. Further, the students will be exposed to the current trends in understand basic physical and Human systems that affect everyday life (e.g. earth-sun relationships, water cycles, wind and ocean currents Population, settlement, Transport).

MISSION OF THE DEPARTMENT

- Prepare students to present themselves effectively in a dynamic knowledge and Technological, era.
- Promote the understanding and application of the spatial organization of society and see Order in what often appears to be random scattering of people and places.
- Enable to have sound knowledge of the theory and practical behind the core subjects
- Facilitate the development and application of problem-solving skills in students.
- After all students socially responsible citizens.

The programme consists of Six Semesters, each with Two Theory Papers and One Practical Course. In Semester-III the Students have to participate in compulsory Survey Camp organized normally outside the University Campus. The theory and practical programmes have been designed in such a way that they help students in attaining the holistic knowledge of the subject and in the overall development the personality that includes physical, intellectual, moral, professional and aesthetic dimensions of human development.

The main objectives of the programme are:

- To acquaint students with the various dimensions of geographical and interdisciplinary knowledge and field realities.
- To develop students' comprehensive understanding of the major concepts, thoughts, and ideas of both conventional and modern streams and branches of Geography and its field applications.
- To expose students to emerging areas of science and technology, such as applications of Remote Sensing [RS], Geographical Information System [GIS], and Global Positioning System [GPS], and help them in building professional competence with in-depth knowledge.
- To sharpen students' critical, creative, liberal, innovative, and scientific thinking in the subject.
- To motivate students in involving in self-reflexivity and lifelong learning.
- To inspire students in integrating different aspects of physical, practical, aesthetic, moral and intellectual dimensions of educations to develop a holistic personality of each student.

- To help the student in becoming responsible citizen for the nation and a sensitive and creative human resource for the society strong value base and ethics.
- To familiarize students with environmental contexts, inclusivity and sustainable development, technology, discussion, professional studies and research.

PROGRAMME OUTCOMES [POs]:

PO1: Enrichment of Intellectual Ability: The programme develops students' comprehensive understanding of the various dimensions of geographical and interdisciplinary knowledge and field realities. It acquaints students with the major concepts, thoughts, and ideas of both conventional and modern branches of Geography and interdisciplinary streams of knowledge, and their field applications. It also enriches their analytical, critical, creative faculties.

PO2: Inculcation of Planning Abilities: The programme develops effective planning abilities including time management, resource management, delegation skills and organizational skills of students which may develop their leadership qualities.

PO3: Appropriate Application of Knowledge Methodological Tools: The programme makes a sincere attempt of familiarizing students with critical knowledge and methodological tools which help them in making applications of new ideas, thoughts, and concepts in the real world.

PO4: Formation of Professional Identity: The programme intends to develop professional skills among students that would help them in building their professional identity as well becoming professional leadership from local to global level.

PO5: Developing Communicative Competence: The programme intends to develop grammatical and communicative competence among students and make them aware of the nature, form and function of Hindi and English languages. The programme therefore nurtures listening, writing, speaking and reading skills of students which allow them to communicate effectively and improves their access to new knowledge.

PO6: The knowledge, Knower and Society: The programme disseminates the fact the conception and distribution of knowledge in any form seems meaningless unless it is seen functioning in a society which is defined by the existence of human beings. Thus, the programme intends to integrate knowledge with the human society and nature. This will help in Creating a Sustainable, Flexible, Enduring and Peaceful Global Society.

PO7: Environment and Sustainability: The unprecedented growth and development have disrupted the nature as well as natural resources. In view of this, the programme intends to prepare students to respond to some major issues of environmental conservation and sustainable development.

PO8: Lifelong Learning: The programme would motivate and inspire the students to strive on the path of lifelong learning as creation and acquaintance of emerging knowledge and ideas.

PROGRAMME SPECIFIC OUTCOMES [PSOs]

PSO1. Understand the complexities of man and nature relationships.

- PSO2. Integration of Geography with various social and natural sciences.
PSO3. Developing geography as an important professional discipline
PSO4. Identifying new areas for the application of Space and Geo-spatial Sciences.
PSO5. Develop capacity to find solutions to new and emerging risks and challenges that the global society is facing currently.

UNDER GRADUATE (B. A/B.Sc) SEMESTER COURSE FRAMEWORK

SEMESTER-I (July 2019 onwards)

Geography (B.A/B. Sc)

PAPER I -PHYSICAL GEOGRAPHY (GUGP-101)

Max. Marks: 50

Lecture-04

Term End Exam: 35, Internal Assessment: 15

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

- This course will familiarize students to the basic understanding of the constituents of Information Technology.
- The intention is to lay the foundation for the core subjects.
- To polish their practical knowledge in office automation tool.
- Describe, Meaning, Scope and Branches of Physical Geography, Explain the Origin of the earth, Interior of the earth, Rocks
- Interpret Origin of continents and ocean basins and related theories, and describe Mountains, Plateau and Plains, Gradational processes, Weathering and Erosion.
- Analyze Composition and structure of atmosphere, Isolation, Vertical and Horizontal Distribution of atmospheric temperature, Pressure and pressure belts, Winds: Planetary, Periodic and Local.
- Describe Ocean bottom topography, Ocean deposits, Salinity, Temperature, Ocean currents, Tides and Coral reefs.

PAPER II- GEOGRAPHY OF ASIA (Excluding India) (GUGP-102)

Max. Marks: 50

Lecture-04

Term End Exam: 35, Internal Assessment: 15

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

- Describe Structure and relief, Drainage, Climate, Natural vegetation, Soils, Natural regions of Asia
- Analyze Population distribution, Agriculture and agriculture regions, Principal minerals.
- Classify Industries and industrial regions, Transport, Major cities, Sources of power.
- Describe Regions and countries: Japan, China, Pakistan, Indonesia, Iran and Israel.

PAPER III- PRACTICAL (Basic Cartographic) (GUGP-P-103)

Max. Marks: 50

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -NA, Viva Voce-10, Record File- 10

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

- Draw different types of Scales
- Enlarge, reduce and combine different types of maps
- Describe concept, nature and scope of cartography, Globe and maps, Essentials of maps, History of map making, Types and uses of maps, Elements of map reading
- Learn and practice Cartographic representation of relief: Hachures, Contours, Form-line, Spot height, Bench mark, Trig point, Layer tint; Interpolation of contours

SEMESTER-II

PAPER I- GEOMORPHOLOGY (GUGP-201)

Max. Marks: 50

Lecture-04

Term End Exam: 35, Internal Assessment: 15

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

- Describe Nature and scope of Geomorphology, Dominant contemporary methodologies, The role and nature of time in Geomorphology, Space in Geomorphology
- Describe Models of Landscape Evolution: Davis, Penck, King and A time-independent model of Heck, Deterministic modelling of process-response.
- Analyze Isostasy, Seismicity, Vulcanicity, Tectonic and neo-tectonic landforms
- Describe Mass wasting and associated landforms, Landforms associated with geomorphic agents: surface water, underground water, glaciers, sea waves and winds

PAPER II- GEOGRAPHY OF INDIA (GUGP-202)

• **Max. Marks: 50**

• **Lecture-04**

• **Term End Exam: 35, Internal Assessment: 15**

• **Learning Outcomes: On completion of the course, the student will be able**

• **to:**

- Describe Physical features, Geologic structure, Drainage system, Climate, Natural vegetation, Soils, Natural regions
- Map Agriculture, Crops, Agriculture production, Agriculture regions, Irrigation, Livestock raising and Fishery
- Describe Industries Industrial regions, Minerals and Power resources
- Analyze Population density, distribution and urbanization, Transport, Multipurpose projects, Foreign trade, Regional development and planning

PAPER III- PRACTICAL – (Map Reading and Interpretation) (GUGP-P-203)

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -NA, Viva Voce-10, Record File- 10

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

- Reading and classifying Indian topographical maps
- Interpretation of topographical maps and preparation of base map, index map, drainage map, orographic map
- Interpretation of topographical maps and preparation of land use map, settlement map and transport network map.
- Reading Indian weather maps: Their interpretation and preparation of weather report

SEMESTER-III (July 2019 onwards)

PAPER I- CLIMATOLOGY AND BIOGEOGRAPHY (GUGP-301)

• **Max. Marks: 50**

• **Lecture-04**

• **Term End Exam: 35, Internal Assessment: 15**

• **Learning Outcomes: On completion of the course, the student will be able**

• **to:**

• Describe Nature and scope of climatology, General circulation of the atmosphere, monsoon, Local winds, Humidity, Fog and clouds, Precipitation, Air Masses, Cyclones and anticyclones.

• Classify Climate type and describe their distribution, understand Climate change

Analyze Biosphere and bio-geography-concept, scope and components, Ecosystem concept, component and functioning, Ecology- some conceptual aspects

• Describe Distribution of plants in different ecosystem and ecological conditions, Distribution of animals in different ecosystem and ecological conditions, Environmental degradation.

PAPER II- HUMAN GEOGRAPHY (GUGP-302)

• **Max. Marks: 50**

• **Lecture-04**

• **Term End Exam: 35, Internal Assessment: 15**

• **Learning Outcomes: On completion of the course, the student will be able**

• **to:**

• Define concept of Human Geography and describe Nature and scope of Human Geography, Branches of Human Geography, Concept of man-environment relationship: Determinism, Possibilism and Neo-determinism

• Describe Evolution of man: Classification of races, Characteristics of races and their broad distribution, Human adaptation to the environment: Eskimo, Bushman, Masai, Naga and Tharus

• Map Growth and distribution of population, World pattern: Physical, economic and social factors, Major human agglomerations, Migration: Internal and international

• Describe and Classify Rural settlements: Types and pattern, Urban settlement: Evolution and classification, Rural houses in India, Cultural regions of the world

PAPER III- PRACTICAL – THEMATIC CARTOGRAPHY (GUGP-P-303)

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -NA, Viva Voce-10, Record File- 10

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

- Represent geographical data by (a) dot method (b) proportional sphere method and circle method.
- Represent climatic data: Climatograph, Climograph and Hythergraph
- Represent economic data: Agriculture land use and production and industrial data, Representation of population data: Growth, distribution and employment
- Describe Drainage ordering, Slope analysis: Wentworth's and Smith's methods

SEMESTER-IV (2016-19)

PAPER I- URBAN GEOGRAPHY (GUGP-P-401)

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to:**
- Discuss concept of Urban Geography, Urbanism and urbanization, Trends of urbanization in the world
- Describe Towns and culture, Origin and growth of ancient towns, Modern towns and their problems, Site and situation of towns, Urban morphology: Meaning and principles
- Map Urban areas and conurbation, Rural-urban fringe, Umland
- Describe Functional classification of towns, Hierarchy of urban settlement, Town planning: Meaning and principles

PAPER II- ENVIRONMENT GEOGRAPHY (GUGP-P-402)

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to:**
- Define Concept, Scope and evolution of Environmental Geography, Environment, Man and environmental processes
- Describe Ecosystem: Food chains, Trophic levels and Productivity, Energy flow, Circulation of element and Geo-biochemical cycle
- Describe Ecosystem services, Biomes, Bio-diversity, Soil system, Man and climate
- Interpret Environmental degradation, Environmental events and hazards, Environmental pollution, Environmental conservation and planning

PAPER II- WORLD REGIONAL GEOGRAPHY (EXCEPT ASIA) (GUGP-P-402-(b))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to:**

- Explain Meaning and scope of Regional Geography, Regions and regionalism, Globalization and WTO, Population-environment and sustainable development
- Describe Europe: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of United Kingdom
- Describe North America: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of United States of America
- Describe Latin America: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of Brazil

PAPER III- PRACTICAL- SURVEYING (GUGP-P-403)

Max. Marks: 50

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -NA, Viva Voce-10, Record File- 10

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

- Describe Fundamentals of Surveying: Objects, Primary divisions of survey, Classification
- Perform Surveying by Prismatic Compass: Radiation, Intesection, Close Traverse, Open Traverse, and Correction of bearing
- Perform Plane Table Surveying: Radiation, Intesection, Close Traverse, Open Traverse, Resection by two point and three-point problems
- Measure height/depth by Indian Pattern Clinometer

SEMESTER-V (July 2019 onwards)

PAPER I- EVOLUTION OF GEOGRAPHICAL THOUGHTS (GUGP-501)

• **Max. Marks: 50**

• **Lecture-04**

• **Term End Exam: 35, Internal Assessment: 15**

• **Learning Outcomes: On completion of the course, the student will be able to:**

- Define and analyze concept and purpose of Geography, Science and philosophy of Geography, The basic concepts of Geography, Techniques and tools in Geography, Different branches of Geography, Aspects of study and Relationship with other Sciences
- Describe Geography in classical times: Greek and Roman Geographers, Contribution by Arab Geographers, Renaissance, Eighteenth century Geography, Classical period of Geography
- Discuss Formulation of scientific Geography, Schools of thought; German, French, Environmental determinism, possibilism, Neo-determinism and probabilism, British, American and former Soviet Union
- Describe Dualism in Geography, Dichotomism of scientific and regional Geography; Unity in Geography, Recent Trends in Geography

PAPER II- OCEANOGRAPHY (GUGP-502(a))

• **Max. Marks: 50**

• **Lecture-04**

• **Term End Exam: 35, Internal Assessment: 15**

• **Learning Outcomes: On completion of the course, the student will be able to**

- Define concept, scope and development of Oceanography, describe Distribution of water over the globe
- Map Relief of the ocean floor, Continental drift and ocean floor spreading, Composition of sea water
- Discuss Temperature in oceans, Salinity, density and water masses in oceans, Marine deposits
- Map and analyze Coral landforms, Waves and tides, Ocean currents, Marine life

PAPER II- AGRICULTURAL GEOGRAPHY (GUGP-502(b))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Define Nature, scope, significance and development of Agriculture Geography, describe Approaches to the study of Agricultural Geography: Commodity, systematic, regional, behavioural and recent approaches etc., Origin and dispersal of agriculture
- Describe Determinants of agricultural land use: Physical, economic, social, and technological, Land holding and land tenure systems, Agricultural efficiency Concepts, Techniques and Methods of measurements; Methods of delimiting crop combination, cropping pattern, crop concentration, intensity of cropping, degree of commercialization, diversification and specialization
- Explain Theories of Agriculture Geography, von Thunen's theory (model) of agricultural location and its recent modifications, Demarcation of Agricultural regions, Whittlesey's classification of agricultural regions; Land use and land capability
- Describe Regional pattern of productivity in India, Green Revolution, White Revolution, Food deficit and food surplus regions; World pattern of Agriculture: Subsistence agriculture, Commercial farming, Plantation agriculture, Mixed agriculture, State, collective and cooperative farming

PAPER II- POPULATION GEOGRAPHY (GUGP-502(c))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Describe Nature, Scope and Development of Population Geography; Source and Types of Population Data: Census, Sample Survey and Vital Registration System; Theories of Population: Classical and Modern
- Analyze World Population: Growth, Causes and Consequences; Factors Affecting Population Distribution; Demographic Transition Theory; Migration Types and Determinants
- Discuss Population Characteristics: fertility and Mortality; Age and Sex Structure; Occupational Structure; Human Resource Development and Human Development Index; Urbanization
- Map Population Resource Region of India; Population Growth and Distribution in India; Density Types; Population Problems and Population Policy in India

PAPER III- PRACTICAL- PROJACTION (GUGP-P-503)

Max. Marks: 50

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -NA, Viva Voce-10, Record File- 10

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

- Define and understand of map projection, Necessity of map projections, Mathematical method of drawing projection, Classification of map-projections
- Construct map projections: Simple conical projection with one and two standard parallels, Bonne's projection, Polyconic projection
- Construct Cylindrical projections: Equidistant and Equal area cylindrical projections, Mercator's, Gall's stereographic projection
- Construct Zenithal Projections: Polar zenithal equidistant, Equatorial zenithal equidistant, Polar zenithal equal-area, Equatorial zenithal equal area

SEMESTER-VI (July 2019 onwards)

PAPER I- ECONOMIC GEOGRAPHY (GUGP-601)

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Define concept, aim and scope of economic geography, Resources, classify resources, describe conservation and concepts, Economic landscapes
- Analyze Primary production, Vegetation & forest economy, Soil resources, Mineral resources, Power resources, describe Resource conservation
- Define and map Agricultural regions, describe Principle crops, Theory of agriculture location, Theory of industrial location and industrial regions, Major industries
- Describe World transportation, International trade, patterns and trends, Major trade blocks, Globalization and developing countries

PAPER II- REGIONAL PLANNING AND DEVELOPMENT (GUGP-602(a))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Define Regional concept in geography; Concept, Scope and purpose of Regional planning, classify regions
- Describe Regional Planning: Planning process - sectoral, temporal and spatial dimensions; short term and long-term perspective planning, Indicators of development and their data sources, measuring levels of regional development and disparities, Planning for a region's development and multi-regional planning in a national context
- Describe Regional development strategies: Concentration vs. dispersal, Case studies for plans of developed and developing countries, Regional planning in India, Regional development in India: problems and prospects, Regional disparities: causes and consequences

- Analyze Concept of Multi-level planning: Decentralized planning; people's participation in the planning process, Concept and approaches of urban development, Landscape ecology and sustainable urban development, Application of remote sensing and Geographic Information System in Development Planning

PAPER II- POLITICAL GEOGRAPHY (GUGP-602(b))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Define basic concepts and scope of Political Geography; Describe Politics, Geopolitics; History and Development, Approaches of Political Geography.
- Discuss Concept of Nation, State and Nation-State; Geographic Characteristics of States: Size, Shape, Location, Cores and Capitals; Nation Building/Nationalism; Define Frontier and Boundaries; Differentiate Between Frontier and Boundaries; classify Boundaries and describe their Role and Importance in States Functioning.
- Describe Global Geo-politics; Interpret Mahan, Mackinder, Spykman and Seversky with Other Views Related to Heartland and Rimland.
- Describe Political Geography of India; Resource Development and Power Politics; Geopolitical Study of Indian Ocean; Political Geography of SAARC Region; Electoral Geography.

PAPER II- GEOGRAPHY OF TOURISM (GUGP-602(c))

- **Max. Marks: 50**
- **Lecture-04**
- **Term End Exam: 35, Internal Assessment: 15**
- **Learning Outcomes: On completion of the course, the student will be able to**
- Define fundamental Concepts, classify Tourism; Describe Resources and Infrastructure for Tourism
- Assess Physical, Economical, Social and Cultural Impacts of Tourism; Describe Concept of Ecotourism, and New Emerging Trends in Tourism
- Discuss Tourism Marketing; Describe the Tourist Product, Tourism Circuits, Tour Agencies Describe Globalization and Tourism; Tourism in India; Resource and Growth; National Tourism Policy in India; Tourism Organizations. Tourism in Uttarakhand: Policies and

PAPER III- PRACTICAL- STATISTICAL TECHNIQUES AND GEOINFORMATICS (GUGP-P-603)

Max. Marks: 50

Lecture-06 Practical

Practical: Lab Work- 30, Survey Camp -10, Viva Voce-05, Record File- 05

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

- Elucidate Types of data, Collection of data, Methods of sampling, Measures of central tendency
- Analyze Measures of dispersion, Correlation Coefficient

- Explain Components of remote sensing, Platform and sensors Ground truth, Elements of image interpretation; Image processing techniques: Visual and digital, Geometric and Radiometric corrections, Restoration; Enhancement and Classification: supervised and unsupervised
- Perform Geo-referencing, explain Spatial and Non-spatial data; Raster and Vector models for geographic data representation, Linkages and Matching, Principal Functions of GIS; Data Capture; Geographic Analysis; Scanning System; Data Conversion, Data Base Management System (DBMS); Geo-Relational Data Model; Topological Data Structure; Attribute Data Management; Relational Database - Concepts and Model, Digital Elevation Model (DEM)

**POST GRADUATE (M. A/M.Sc)
SEMESTER COURSE FRAMEWORK**

SEMESTER-I (2019 Onwards)

Code: 101 (GM P-CCM –i)

PAPER I- ADVANCED PHYSICAL GEOGRAPHY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- The students will be familiar with the earth's interior.
- Develop an idea about earth movements and the related topography.
- Acquire knowledge about different types of rock and their origin. Influence of the rocks on land form and topography.
- Getting familiar with the concept of hydrology
- Understanding the processes of erosion, deposition and resulting landforms.
- This course will familiarize students to the basic understanding of the constituents of Information Technology.
- The intention is to lay the foundation for the core subjects.
- To polish their practical knowledge in office automation tool.
- Describe, Meaning, Scope and Branches of Physical Geography, Explain the Origin of the earth, Interior of the earth, Rocks
- Interpret Origin of continents and ocean basins and related theories, and describe Mountains, Plateau and Plains, Gradational processes, Weathering and Erosion.
- Analyze Composition and structure of atmosphere, Isolation, Vertical and Horizontal Distribution of atmospheric temperature, Pressure and pressure belts, Winds: Planetary, Periodic and Local.
- Describe Ocean bottom topography, Ocean deposits, Salinity, Temperature, Ocean currents, Tides and Coral reefs

SEMESTER –I

Code: 102 (GM P-CCM –ii)

PAPER II- NATURAL RESOURCE MANAGEMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Describe ecological processes, including human impacts that influence ecosystems change, natural succession and the future sustainability of natural resources.
- Characterize natural resources and be able to quantify at least one of these resources.
- Envision desired future conditions in an area to achieve a set of natural resource-related objectives, prescribe management actions needed to achieve those objectives, and evaluate success of these actions.

- Describe how the use, management and allocation of natural resources are affected by: laws, policies, economic factors (both market and non-market), and characteristics (including demographic, cultural, ethnic, and "values" differences) of private and public resource owners and users.
- Communicate effectively, orally and in writing, with audiences of diverse backgrounds.
- Work effectively with, and within, interdisciplinary and diverse groups to resolve management problems and achieve management objectives.

SEMESTER – I

Code: 103 (GMP-CCM – iii)

PAPER III- ADVANCED GEOGRAPHY OF INDIA

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Identifying and explaining the Indian Geographical Environment, from global to local scales.
- Applying geographical knowledge to everyday living.
- Applying knowledge of global issues to a unique scientific problem.
- Showing an awareness and responsibility for the environment and India.
- Evaluating the impacts of human activities on natural environments special reference to India
- Students will get an introduction to the main regions of the India in terms of both their uniqueness and similarities.
- Students will be exposed to historical, economic, cultural, social and physical characteristics of India.
- Students will learn the relationships between the global, the regional and the local, particularly how places are inserted in regional and global processes.
- In addition to the ability of understanding and reading maps, students will develop cartography skills and will be able to create maps on their own.
- Students will be introduced to demographic, social and cultural attributes such as migration, social relations and cultural identity.

SEMESTER –I

Code: 104 (GMP-EC–i)

PAPER IV (a)-SOIL GEOGRAPHY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Define soil and understand the importance of soil.
- Apply math, science, and technology in the field of soil resource Engineering
- They will learn some strategies of soil resource management

- Explain why plants need soil.
- Be familiar with how soil layers are formed.
- Explain moisture retention capabilities of the three major soil particles.
- List and describe functions of soil.
- Describe ways soil can be enriched

SEMESTER – I
Code: 105 (GMP-EC - ii)
PAPER IV (b)-GEOGRAPHY OF TOURISM

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Understand and explain how the different geographies of tourism are created, maintained, and utilized in the modern world.
- Evaluate the impacts of tourism on present and future economies, cultures, societies, and physical environments.
- Define fundamental Concepts, classify Tourism; Describe Resources and Infrastructure for Tourism
- Assess Physical, Economical, Social and Cultural Impacts of Tourism; Describe Concept of Ecotourism, and New Emerging Trends in Tourism
- Discuss Tourism Marketing; Describe the Tourist Product, Tourism Circuits, Tour Agencies
- Describe Globalization and Tourism; Tourism in India; Resource and Growth; National Tourism Policy in India; Tourism Organizations. Tourism in Uttarakhand: Policies and

SEMESTER –I
Code: 106 (GMP –EC–iii)
**PAPER IV (c)-INTEGRATED MOUNTAIN DEVELOPMENT WITH SPECIAL
 REFERENCETO THE INDIAN HIMALAYA**

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- The epistemography of mountains as a research theme,
- The biogeography of mountain biodiversity,
- The geoecology of mountain societies,
- The case studies of water usage in orobiomes,
- The advances in ethnoecology research and mountain cultures,
- The urbanization of mountain areas and associated environmental impacts,

- The influence of globalization in socioeconomic scenarios of mountains, and
- The pathways for sustainable mountain development.

SEMESTER – I
Code: 107 (GMP - CCm –i):
DISSERTATION (MINOR)

Total Marks Allotted for Dissertation: 25

Evaluation by External Examiner: 10

Evaluation by Internal Examiner: 10

Viva – Voce Examination: 05

Learning Outcomes:

- Apply knowledge and develop skills further in quantitative and/or qualitative research procedures
- Research and process primary and/or secondary datasets for analysis (this may involve field research)
- Demonstrate ability to synthesise information and analytically process data
- Effectively time manage research progress to become an efficient independent learner
- Summarise key findings for presentation to academics and peers (poster format)
- Produce a final thesis within the allocated word limit which holistically presents findings in a well-structured, academically professional and self-critical format

SEMESTER – I
Code: 108 (GMP - CCm–ii):
SEMINAR/ PRESENTATION

Total Marks: 25

- Distinguish the multiple senses of a text (literal and beyond the literal).
- Identify and understand assumptions, theses, and arguments that exist in the work of authors.
- Evaluate and synthesize evidence in order to draw conclusions consistent with the text. Seek and identify confirming and opposing evidence relevant to original and existing theses.
- Ask meaningful questions and originate plausible theses.
- Critique and question the authority of texts, and explore the implications of those texts.

SEMESTER – I
Code: 109& 110 (GMP - P-i & P-ii)
PRACTICAL-: TOPOGRAPHICAL ANALYSIS AND INTERPRETATION
OF GEOLOGICAL MAPS (Pi); AND FIELD SURVEY (Pii)

Term End Exam: Marks: 60

Record Work: Marks: 10

Viva Voce: Marks: 10

Field Survey: Marks: 20

- Reading and classifying Indian topographical maps
- Interpretation of topographical maps and preparation of base map, index map, drainage map, orographic map
- Interpretation of topographical maps and preparation of land use map, settlement map and transport network map.
- Reading Indian weather maps: Their interpretation and preparation of weather report

SEMESTER – II (2019 Onwards)
Code: 201 (GMP-CCM – i)
PAPER I- ADVANCED GEOMORPHOLOGY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Describing human-environment, and nature-society interactions as well as global human and environmental issues.
- Identifying and explaining the planet's human and physical characteristics and processes, from global to local scales.
- . Evaluating the impacts of human activities on natural environments.
- Applying knowledge of global issues to local circumstances to evaluate the local effects of the issues.
- Showing an awareness and responsibility for the environment.

SEMESTER – II
Code: 202 (GMP-CCM-ii)
PAPER II- URBAN ENVIRONMENT AND PLANNING

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Students will acquire a solid base of knowledge in the principles and practices of learning, including urban spatial structure, local public finance, and economics of development, infrastructure provision, and globalization.
- Students will develop the skills necessary for the effective practice of planning, including its purpose, meaning and history; methods that envision future change; elements of plans; adoption, administration, and implementation of plans; speaking for the disadvantaged; laws and policies of environmental planning.
- Students will develop the values necessary for the effective practice of planning, including problem-solving skills; research skills; written, graphical, and oral skills; computational skills; collaboration with peers; meeting professional standards; forecasting and scenarios; implementation of plans; working with diverse communities.

- Students will learn the values and ethical standards affecting the practice of planning, including the values of justice, equity, fairness, efficiency, order, and beauty; the values of fair representation and equal opportunity; and respecting complex legacies.

SEMESTER – II

Code: 203 (GMP-CCM – iii)

PAPER III -EVOLUTION AND DEVELOPMENT OF GEOGRAPHICAL THOUGHT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Main objectives of this course are to acquaint the students with the philosophy.
- Also teach the Methodology and historical development of geography as a professional field.
- The idea is to address the spirit and purpose of the changing geographies and to what we as geographers contribute towards knowledge production.
- The course aims at developing critical thinking and analytical approaches.
- Students will acquire an understanding of and appreciation for the relationship between geography and culture.

SEMESTER – II

Code: 204 (GMP-EC – i)

PAPER IV (a)- REMOTE SENSING APPLICATIONS

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Students will demonstrate knowledge of the foundations and theories of geographic information systems (GIS) and use the tools and methods of GIS.
- Students will demonstrate their knowledge of physical geography and the methods and techniques for observing, measuring, recording and reporting on geographic phenomena.
- Students will demonstrate their competence to work individually and as a team to develop and present a client-driven GIS solution.
- Student will be familiar with modern techniques in Geography.
- Students will be prepared to apply their skills in professional careers

SEMESTER – II

Code: 205 (GMP-EC – ii)

PAPER IV (b)-WORLD REGIONAL GEOGRAPHY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Understand the use of maps/geo-technologies to explain geographic phenomena and patterns as they relate to world regions and their interrelationships.
- Apply geographic concepts to the study of regions or a specific region.
- Be able to compare and contrast human and physical patterns and their variations over space.
- Develop an appreciation of the complexities of regional and global environmental and socio-economic problems.
- Understand the concept of globalization and be able to place local issues in their global and historical context.
- Understand human-environment interactions in various regions around the world.
- Students completing the course will perform the outcomes listed below.
- Identify the major areas of the physical earth on which they live and the peoples with whom they must share the earth.
- Recognize the natural forces that effect the earths' form and function.
- Utilize accurate vocabulary in describing the earth's geography.
- Interpret current events in the light of the geography of the earth.
- Identify and describe the earths' regions in terms of population, culture, environment, geopolitical framework, and economic development

SEMESTER – II

Code: 206 (GMP-EC - iii)

PAPER IV (c)-BASES OF HYDROLOGY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- At the end of the semester students will different physical aspects of water as a natural resource.
- They will learn some strategies of water resource management.
- Learn Also about the conservation of water.
- Students can compute critical flow and critical depth in floodplain hydraulics.
- Students can delineate watersheds and stream polylines from digital elevation data.
- Students comprehend the physics of water flow and mass (e.g., solute) transport processes, can represent those processes with mass, momentum and energy conservation equations, and apply those equations in assessing water quantity and quality in surface- and ground-water systems.
- Students comprehend statistical, analytical and numerical methods and associated limitations of modeling hydrologic flow and transport processes, and can apply quantitative models towards the analysis of water quantity, quality and management problems.

- Students comprehend basic water properties and can measure basic physical and biochemical aspects of water associated with hydrologic processes.
- Students comprehend the hydrologic cycle and related major water quantity and quality challenges and their relevance to human health and well-being, ecosystems, and the food supply.

SEMESTER – II

Code: 207 (GMP - CCm –i):

DISSERTATION (MINOR)

Total Marks Allotted for Dissertation: 25

Evaluation by External Examiner: 10

Evaluation by Internal Examiner: 10

Viva – Voce Examination: 05

Learning Outcomes:

- Apply knowledge and develop skills further in quantitative and/or qualitative research procedures
- Research and process primary and/or secondary datasets for analysis (this may involve field research)
- Demonstrate ability to synthesise information and analytically process data
- Effectively time manage research progress to become an efficient independent learner
- Summarise key findings for presentation to academics and peers (poster format)
- Produce a final thesis within the allocated word limit which holistically presents findings in a well-structured, academically professional and self-critical format

SEMESTER – II

Code: 208 (GMP - CCm–ii):

SEMINAR/ PRESENTATION

Total Marks: 25

- Distinguish the multiple senses of a text (literal and beyond the literal).
- Identify and understand assumptions, theses, and arguments that exist in the work of authors.
- Evaluate and synthesize evidence in order to draw conclusions consistent with the text. Seek and identify confirming and opposing evidence relevant to original and existing theses.
- Ask meaningful questions and originate plausible theses.
- Critique and question the authority of texts, and explore the implications of those texts.

SEMESTER – II

Code: 209& 210 (GMP - P-i & P-ii)

PRACTICAL-: Quantitative Techniques and Cartographic Representation of Geographical Data (GMP-P-i) &(ii) Field Survey (GMP-P-ii)

Term End Exam: Marks: 60

Record Work: Marks: 10

Viva Voce: Marks: 10

Field Survey: Marks: 20

- Keeping in view the nature of data and purpose of study, students would be able to make a rational choice amongst listed various statistical methods.
- Demonstrate understanding of basic concepts of probability and statistics embedded in their courses.
- Show proficiency in basic statistical skills embedded in their courses.
- Students shall know how to organize, manage, and present data.
- Students shall know how to organize, manage, and present data.
- Demonstrate ability to write reports of the results of statistical analyses giving summaries and conclusions using nontechnical language.

SEMESTER –III

Code: 301 (GM P-CCM –i)

PAPER I- ENVIRONMENTAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- provide definitions of environment, management, systems and organisations in relation to environmental management
- describe organisations as systems and their role in environmental management
- understand the usefulness of systems thinking in relation to environmental management in organisations
- explain how environmental management can be used as environmental protection and how organisations can define and manage risk.
- Demonstrate an understanding of comprehensive systemic analysis across both physical and behavioral dimensions involving society, the environment, and the economy.
- Define sustainability and assess the ways that sustainability topics are approached by a diversity of academic disciplines.
- Identify how globalized processes impact socioecological systems.
- Analyze the role of environmental sustainability in the promotion of comprehensive justice and equity.
- Apply critical thinking skills to provide sustainable solutions and build resilient communities.
- Utilize the appropriate methodological tools to analyze and address specific research questions.
- Articulate a comprehensive world view that integrates diverse approaches to sustainability.

- Understand the basic theoretical concepts and methodologies of both the physical and social sciences.
- Learn how to solve large-scale problems using a multitude of tools and approaches.
- Understand the basic sustainability concepts of homeostasis, carrying-capacity, cradle-to-grave recycling, evolutionary processes, inter-generational debt, socio-political adaptation, climate change, ecosystem services, and environmental justice—and understand the relationships between them.
-

SEMESTER –III

Code: 302 (GM P-CCM –ii)

PAPER II- AGRICULTURAL GEOGRAPHY AND AGROECOSYSTEM MANAGEMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- Define Nature, scope, significance and development of Agriculture Geography, describe Approaches to the study of Agricultural Geography: Commodity, systematic, regional, behavioural and recent approaches etc., Origin and dispersal of agriculture
- Describe Determinants of agricultural land use: Physical, economic, social, and technological, Land holding and land tenure systems, Agricultural efficiency Concepts, Techniques and Methods of measurements; Methods of delimiting crop combination, cropping pattern, crop concentration, intensity of cropping, degree of commercialization, diversification and specialization
- Explain Theories of Agriculture Geography, von Thunen's theory (model) of agricultural location and its recent modifications, Demarcation of Agricultural regions, Whittlesey's classification of agricultural regions; Land use and land capability
- Describe Regional pattern of productivity in India, Green Revolution, White Revolution, Food deficit and food surplus regions; World pattern of Agriculture: Subsistence agriculture, Commercial farming, Plantation agriculture, Mixed agriculture, State, collective and cooperative farming

SEMESTER – III

Code: 303 (GMP-CCM – iii)

PAPER III- RURAL DEVELOPMENT PLANNING

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- demonstrate knowledge and understanding of past and contemporary issues pertaining to rural development and livelihoods, including different definitions of rurality, as well as theories and frameworks for understanding urban and rural livelihoods and development, and the interaction between the two in developing countries;
- apply their knowledge and understanding, and problem-solving abilities, to independently identify rural development issues from a geographical perspective;
- demonstrate an ability to critically and systematically integrate knowledge, to analyse and assess complex phenomena and issues in the fields of rural development and rural livelihoods;
- critically analyse the empirical and theoretical connections between rural development;
- identify and analyse specific urban and rural development needs; and
- demonstrate an ability to clearly present and discuss conclusions, and the arguments behind them, orally and in writing.

SEMESTER –I

Code: 104 (GMP-EC–i)

PAPER IV (a)- CLIMATE CHANGE, IMPACTS AND ADAPTATION IN HIMALAYA

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- understand the physical basis of the natural greenhouse effect, including the meaning of the term radiative forcing
- know something of the way various human activities are increasing emissions of the natural greenhouse gases, and are also contributing to sulphate aerosols in the troposphere
- demonstrate an awareness of the difficulties involved in the detection of any unusual global warming ‘signal’ above the ‘background noise’ of natural variability in the Earth's climate and of attributing (in whole or in part) any such signal to human activity
- understand that although a growing scientific consensus has become established through the IPCC, the complexities and uncertainties of the science provide opportunity for climate sceptics to challenge the Panel's findings.
- understand the current evidence for global warming
- model and apply the techniques of ‘measuring’ the Earth's temperature
- understand the current warming in relation to climate changes throughout the Earth's history
- explain factors forcing climate change, and the extent of anthropogenic influence
- assess the ‘best predictions’ of current climate models.

SEMESTER – III
Code: 305 (GMP-EC - ii)
PAPER IV (b)- SOCIAL AND CULTURAL GEOGRAPHY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Students will develop a solid understanding of the concepts of “space,” “place” and “region” and their importance in explaining world affairs.
- Students will understand general demographic principles and their patterns at regional and global scales.
- Students will be able to locate on a map major physical features, cultural regions, and individual states and urban centers.
- Students will understand global and regional patterns of cultural, political and economic institutions, and their effects on the preservation, use and exploitation of natural resources and landscapes.
- Understand the nature, scope, and concept, relationship between culture and social environment, and right of information act.
- To examining the cultural complex and traits of culture and its concepts.
- Evolution to civilization and various cultural development and cultural system according to religion, language and geography, and global cultural changes.
- To study the origin and growth of culture and agriculture and its basic concepts.
- Understand the concept of space and social process and present status.
-

SEMESTER –III
Code: 106 (GMP –EC–iii)
PAPER IV (c)- GLACIAL GEOMORPHOLOGY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Identifying, interpreting, and applying appropriate methods of geologic dating such as early methods of index fossils and stratigraphic sequences and recent methods using radioactive isotopes to determine how many years ago a given rock sample was formed.
- Identifying the major physical events in each of the geologic eras such as the building of mountain chains and the shifting of entire continents.
- Explaining how geologic structures are a dominant control in the evolution of various landforms.
- Evaluating how a geomorphic process controls the development of distinctive landforms.
- Differentiating between monocyclic landscape and multicycle landscape.
- Indicating the age of most of the world’s features and the reason for the common age.

- Analyzing how the development of present day land forms have been influenced by climatic changes and geological activity of the Pleistocene.

SEMESTER – III
Code: 307 (GMP - CCm –i):
DISSERTATION (MINOR)

Total Marks Allotted for Dissertation: 25

Evaluation by External Examiner: 10

Evaluation by Internal Examiner: 10

Viva – Voce Examination: 05

Learning Outcomes:

- Describe a relevant area of career development, career coaching, coaching or work-related learning studies.
- Identify research methods.
- State research questions.
- Identify literature for review.
- Critically analyse and evaluate the knowledge and understanding in relation to the agreed area of study.

SEMESTER – III
Code: 308 (GMP - CCm–ii):
SEMINAR/ PRESENTATION

Total Marks: 25

- In terms of **content**, students will be able to show competence in identifying relevant information, defining and explaining topics under discussion
- Students will be able to judge when to speak and how much to say, speak clearly and audibly in a manner appropriate to the subject, ask appropriate questions, use evidence to support claims, respond to a range of questions, take part in meaningful discussion to reach a shared understanding, speak with or without notes, show depth of understanding, demonstrate breadth of reading, use primary and secondary sources, show independence and flexibility of thought, help discussions to move forward, show intellectual leadership and effective time management.
- Students will demonstrate that they have paid close attention to what others say and can respond constructively. Through listening attentively, they will be able to build on discussion fruitfully, supporting and connecting with other discussants.
- Students will develop persuasive speech, present information in a compelling, well-structured, and logical sequence, respond respectfully to opposing ideas, show depth of knowledge of complex subjects, and develop their ability to synthesize, evaluate and reflect on information.

- Through asking appropriate questions, students will demonstrate their understanding of discussions and spark further discussion.
- Students will be able to reach across diverse disciplines to apply theories, methods and knowledge bases from multiple fields to a single question or problem. They will be able to integrate schools of thought from several established fields into their discussion of a topic in order to show a well-rounded understanding.
- Students will engage with important questions that stimulate discussion and debate. While there is a great deal of diversity of subject matter in CSEM, many of the courses focus on ethical, cultural, and moral questions, on questions that enable students to reflect on themselves and on their place in society, and on questions that serve a public or civic purpose.
- Students will engage with works that are widely held to be significant in the field of study, while recognizing cultural diversity and the ever-changing nature of what is regarded as important.

SEMESTER – III

Code: 309& 210 (GMP - P-i & P-ii)

PRACTICAL-: SURVEYING AND MAP PROJECTION (Pi); AND FIELD SURVEY (Pii)

Term End Exam: Marks: 60

Record Work: Marks: 10

Viva Voce: Marks: 10

Field Survey: Marks: 20

- To learn drawing of Scale Diagram for representing geographical data.
- Skill of drawing of map, grapes, diagrams scale.
- Get skill of Drawing of projection.
- Aquaria knowledge of map making techniques.
- To understand to choose of projection according purpose of making maps.

SEMESTER – IV (2019 Onwards)

Code: 401 (GMP-CCM – i)

PAPER I- ADVANCED GEOGRAPHY OF UTTARAKHAND

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Understand the location, geostrategic importance, characteristics of size of Uttarakhand
- To examine the physiographic features of Uttarakhand
- To understand climatic variations, types of soil and vegetation and their problems.

- To extract and understand the natural resources, energy and mineral resources
- Understand to agricultural activities, patterns, regions, problems and prospect, and some important issues related to Uttarakhand.

SEMESTER –IV

Code: 402 (GM P-CCM –ii)

PAPER II- POPULATION GEOGRAPHY AND HUMAN RESOURCE DEVELOPMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- Understand the Nature and Scope of Population Geography and their evolution, significance and approaches for the study.
- Understand the Sources of Population Data and History of World Population and some factors responsible for world population and data sources for study.
- To understand the fundamental Concepts Related to Population such as density, over, optimum & under population, fertility, mortality and population for future perspectives.
- To review and understand the subject matter with the help of Theories of Population
- Fundamental/Basic Statistical Analysis using Statistical Software MS-Excel
- Understand the Population Movement, Migration and some causes, consequences and its effects.
- Understand the Nature and Scope of Settlement Geography Characteristics of Rural and Urban Settlements according to Indian Census and nature, scope, evolution and study methods.
- Understand the history of population
- Understand the types of data
- Study of distribution and density of population.
- Get knowledge of population theories

SEMESTER – IV

Code:403 (GMP-CCM – iii)

PAPER III- BIOGEOGRAPHY

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 per week

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

- To introduce the student to the concept of biogeography.
- To introduce the components, interpretation and application of biogeography.
- Interaction between living organisms and non-living organisms.
- Living organisms with climate and physical environment.
- Know about biogeochemical cycle.

- To describe main theories underlying biogeographical research.
- To describe the historical factors that influence current species distributions.
- To describe processes such as extinctions, biological invasions, and dispersal in explaining biogeographical patterns
- To apply biogeographical concepts to a wide range of environmental problems

SEMESTER –IV

Code: 404 (GMP-EC–i)

PAPER IV (a)- INTEGRATED WATERSHED MANAGEMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Understand the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of watershed according to area and shape
- Study about the physical parameters of watershed, channel geometry and basi morphology.
- Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage.
- Understand the watershed development planning and sample of watershed management and planning for appropriate development of watershed management for water conservation and development.

SEMESTER – IV

Code: 405 (GMP-EC - ii)

PAPER IV (b)- GIS AND GPS APPLICATIONS

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- To Develops Skill of soil and water analysis techniques.
- To Suggests fertilizers to the crops according soil analysis.
- Understand the introduction of GIS software's special reference of ILWIS, to examining the types of GIS software and applications, introduction of menu, tools, page layout and setting, scanning image, import of image in the software.
- To study and understand the image registration and its analysis done in software.
- To understand and prepare the topology of point, line and polygon and understand non spatial data analysis.
- To prepare the different kinds of map using GIS software and also create the profile of relief representation.
- To understand the GPS and its functions, work, types and components for filed survey and make project report using both GPS and GIS software.

SEMESTER –IV
Code: 406 (GMP –EC–iii)
PAPER IV (c)- DISASTER MANAGEMENT

Max. Marks: 100

Term End Exam. Marks: 75

Internal Assessment Marks: 25

Lecture-04 par week

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

- Describe the four phases of emergency management and the role each of them plays in managing and mitigating a disaster.
- Delineate the role terrorism plays on society and how it impacts public policy and decision making
- Demonstrate the skills needed to effectively manage a disaster scene.
- List the resources needed and how to obtain those resources effectively mitigate disaster damage
- Describe the various emergencies in public health and the organization needed to reduce the threat to the public and mitigate pain and suffering of society
- List the psychological damage caused by disasters to both the civilian and the first responder and how to mitigate the effects of those disasters
- Recognize and identify the needs for an effective training program in emergency management
- Identify the core requirements to effective planning
- Demonstrate how to perform a risk analysis
- Describe the effective way to make decisions and problem solve during an emergency
- Prepare students to be future leaders in the Emergency Response fields
- List the methods of communication during a disaster and the reasons for using each one
- Have the graduate be an affective member of the incident command team at a disaster or crisis.
- Meet the Presidential Directive of having employees in emergency service professions trained in the Incident Management System

SEMESTER – IV
Code: 407 (GMP - CCm –i):
DISSERTATION (MAJOR)

Total Marks Allotted for Dissertation: 75

Evaluation by External Examiner: 25

Evaluation by Internal Examiner: 25

Viva – Voce Examination: 25

Learning Outcomes:

- encourage deeper understanding of the knowledge, skills and attributes required to earn a credential (degree), which could support:
- potential students in making decisions about what program / degree may most suit their goals and expectations;
- current students by making often implicit expectations more explicit
- graduates in describing their skills to potential employers;
- employers in recognizing the skills an applicant would possess, as a graduate of that program; and
- support students and supervisors in determining areas where a student is meeting or has yet to meet learning outcomes required by their program and develop / modify growth plans accordingly;
- help students to take ownership over their learning and recognize how their coursework, professional development, independent work, and other experiences can help them to develop and integrate knowledge and competencies necessary for success in their field as well as meet the requirements of their program;
- increase clarity of how program outcomes and assessment are aligned.

SEMESTER – IV
Code: 408 (GMP - CCm–ii):
SEMINAR/ PRESENTATION

Total Marks: 25

- In terms of **content**, students will be able to show competence in identifying relevant information, defining and explaining topics under discussion
- Students will be able to judge when to speak and how much to say, speak clearly and audibly in a manner appropriate to the subject, ask appropriate questions, use evidence to support claims, respond to a range of questions, take part in meaningful discussion to reach a shared understanding, speak with or without notes, show depth of understanding, demonstrate breadth of reading, use primary and secondary sources, show independence and flexibility of thought, help discussions to move forward, show intellectual leadership and effective time management.
- Students will demonstrate that they have paid close attention to what others say and can respond constructively. Through listening attentively, they will be able to build on discussion fruitfully, supporting and connecting with other discussants.

- Students will develop persuasive speech, present information in a compelling, well-structured, and logical sequence, respond respectfully to opposing ideas, show depth of knowledge of complex subjects, and develop their ability to synthesize, evaluate and reflect on information.
- Through asking appropriate questions, students will demonstrate their understanding of discussions and spark further discussion.
- Students will be able to reach across diverse disciplines to apply theories, methods and knowledge bases from multiple fields to a single question or problem. They will be able to integrate schools of thought from several established fields into their discussion of a topic in order to show a well-rounded understanding.
- Students will engage with important questions that stimulate discussion and debate. While there is a great deal of diversity of subject matter in CSEM, many of the courses focus on ethical, cultural, and moral questions, on questions that enable students to reflect on themselves and on their place in society, and on questions that serve a public or civic purpose.
- Students will engage with works that are widely held to be significant in the field of study, while recognizing cultural diversity and the ever-changing nature of what is regarded as important.

SEMESTER – IV

Code: 409& 410 (GMP - P-i & P-ii)

(i) Surveying, Interpretation of Geological Maps and Spatial Analysis (GMP-P-i) &(ii) Field Survey (GMP-P-ii)

Term End Exam: Marks: 60

Record Work: Marks: 10

Viva Voce: Marks: 10

Field Survey: Marks: 20

- Understand the different surviving techniques.
- Knowledge about preparation of layout.
- Understand the socio-economic condition of the villages.
- Acquire knowledge of preparation of drawing of profile with the help of Dumpy level, Telescopic Alidade, Abney level and Sextant.

Ph.D. Programme

In both the campuses the department conducts Ph.D. Programmes. For Ph.D. programme as per the UGC norms the student has to clear the six months Research Methodology course. The detail structure of the Research Methodology is given below.

PAPER –I Research Methodology

Total Marks: 100

Internal Marks: 25

External Marks: 75

- Examining the introduction of research, motivation in research, types of research, significance of research, research process and criteria of good research.
- To understand the research problems, selecting research problems, literature review and to study the hypothesis, its types, sources, formation of hypothesis and utility of hypothesis in scientific research.
- To understand the research design, need, features, basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design.
- Study about type's data and methods of data collection and study the processing and analysis of data using different statistical methods.
- Understand the interpretation and report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report.

PAPER –II Recent Advances in Subject (Geography)

Total Marks: 100

Internal Marks: 25

External Marks: 75

- outline the nature of geographical concepts and the enquiry approach, and explain their significance in geographical learning
- explain modes of creativity and the stages of the 'creative' process in geographical teaching and learning
- define controversial issues and explain their significance in geographical education
- relate personal views of teaching and learning to those presented
- Use different resources and approaches to support students' learning.

PAPER –III Dissertation

Total Marks: 100

Internal Marks: 25

External Marks: 75

- encourage deeper understanding of the knowledge, skills and attributes required to earn a credential (degree), which could support:
- potential students in making decisions about what program / degree may most suit their goals and expectations;
- current students by making often implicit expectations more explicit
- graduates in describing their skills to potential employers;
- employers in recognizing the skills an applicant would possess, as a graduate of that program; and
- support students and supervisors in determining areas where a student is meeting or has yet to meet learning outcomes required by their program and develop / modify growth plans accordingly;
- help students to take ownership over their learning and recognize how their coursework, professional development, independent work, and other experiences can help them to develop and integrate knowledge and competencies necessary for success in their field as well as meet the requirements of their program;
- increase clarity of how program outcomes and assessment are aligned.

Doctor of Philosophy (PhD) program learning outcomes

- Students will have met the objectives for learning outcomes in an undergraduate Discipline relevant to their graduate field of study.
 - Students will be able to summarize major themes and current research problems in their area of specialization.
 - Students will be able to communicate the major tenets of their field and their Work orally and in writing for students, peers and the lay public.
 - Students will be able to identify areas where ethical issues may arise in their work Or discipline, and articulate strategies for dealing with ethical issues in the profession.
 - Students will be able to explain and identify open problems and areas needing Development in their fields.
 - Students will have carried out and presented an original work of research in their discipline.
-

Department of Botany

D.S.B. Campus, Kumaun University, Nainital
(Vision, Mission, PEO, PO, PSO & CO)

Vision:

To promote the culture of learning by educating students in the basics of plant science, its related components, and evolving advancements that will serve science and the nation in the twenty-first century.

Mission:

1. To make a significant contribution to the national goals of promoting knowledge society through high quality education, innovative-research and services to the society in the field of plant sciences.
2. To produce highly qualified post graduate and Ph.D. students in the field of plant sciences that serve in academic and research institutions.
3. To serve the society's needs and contribute to transform the society into a knowledge society.

Program educational objectives (PEOs):

PEO-1: Enable graduates to pursue post graduate studies in botany and succeed in academic and research careers.

PEO-2: Possess essential professional plant science skills that make them confident to synthesise and apply knowledge in various application domains.

PEO-3: Demonstrate an understanding of the importance of life-long learning through practical training.

PEO-4: Assume leading and influential roles in their organisations and societies.

Programme outcome:

After the successful completion of M.Sc. degree in Botany the students will be able to:

PO-1. Understand structure, function and life-cycle patterns of different plant life-forms.

PO-2. Achieve an up-to date level of understanding of plant physiology, ecology and biochemistry.

PO-3. Identify plant diseases, causing organisms and their control measures.

PO-4. Identify plants in their natural habitats, their economic and ethno-botanical importance.

- PO-5. Differentiate between different types of ecosystems and their structural components.
- PO-6. Evaluate services provided by different ecosystems in Himalayan region.
- PO-7. Understand and solve problems related to climate change and global warming.
- PO-8. Isolate and identify phytochemicals in different plant species and their antimicrobial potential.
- PO-9. Analyse regeneration status of different tree species in their natural habitat.
- PO-10. Develop strategies for conservation of rare and threatened plant species.
- PO-11. Develop protocol for propagation of economically and medicinally important plant species through plant tissue culture.

Programme Specific Outcome (PSOs):

After the successful completion of M.Sc. degree in Botany the students will be able to:

- PSO 1. Apply knowledge of botany in many applied fields like Agriculture, Horticulture, Sericulture, Forestry, Pharmacology and Medicine.
- PSO 2. Able to qualify competitive exams like UPSC, NET, SET, GATE, etc.
- PSO 3. Understand the multi-functionality of plants in production of secondary metabolites and their widespread industrial applications.
- PSO 4. Correlate biodiversity to habitat, climate change, land and forest degradation and develop conservation measures.

COURSE OUTCOME (COs):

At UG. level:

1. Students will be able to explain how organisms function at the level of the biomolecules, gene, genome, cell, tissue, and various plant-systems.
2. They will be able to explain various physiological and biochemical processes, development, reproduction and behavior of different forms of plant life.

At PG. level:

1. Students will be able to understand the range of plant diversity in terms of structure, function and conservation.
2. Students will strengthen the experimental techniques and methods of analysis appropriate for their area of specialization within botany.

Kumaun University

Master of Science (Computer Science)

Bachelor of Science (Computer Science)

Bachelor of Computer Application (Professional Course)



Curriculum Structure

*First Semester Examination December-2019, Second Semester Examination May/June-2020,
Third Semester Examination, December-2020 Fourth Semester Examination, May/June-2021*

Kumaun University
Sleepy Hollow,
Nainital PO 263001

Kumaun University is a place where a student not only comes to learn but also to grow. We have always been proud of our student-focused curriculum that helps students to gain knowledge in their respective fields and to become active and responsible citizens of our great Nation. We have formed our education ideology not only on the pursuit of knowledge but also on strong morals and ethics along with a keen focus on the environment which helps us in developing strong character within our students.

Computer Science is the study of computers and technology. Computers have been shaping the future of mankind with the great surge in technology like IoT in the last decade. The curriculum of our subject aims to provide any pupil in the course to understand the architecture, theory, and math behind the technologies that drive our modern world forward.

UG and PG in Computer Science facilitate the knowledge about the science behind computers and provide a platform to develop skills like programming, networking, cybersecurity, and database administration. It also focuses on the ethics of developing and working with new technologies by providing strong arguments for green computing, security, and user privacy protection.

Vision and Mission of the Department

VISION

To generate competent professionals to become part of the industry and research organizations at the global level with moral values committed to build a vibrant nation.

MISSION

- To strengthen the core competence in Computer Science through analytical learning.
- To provide a strong theoretical and practical background across the Computer Science discipline with an emphasis on application development.
- To inculcate professional behaviour, strong ethical values, innovative research capabilities and leadership qualities.
- To Empower the youth in rural and remote communities with computer education at the minimum cost.

Master of Science (Computer Science)

1. Programme Educational Objectives (PEOs)

The graduate will:

- PEO1: Continuously acquire and apply theoretical and applied knowledge related to the core areas of *Computer Science*.
- PEO2: Acquire a thorough knowledge of the conceptual, theoretical, and practical aspects of advanced-level core subject realms of *Computer Science*.
- PEO3: Work productively as a computer professional in traditional careers, graduate school, or academia.

2. Programme Outcomes (POs)

At the end of the M.Sc. Programme, graduates will be able to:

- PO1: Gain a full-fledged knowledge of the theories and practices of the core and advanced subject areas of *Computer science*.
- PO2: Get transformed into a skilled problem solver and researcher.
- PO3: Prepare for NET/SET/GATE examinations.
- PO4: Explore how the advanced concepts and applications of *Computer Science* lead to innovative and philosophical thought processing with a problem-rectifying attitude.

3. Programme Specific Outcomes (PSOs)

- PSO1: To demonstrate an understanding of the principles and mechanisms of the conceptual and software aspects of computer systems.
- PSO2: To become able to understand the design, architecture, and development methodologies of computational techniques and software systems.
- PSO3: To possess professional knowledge and skills of the software design process. Familiarity and practical competence with current programming languages, technologies, and open-source platforms.

- PSO4: To polish project development skills with insight into real-world problems, enhancement of researcher aptitude to solve them, and to work in a team cooperatively.

Master of Science (Computer Science)

First Semester

CS 101 Operating System

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand the basics of Operating Systems including Definitions, Generations of OS, Types of OS, and OS Architecture.
- Understand the core concepts and knowledge of advanced features of OS.
- Understand the various components of Process Management and Process Scheduling including Scheduling Algorithms
- Understand the process and applications of Inter-process Communication.
- Understand the reasons, detection, and recovery of Deadlocks in Operating Systems.
- Understand the basics of how Operating Systems manage Primary and Secondary Memories.
- Understand the reasons and solutions of Memory Fragmentation.
- Be proficient in Translating Virtual Address to Physical Address.
- Learn the complex, traditional and modern theories and practices of OS.

CS 102 Discrete Mathematics

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understanding the discrete structures and their role and implementation in Computer Science.
- Gain knowledge of the principles and practices of mathematical logic and its application.
- To be familiar with the advanced concepts of mathematical logic.
- Make a hands-on applications of mathematical tools and concepts related with digital systems and theoretical Computer Science.

CS 103 Theory of Computation

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Completely understand the automata theory and its applications to Computer Science.
- Understand the foundation of methods and tools for compiler designing.
- Gain knowledge of the core machines and their mathematical modeling.
- Become Familiar with the advanced concepts of the Automata theory.

CS 104 Advanced Database Systems

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Revisit the basic principles, theories, and practices of the Database management System (DBMS).
- Gain knowledge of the core and advanced design principles of DBMS.
- Understand of the transaction system, its methodologies, challenges, and practices.
- Learn the application of DBMS theory in designing modern age distributed systems.

Second Semester

CS 201 Compiler Design

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand the basic and sophisticated concepts of Compiler Design (CD).
- Gain knowledge of the core components of the CD process, their mechanisms, and roles.
- Understand the implementation issues and dynamic management of related problems.

CS 202 Design and Analysis of Algorithms

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Completely understand the classical algorithms of theoretical and applied Computer science.
- Learn the basic and advanced design and analysis procedures.
- Gain knowledge of advanced and sophisticated data structures, their mechanism, operations, and interconnection with algorithms.
- Understand the applications of the classical algorithms of Computer Science to real-world problems.
- Become Familiar with the classes of computing problems and their approximation.

CS 203 Advanced Computer Networks

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand the basic principles, theories, and concepts of the Computer Networks with a practical study of a live network.
- Gain knowledge of the advanced and contemporary protocols.
- Understand mobile computing technology.
- Become familiar with advanced security issues and technologies.

CS 204 Software Engineering

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Completely understand the software development processes, tools, and mythologies.
- Gain knowledge of different software development models, design processes, concepts, and methodologies.
- Understand the software project management.
- Knowledge of implementation, testing, and maintenance issues, theories, and practices.

Third Semester

CS 301 (A) .Net Framework and C#

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand the .NET framework, its theories, methodologies, and practices.
- Become familiar with C# language, its basic and advanced features.
- Learn OOP concepts with C#-specific implementation.
- Make a hands-on practice of windows, web, and distributed applications with C #.
- Study the Case study of the messenger application.

CS 301 (B) Network Security and Cryptography

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Completely understand the system and network security concepts, potential threats, and their solutions.
- Gain Knowledge of traditional and modern age encryption and related tools and techniques.
- Learn the advanced concepts of cryptography theory and practices.

CS 302 (A) Artificial Intelligence

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand the basics of Artificial Intelligence (AI) theory.
- Formulate of real-world problems in AI terminology and their possible solutions.
- Become familiar with the Natural Language Processing (NLP) theories and practices.
- Gain knowledge of the learning process and its models.
- Understand the AI applications in the design of expert systems.

CS 302 (B) Fuzzy Logic and Design

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understanding of the classical theory of Fuzzy logic, its basic operations, and tools.
- Knowledge of core and advanced concepts of Fuzzy logic.
- Understanding the applications of Fuzzy logic.

CS 303 Data mining and Warehousing

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Completely understand data warehousing and data mining with their concepts, models, architectures, theories, and practices.
- Learning of the applications of data mining tools in the business.
- Understanding of the advanced features of data mining and knowledge discovery.
- Learning applications of data mining tools in the domain of multimedia.

CS 304 Image Processing

Max. Marks: 100

(IA: 25 + ESA: 75)

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

- Understand of the concepts, methodologies, principles of digital image processing.
- Gain knowledge of the basic and advanced image processing operations and techniques.
- Become familiarity with the theory of feature detection and recognition.
- Make a hands-on applications of modern image compression tools.

Fourth Semester

CS 401 Project Work

Max. Marks: 500

(IA: 200 + ESA: 300)

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

- Become Familiar with real-world computing problems, latest technologies, and tools.
- Understand of the project development technicalities.
- Learn of design of modules, integration, testing, and debugging.
- Study applications of soft, research-oriented, and communication skills.

Bachelor of Science (Computer Science)

1. Programme Educational Objectives (PEOs)

The graduate will

- PEO1: Comprehend the world of *Computer Science* and its diverse fields.
- PEO2: Acquire a thorough knowledge of the conceptual, theoretical, and practical aspects of beginner and intermediate-level core subject realms of *Computer Science*.
- PEO3: Develop flair for the *Computer Science* and to acquire and polish programming and technical skills in traditional and modern programming languages and technologies.
- PEO4: Develop a lifelong learning temptation for adapting educational needs in a changing world to maintain competency and to contribute to the advancement of knowledge in a multidisciplinary environment.

2. Programme Outcomes (POs)

At the end of the B.Sc. Programme, graduates will be able to:

- PO1: Gain a complete exposure to the theories and practices of *Computer science*.
- PO2: Get transformed into a skilled learner and active programmer, enabling the students to focus on their higher studies.
- PO3: Value computer professionals and programmers.
- PO4: Explore how the concepts and applications of *Computer science* lead to innovative thinking with a problem-solving attitude.

3. Programme Specific Outcomes (PSOs)

- PSO1: To Gain knowledge of the fundamentals and intermediate-level concepts of *Computer Science* would have enhanced.
- PSO2: To understand the basics and intermediate-level soft skills.
- PSO3: To understand of the traditional and current technologies and practices in the world of Computers and digital platforms.
- PSO4: To view the real-world problems from the spectacles of conceptual knowledge of *Computer Science* and to develop their solutions in a technical oriented way.

Bachelor of Science (Computer Science)

First Semester

BCS 101 Computer Fundamentals

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand and appreciate the history and evolution of computers.
- Understand the classification of computers and various input/output devices.
- Understand various forms of data representation
- Understand different types of computer memories, memory hierarchy, and various types of storage devices.
- Understand software and need for different types of software.
- Understand the Basics of Unix and be proficient in Basic Unix commands.

BCS 102 Introduction to C and C++ Programming

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the history of C and C++ Programming languages.
- Understand various data types, operators, statements, keywords, and functions in the context of C/C++ programming.
- Understand Procedural as well as Object-Oriented Model of Programming.
- Proficient in setting up a programming environment for both C and C++.
- Proficient in solving simple as well as complex problems through programming in C and C++.
- Understand and Adapt the various programming conventions related to C and C++.

BCS L01 Lab: Practical (C, C++ Programming & Unix basics)

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Be proficient in writing programs in C and C ++.
- Be proficient in setting up the Unix environment.
- Be perform various tasks through Unix shell commands
- Be proficient in setting up a programming environment on Windows as well as Unix.

Second Semester

BCS 201 Data Structures

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand concepts such as Data Organizations, Need of Data Structures, Types of Data Structure, Algorithm Complexity, and Time-Space trade-off.
- Understand and apply data structures such as Stacks, Queues, Arrays, and Linked List.
- Understand the uses of Binary Tree and Binary Search Tree.

- Understand various Tree traversal algorithms as well as various Spanning Tree algorithms.
- Understand and be proficient in various searching and sorting algorithms.
- Understanding cases for using various algorithms and data structures over one another.

BCS 202 Digital Electronics

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand Digital Computer and Digital Systems
- Understand the logic and applications of Boolean algebra and logic gates.
- Understand the basics of Combinational and Sequential Logic Design.
- Understand the architecture of various Combinational and Sequential Circuits like Adders, Encoder-Decoder, Multiplexers-De-Multiplexers, and various types of Flip-Flops.
- Understand the architecture of Registers, Counters RAM, ROM.
- Be proficient in solving K-Maps, POS Simplification, NAND, and NOR Condition.

BCS L02 Lab: Practical (Data Structures)

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Be proficient in the Implementation of Various Data Structures in C/C++.
- Be proficient in Solving Various Computer Science Problems using Data Structures.
- Be proficient in the Implementation of Various Searching and Sorting algorithm in C/C++.
- Be proficient in applying the various algorithms to solve a given problem.
- Be proficient in Implementation of Trees, Binary Trees, Binary Search Trees, and various Tree Traversal Algorithm in C/C++.

Third Semester

BCS 301 Programming in Python

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the history of Python Language, the difference between Python 2.0/3.0, and a brief overview of the philosophy of Python language.
- Understand how to install, start, and use python Interpreter.
- Understand Python's basic data types, functions, and error handling.
- Understand how to divide a Python program into functions, how to design reliable and scalable functions, use of documentation strings, and anonymous functions.
- Understand the implementation of the Object-Oriented Program in Python Language.
- Understand the use of iterators and generators, how to create iterators and generators in python and when to use iterators over generators and vice versa.
- Learn how to test and debug Python Code.

BCS 302 Computers System Architecture

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the basics of computer organization and Design including Arithmetic and Logical micro-operations, shift micro-operations, computer registers, bus system, instruction set, design of basic computer, etc.
- Understand the function and architecture of the Central Processing Unit.
- Understand the basics of Input-Output Organization including Peripheral devices, I/O interfaces, Input-Output Processor, Modes of Transfer, Priority Interrupt, Direct Memory Access, Strobe Control, etc.
- Understand the basics of Memory Organization including Memory Hierarchy, Different types of Memory, and Memory Management Hardware.
- Understand the use and architecture of Pipelining and Parallel Processing.
- Understand Amdahl's law, Flynn's Classification, and Space-time diagram.

BCS L03 Lab: Practical (Python)

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Be proficient in installing and Setting up a Python programming environment.
- Be proficient in using the Python interpreter.
- Be proficient in writing and running scripts in Python Idle.
- Be proficient in writing Python programs to solve various problems.
- Be proficient in implementing OOP Model in Python.
- Be proficient in the implementation and use of Iterators and Generators in their Python program.

Fourth Semester

BCS 401 Introduction to Database Systems

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand various elements of DBMS and its architecture.
- Understand the history of the development of various DBMS Models, CODD's rule for referential Model.
- Understand and apply the Entity-relationship Model.
- Understand Normalization concepts, use of Normalization, and various Normal Forms including 1NF, 2NF, 3NF, and BCNF.
- Understand Various DBMS and RDBMS systems like Centralized systems, Client-Server Systems, and Parallel Systems.
- Be proficient in SQL fundamentals including creating and managing a Database.
- Understand the various measures of Backup, Recovery, Security, and Privacy of their Database Systems.

BCS 402 Operating Systems

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the basics of Operating Systems including Definitions, Generations of OS, Types of OS, and OS Architecture.
- Understand the various components of Process Management and Process Scheduling including Scheduling Algorithms
- Understand the process and applications of Inter-process Communication.
- Understand the reasons, detection, and recovery of Deadlocks in Operating Systems.
- Understand the basics of how Operating Systems manage Primary and Secondary Memories.
- Understand the reasons for and solutions of Memory Fragmentation.
- Be proficient in Translating Virtual Address to Physical Address.

BCS L04 Lab: Practical (DBMS)

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Be proficient in Installing and Setting up the Microsoft MySQL server.
- Be proficient in creating, managing, and deleting records, tables, and databases using SQL.
- Be proficient in designing databases aimed at solving organizational needs.
- Be proficient in securing databases for basic security threats.

Fifth Semester

BCS 501 Computer Networks

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand various components of a Computer Network.

- Understand Data Communication Fundamentals and Techniques including modulation, conversion, encoding, and multiplexing schemes.
- Understand the OSI/ISO Network Model and its components.
- Understand the role of each layer of the OSI/ISO Model.
- Understand the working and application of various Error Detection Techniques.
- Understand the Networks Switching Techniques and Access mechanisms.
- Understand various Routing algorithms.

BCS 502 Programming in JAVA

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the various components of the Java Runtime Environment.
- Understand and be proficient in Core Java features.
- Understand and Apply Network Programming in Java.
- Learn how to connect to a Database in Java and the benefits of database programming.
- Understand the basics of GUI programming and create various GUI applications in Java using AWT.
- Understand what threads are and how to use threads for a proficient Java Application.
- Understand how to apply multithreading in Java.

BCS L05 Lab: Practical (JAVA)

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Be proficient in installing and setting up the Java Development Kit.
- Be proficient in setting up multiple Java IDEs like Eclipse, IntelliJ Idea, and NetBeans.
- Be proficient in solving various problems in Java.
- Be proficient in programming network applications in Java-like Greet and Chat Servers and Clients.
- Be proficient in programming for databases in Java.

- Be proficient in creating a multithreaded application in Java.

Sixth Semester

BCS 601 Computer Graphics

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the basic elements of Computer Graphics.
- Learn Fundamental Techniques in Graphics like Line Drawing, Circle Drawing, and Filling.
- Learn and Apply Two-Dimensional Geometric Transformation.
- Understand the Two-Dimensional Viewing pipeline.
- Learn and Apply Various Clipping Operations.
- Understand some Three-Dimensional Concepts of Computer Graphics.
- Be proficient in implementing the studied graphics techniques in C/C++ or Java.

BCS 602 Information Security

Max Marks: 80

(IA: 20 + ESA: 60)

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

- Understand the basics of Computer Security, Threats, and Attacks.
- Learn Cryptography and various Cryptography algorithms.
- Understand and Apply Various Program Security concepts and measures.
- Understand the Two-Dimensional Viewing pipeline.
- Learn about various Threats in an OS and how to protect against those Threats.
- Understand various Network Security Components.

BCS L06 Project Work

Max Marks: 60

(IA: 15 + ESA: 45)

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

- Become familiar with real-world computing problems, latest technologies, and tools.
- Understand the project development technicalities.
- Learn the design of modules, integration, testing, and debugging.
- Apply soft, research-oriented, and communication skills.

Bachelor of Computer Application (Professional Course)

1. Programme Educational Objectives (PEOs)

The professional course graduates will be

- PEO1: Equipped to get employment in IT industries by being provided with required domain knowledge.
- PEO2: Provided with the practical training, hands-on and project experience to meet the industrial needs.
- PEO3: Motivated to develop entrepreneurial skills to provide solutions and to develop software products as per the enterprise needs.
- PEO4: Trained to deploy creativity, to develop innovative ideas and to work in teams for accomplishing a common goal.
- PEO5: Addressed with contemporary social issues and will be guided to deal with problems with a result-oriented attitude.

2. Programme Outcomes (POs)

At the end of the BCA Programme, graduates will be able to:

- PO1: Excel in the IT industry and to design and develop reliable software solutions for commercial and social needs.
- PO2: Understand and identify the actual customer requirements, create high-level designs, and to implement robust software applications using the latest technologies and tools.
- PO3: Work professionally with social, cultural, and ethical responsibilities as an individual as well as in multifaceted teams with a positive attitude.

- PO4: Be capable of adapting to new technologies and constantly upgrade their skills with an attitude towards independent and lifelong learning process.

3. Programme Specific Outcomes (PSOs)

- PSO1: Attainment of the professional skills to provide innovative solutions, to design and develop computer applications, and to present oneself emphatically in the industry.
- PSO2: Explore technical knowledge in diverse areas of *Computer Applications* and experience of a professional environment to nurture the required skills needed for a successful career and higher studies.
- PSO3: Developing skills, strength, determination, and confidence for entrepreneurship.

Bachelor of Computer Application (Professional Course)

First Semester

BCA 111 Communicative English

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the effective methods of oral and written communication.
- Be capable to represent own ideas and views both in speech and writing
- Gain in confidence to present oneself in the interview, group discussion, and extempore.
- Gain knowledge of various components of English grammar.
- Learn the design of different business letters and other professional communication tools.

BCA 112 Basic Mathematics

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the mathematical theories and practices required in the analysis of algorithms.
- Visualize computer graphics and other related realms of Computer Science and Applications.
- Be proficient construction of logical arguments and rigorous proofs.
- Formulate and solve abstract mathematical problems.

BCA 113 Computer Fundamentals

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand and appreciate the history and evolution of computers.
- Understand the classification of computers and various input/output devices.
- Understand various forms of data representation
- Understand different types of computer memories, memory hierarchy, and various types of storage devices.
- Understand software and need for different types of software.
- Understand the Basics of Unix and be proficient in Basic Unix commands.

BCA 114 Introduction to C Language

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the programming languages and allied technologies.
- Make a hands-on implementation of basic programming tools.

- Understand the advanced and modern-age programming languages.
- Understand the history of C Programming languages.
- Understand various data types, operators, statements, keywords, and functions in the context of C programming.
- Be proficient in setting up a programming environment for C.
- Be proficient in solving simple as well as complex problems through programming in C.

Second Semester

BCA 211 Discrete Mathematics

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the discrete structures and their role and implementation in Computer Science and Applications.
- Gain knowledge of the principles and practices of mathematical logic and its application.
- Be familiar with the mathematical tools and concepts related to digital systems and theoretical Computer Science.

BCA 212 Introduction to C++

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the Object-Oriented Programming (OOP) paradigm and the C++ language.
- Revisit the primitive and advanced programming tools with the C++ language.
- Gain knowledge of OOP concepts, methodologies, and implementations with the C++ language.
- Be familiar with advanced features of the C++ language.

BCA 213 Data Structure

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand concepts such as Data Organizations, Need of Data Structures, Types of Data Structure, Algorithm Complexity, and Time-Space trade-off.
- Understand and apply data structures such as Stacks, Queues, Arrays, and Linked List.
- Understand the uses of Binary Tree and Binary Search Tree.
- Understand various Tree traversal algorithms as well as various Spanning Tree algorithms.
- Understand and be proficient in various searching and sorting algorithms.
- Understanding cases for using various algorithms and data structures over one another.

BCA 214 Digital Electronics

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand Digital Computer and Digital Systems
- Understand the logic and applications of Boolean algebra and logic gates.
- Understand the basics of Combinational and Sequential Logic Design.
- Understand the architecture of various Combinational and Sequential Circuits like Adders, Encoder-Decoder, Multiplexers-De-Multiplexers, and various types of Flip-Flops.
- Understand the architecture of Registers, Counters RAM, ROM.
- Proficient in solving K-Maps, POS Simplification, NAND, and NOR Condition.

Third Semester

BCA 301 Organization Behavior

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the concepts and theories of Organizational Behaviour.
- Gain knowledge of motivation theories and practices.
- Understand the concepts of personality and stress management.
- Learn of the attitude of teamwork and leadership qualities.

BCA 302 Optimization Techniques

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the theories, concepts, and applications of Operations Research (OR).
- Learn of mathematical formulation of computational problems and their solutions.
- Gain knowledge of various mathematical models and their applications in classical problems of Computer Science.

BCA 303 Computer Graphics

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the basic elements of Computer Graphics.
- Learn Fundamental Techniques in Graphics like Line Drawing, Circle Drawing, and Filling.
- Learn and Apply Two-Dimensional Geometric Transformation.
- Understand the Two-Dimensional Viewing pipeline.
- Learn and Apply Various Clipping Operations.

- Understand some Three-Dimensional Concepts of Computer Graphics.
- Be proficient in implementing the learned Graphics techniques in C/C++ or Java.

BCA 304 Computer System Architecture

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the basics of computer organization and Design including Arithmetic and Logical micro-operations, shift micro-operations, computer registers, bus system, instruction set, design of basic computer, etc.
- Understand the function and architecture of the Central Processing Unit.
- Understand the basics of Input-Output Organization including Peripheral devices, I/O interfaces, Input-Output Processor, Modes of Transfer, Priority Interrupt, Direct Memory Access, Strobe Control, etc.
- Understand the basics of Memory Organization including Memory Hierarchy, Different types of Memory, and Memory Management Hardware.
- Understand the use and architecture of Pipelining and Parallel Processing.
- Understand Amdahl's law, Flynn's Classification, and Space-time diagram.

BCA 305 Object-Oriented Programming Using C++

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand Object-Oriented Programming (OOP) paradigm and the C++ language.
- Revisit of primitive and advanced programming tools with the C++ language.
- Gain knowledge of OOP concepts, methodologies, and implementations with the C++ language.
- Be familiar with file handling concepts and tools.

Fourth Semester

BCA 401 Computer Networks

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand various components of a Computer Network.
- Understand Data Communication Fundamentals and Techniques including modulation, conversion, encoding, and multiplexing schemes.
- Understand the OSI/ISO Network Model and its components.
- Understand the role of each layer of the OSI/ISO Model.
- Understand the working and application of various Error Detection Techniques.
- Understand the Networks Switching Techniques and Access mechanisms.
- Understand various Routing algorithms.

BCA 402 Numerical and Statistical Techniques

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand various statistical tools for data collection, processing, and analysis.
- Learn foundations for machine learning technology.
- Learn various mathematical tools for computing and business problems.

BCA 403 Unix and Shell Programming

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Completely understand network operating systems with UNIX and LINUX.
- Gain knowledge of primitive and advanced concepts of the UNIX operating system.
- Make a Hands-on practice of tools of Shell programming.
- Be familiar with an advanced editor and scripting language.

BCA 404 Environmental Science

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the ecosystem, resources, environment, etc., and human dependence on them.
- Be awareness about the moral duties of mankind towards nature.
- Gain knowledge of the environmental, social, and ethical issues.
- Make a hands-on experience of natural assets and their study.

BCA 405 Java Programming

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the various components of the Java Runtime Environment.
- Understand and be proficient in Core Java features.
- Understand and Apply Network Programming in Java.
- Learn how to connect to a Database in Java and the benefits of database programming.
- Understand the basics of GUI programming and create various GUI applications in Java using AWT.
- Understand what threads are and how to use threads for a proficient Java Application.
- Understand how to apply multithreading in Java.

Fifth Semester

BCA 501 Software Engineering

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Completely understand the software development processes, tools, and mythologies.
- Gain Knowledge of different software development models and their implementations and cost estimation.
- Understand of the software design process, concepts, and methodologies.
- Be Familiar with modern and programming language features and their impact on the software development process.

BCA 502 Artificial Intelligence

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the basics of Artificial Intelligence (AI) theory.
- Formulate of real-world problems in AI terminology and their possible solutions.
- Gain knowledge of the learning process and its models.
- Be familiarity with applications of AI with Natural Language Processing (NLP).

BCA 503 (A) Programming in Python

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand the history of Python Language, the difference between Python 2.0/3.0, and a brief overview of the philosophy of Python language.
- Understand how to install, start, and use python Interpreter.
- Understand Python's basic data types, functions, and error handling.
- Understand how to divide a Python program into functions, how to design reliable and scalable functions, use of documentation strings, and anonymous functions.
- Understand the implementation of the Object-Oriented Program in Python Language.
- Understand the use of iterators and generators, how to create iterators and generators in python and when to use iterators over generators and vice versa.
- Learn how to test and debug Python Code.

BCA 503(B) .Net Framework and C#

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Understand of the .NET framework, its theories, methodologies, and practices.
- Be familiar with C# language, its basic and advanced features.
- Revisit of OOP concepts with C#-specific implementation.
- Make a hands-on practice of windows and web applications with C #.

BCA 504 Theory of Computation

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Completely understand the Automata theory and its applications to Computer Science.
- Understand foundation of methods and tools for compiler designing.
- Gain knowledge of the core machines and their mathematical modeling.
- Be Familiar with classical complexity theory of Computer Science.

BCA 505 Web Technology

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Completely understand the contemporary theories and practices of web development and maintenance.
- Gain knowledge of web development tools, their basic and advanced features.
- Make a hands-on applications of HTML and Java Scripts.

Sixth Semester

BCA 601 Project Work

Max. Marks: 100

(IA: 30 + ESA: 70)

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

- Be Familiar with real-world computing problems, latest technologies, and tools.
- Understand the process of real-world project development technicalities.
- Gain experience of working in a team with solo responsibilities.
- Apply soft, research-oriented, and communication skills.
- Learn of design of modules, integration, testing, and debugging.

कुमाऊँ विश्वविद्यालय

नैनीताल(उत्तराखण्ड)



हिन्दी एवं अन्य भारतीय भाषा विभाग

Programmes

1. स्नातक (बी.ए.)
2. परास्नातक (एम.ए.)
3. शोध (पी-एच.डी.)

स्नातक (बी.ए.)

Programme Educational Objectives

कुमाऊँ विश्वविद्यालय द्वारा कला संकाय में स्नातक स्तर पर बैचलर ऑफ आर्ट्स – बी.ए. की उपाधि प्रदान की जाती है। इसके अन्तर्गत विभिन्न विषयों का समावेश किया गया है, जिनमें हिन्दी भाषा एवं हिन्दी साहित्य प्रमुख विषय हैं। बी.ए. की यह उपाधि उच्चशिक्षा में शिक्षार्थी की प्रथम उपाधि है।

- PEO 1.** सम्मानजनक आजीविका प्राप्ति हेतु शिक्षार्थी को मानविकी के अन्य किन्हीं दो विषयों के साथ हिन्दी भाषा एवं हिन्दी साहित्य का ज्ञान उपलब्ध कराते हुए स्नातक की उपाधि के लिए प्रस्तुत करना।
- PEO 2.** परास्नातक शिक्षा, उच्चस्तरीय शोध एवं विभिन्न प्रतियोगी परीक्षाओं हेतु शिक्षार्थी को शैक्षिक आधारभूमि प्रदान करना।
- PEO 3.** शिक्षार्थी को आलोचनात्मक, रचनात्मक, उदार, नवोन्मेषी एवं तार्किक चिंतन के लिए प्रेरित करना।
- PEO 4.** समाज व राष्ट्र की सेवा के लिए उच्च जीवन एवं नैतिक मूल्यों के धारक स्नातक तैयार करना।

हिन्दी भाषा

Programme Outcome

- PO 1.** शिक्षार्थी आधार पाठ्यक्रम के रूप में हिन्दी भाषा के अध्ययन से हिन्दी भाषा के व्यावहारिक पक्ष में विशेषज्ञता प्राप्त करता है।
- PO 2.** शिक्षार्थी आधार पाठ्यक्रम के रूप में हिन्दी भाषा के अध्ययन से हिन्दी भाषा के संवैधानिक यथा राजभाषा व राष्ट्रभाषा सम्बन्धी पक्ष में विशेषज्ञता प्राप्त करता है।
- PO 3.** शिक्षार्थी आधार पाठ्यक्रम के रूप में हिन्दी भाषा के अध्ययन से हिन्दी के सम्पर्क भाषा सम्बन्धी पक्ष में विशेषज्ञता प्राप्त करता है।
- PO 4.** शिक्षार्थी आधार पाठ्यक्रम के रूप में हिन्दी भाषा के अध्ययन से हिन्दी के कार्यालयी व्यवहार एवं उपयोग में विशेषज्ञता प्राप्त करता है।
- PO 5.** शिक्षार्थी संघ लोक सेवा आयोग एवं प्रादेशिक लोक सेवा आयोगों के परीक्षा पाठ्यक्रम में सम्मिलित हिन्दी भाषा की आधार व अनिवार्य शिक्षा प्राप्त करता है।

प्रथम प्रश्नपत्र

(बी.ए. प्रथम सत्र : अध्ययन अवधि 6 माह)

Course Outcome

- CO 1. शिक्षार्थी हिन्दी भाषा के व्यावहारिक प्रयोजनार्थ वर्तनी एवं शब्दों के मानक स्वरूप का ज्ञान व प्रशिक्षण पाता है।
- CO 2. शिक्षार्थी व्यावहारिक प्रयोजनार्थ शुद्ध लेखन हेतु हिन्दी की वाक्य-संरचना एवं व्याकरण का ज्ञान व प्रशिक्षण पाता है।
- CO 3. शिक्षार्थी को व्यावहारिक-व्यावसायिक प्रयोजनार्थ हिन्दी भाषा की अत्यन्त समृद्ध शब्द सम्पदा तथा उसकी समाहार-समायोजन शक्ति का ज्ञान होता है।
- CO 4. शिक्षार्थी कार्यालयी प्रयोजनार्थ पारिभाषिक – प्रतिपारिभाषिक शब्दों के प्रयोग का ज्ञान व प्रशिक्षण पाता है।

निर्धारित पाठ्यक्रम

- 1.वर्णविचार : - हिंदी वर्णमाला: स्वर और व्यंजन, वर्णों का उच्चारण और वर्गीकरण
- 2.हिंदी-वर्तनी: हिंदी वर्तनी का मानकीकरण, शब्द और वर्तनी-विश्लेषण, वर्तनी विषयक अशुद्धियाँ और उनका शोधन।
- 3.शब्द विचार :- व्याकरण के आधार पर शब्दों का वर्गीकरण(विकारी और अविकारी शब्द)
- 4.हिंदी शब्द रचना- समास, संधि, उपसर्ग, प्रत्यय, शब्द की परिभाषा, रचना के आधार पर शब्दभेद- रूढ़, यौगिक, योगरूढ़; इतिहास के आधार पर- तत्सम्, तद्भव, देशी, देशज, विदेशी और संकर शब्द। अर्थ के आधार पर पर्यायवाची, विलोम और अनेकार्थी शब्द, वाक्यांश के लिए एक शब्द।
- 5.पारिभाषिक शब्द: तात्पर्य, परिभाषा तथा संलग्न परिशिष्ट के अंतर्गत संगृहीत- 250 अंग्रेजी पारिभाषिक शब्दों के हिंदी प्रतिपारिभाषिक शब्द, हिंदी पारिभाषिक शब्दों के अंग्रेजी प्रतिपारिभाषिक।

अथवा

अंग्रेजी से हिंदी अनुवाद

- 6.लोकोक्ति एवं मुहावरे
- 7.विराम चिह्न और उनका प्रयोग।
- 8.वाक्य रचना, वाक्य-भेद, वाक्य-विश्लेषण, वाक्य-संश्लेषण, वाक्य-शुद्धि।

II

द्वितीय प्रश्नपत्र

(बी.ए. द्वितीय सत्र : अध्ययन अवधि 6 माह)

Course Outcome

- CO 1. शिक्षार्थी को हिन्दी भाषा के विस्तृत व समृद्ध इतिहास व विकास का ज्ञान होता है।
- CO 2. शिक्षार्थी को हिन्दी की शैलियों यथा हिन्दी, हिन्दुस्तानी व उर्दू का ज्ञान होता है, जो भाषा के व्यावहारिक प्रयोग में काम आता है।
- CO 3. शिक्षार्थी को हिन्दी की बोलियों का ज्ञान होता है, जिसके आधार पर वह अपने भाषा संस्कारों को समृद्ध करता है तथा सम्पर्क भाषा के रूप में हिन्दी का प्रयोग अधिक कुशलता के साथ कर पाता है।
- CO 4. शिक्षार्थी को राजभाषा के रूप में हिन्दी की संवैधानिक स्थिति का ज्ञान होता है, जिसकी आवश्यकता उसे सरकारी सेवाओं में आवश्यकीय रूप से होती है।
- CO 5. शिक्षार्थी विभिन्न व्यावहारिक व व्यावसायिक प्रयोजनों हेतु हिन्दी के मानकीकृत रूप का ज्ञान व प्रशिक्षण पाता है।
- CO 6. शिक्षार्थी कम्प्यूटर व इंटरनेट की तकनीक में हिन्दी के प्रयोग का आरंभिक ज्ञान व प्रशिक्षण पाता है।

निर्धारित पाठ्यक्रम

1. हिंदी भाषा का उद्भव और विकास।
2. हिंदी की शैलियाँ- हिंदी, हिंदुस्तानी, उर्दू।
3. हिंदी की उपभाषाएँ एवं बोलियाँ- (1) पश्चिमी हिंदी (2) पूर्वी हिंदी (3) राजस्थानी (4) बिहारी (5) पहाड़ी एवं उनकी बोलियाँ।
4. हिंदी भाषा: राजभाषा, राष्ट्रभाषा, मानक भाषा, सम्पर्क भाषा, इंटरनेट और हिंदी
5. देवनागरी लिपि एवं अंक
6. संक्षेपण/पल्लवन
7. प्रारूपण
8. निबंध लेखन

हिन्दी साहित्य

Programme Outcome

- PO 1. साहित्य मानव संवेदना की अभिव्यक्ति का प्रमुख स्रोत रहा है। कलाओं में यह सम्पूर्ण कला है। साहित्य समाज का प्रतिदर्श है। स्नातक उपाधि में इस विषय के चयन व अध्ययन से शिक्षार्थी को साहित्य के सांगोपांग महत्व का ज्ञान होता है।
- PO 2. शिक्षार्थी को राष्ट्र की सर्वप्रमुख भाषा हिन्दी के अत्यन्त समृद्ध साहित्य के सम्पूर्ण स्वरूप का ज्ञान होता है।
- PO 3. शिक्षार्थी को हिन्दी साहित्य की सभी प्रमुख विधाओं का ज्ञान होता है, जिससे उसमें रचनात्मकता का प्रस्फुटन एवं विकास होता है।
- PO 4. शिक्षार्थी को जीवन के आजीविकोपार्जन सम्बन्धी पक्ष के रूप में हिन्दी के प्रयोजनमूलक स्वरूप व महत्व का ज्ञान एवं प्रशिक्षण होता है।
- PO 5. साहित्य के अध्ययन में अन्य अनुशासनों के सन्दर्भ यथा सामाजिक, मनोवैज्ञानिक, राजनीतिक, आर्थिक, ऐतिहासिक, पर्यावरणीय आदि समाहित होते हैं। स्नातक में हिन्दी साहित्य का चयन शिक्षार्थी को समग्र रूप से शिक्षित करता है।
- PO 6. शिक्षार्थी संघ लोक सेवा आयोग एवं प्रादेशिक लोक सेवा आयोगों के परीक्षा पाठ्यक्रम में सम्मिलित हिन्दी साहित्य की आधार व अनिवार्य शिक्षा प्राप्त करता है।

I

प्रथम प्रश्नपत्र - प्राचीन एवं भक्तिकालीन काव्य (प्रथम सत्र)

- CO 1. शिक्षार्थी हिन्दी साहित्य के आरम्भिक काल की कविता का ऐतिहासिक एवं सैद्धान्तिक ज्ञान सोदाहरण प्राप्त करता है।
- CO 2. शिक्षार्थी चंदबरदाई, जायसी व तुलसी के कृतित्व को समझने के क्रम में महाकाव्य विधा का शिल्पगत परिचय व ज्ञान प्राप्त करता है।
- CO 3. शिक्षार्थी आदिकालीन वीरकाव्य का सैद्धान्तिक परिचय व ज्ञान सोदाहरण प्राप्त करता है।
- CO 4. शिक्षार्थी निर्गुण काव्यधारा व संत साहित्य का सैद्धान्तिक परिचय व ज्ञान सोदाहरण प्राप्त करता है।
- CO 5. शिक्षार्थी सूफी काव्यधारा, सगुण काव्यधारा तथा उसके अंतर्गत रामभक्ति तथा कृष्णभक्ति शाखा के महत्वपूर्ण काव्य का सैद्धान्तिक परिचय व ज्ञान सोदाहरण प्राप्त करता है।

है।

निर्धारित पाठ्यक्रम

प्राचीन एवं भक्तिकालीन काव्य : सम्मिलित कवि – चंदबरदाई, कबीर, जायसी, सूरदास एवं तुलसीदास
(पाठ्यपुस्तक प्रो. मानवेन्द्र पाठक द्वारा सम्पादित)

II

द्वितीय प्रश्नपत्र - हिन्दी कथा साहित्य (प्रथम सत्र)

- CO 1. शिक्षार्थी हिन्दी की कथा परम्परा का परिचय व ज्ञान प्राप्त करता है।
- CO 2. शिक्षार्थी हिन्दी उपन्यास के उद्भव और विकास का ज्ञान प्राप्त करता है।
- CO 3. शिक्षार्थी हिन्दी कहानी के उद्भव और विकास का ज्ञान प्राप्त करता है।
- CO 4. शिक्षार्थी पाठ्यक्रम में सम्मिलित उपन्यास के अध्ययन से उपन्यास विधा का शिल्पगत ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी पाठ्यक्रम में सम्मिलित कहानियों के आधार पर कहानी विधा का शिल्पगत ज्ञान प्राप्त करता है।
- CO 6. शिक्षार्थी कथा-साहित्य की समीक्षा का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

हिन्दी कथा साहित्य : 1. त्यागपत्र(उपन्यास) – जैनेन्द्र कुमार
2. कहानी सप्तक – सं प्रो. नीरजा टंडन

III

तृतीय प्रश्नपत्र - रीतिकालीन काव्य एवं काव्यांग परिचय (द्वितीय सत्र)

- CO 1. शिक्षार्थी हिन्दी साहित्य के तीसरे काल रीतिकाल के विषय में ऐतिहासिक एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO 2. शिक्षार्थी पाठ्यक्रम में सम्मिलित कविताओं के आधार पर रीतिकालीन कविता की कला और शिल्प का ज्ञान प्राप्त करता है।
- CO 3. शिक्षार्थी काव्यांग के अन्तर्गत रस के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है।
- CO 4. शिक्षार्थी काव्यांग के अन्तर्गत छंद के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है।

- CO 5. शिक्षार्थी काव्यांग के अन्तर्गत अलंकार के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है।
CO 6. शिक्षार्थी काव्यांग के अन्तर्गत शब्दशक्ति के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

- रीतिकालीन काव्य एवं काव्यांग परिचय : 1. सम्मिलित कवि – केशव, बिहारी, देव, घनानंद एवं भूषण
2. काव्यांग परिचय – रस, छंद, अलंकार एवं शब्दशक्तियाँ

IV

चतुर्थ प्रश्नपत्र - नाटक एवं एकांकी (द्वितीय सत्र)

- CO 1. शिक्षार्थी हिन्दी में नाटक विधा के उद्भव और विकास का ज्ञान प्राप्त करता है।
CO 2. शिक्षार्थी नाटक की भारतीय एवं पाश्चात्य परम्पराओं का ज्ञान प्राप्त करता है।
CO 3. शिक्षार्थी नाटक के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है।
CO 4. शिक्षार्थी पाठ्यक्रम में सम्मिलित नाटक के अध्ययन के आधार पर नाट्यसमीक्षा का ज्ञान प्राप्त करता है।
CO 5. शिक्षार्थी एकांकी के उद्भव -विकास का ज्ञान प्राप्त करता है।
CO 6. शिक्षार्थी एकांकी के स्वरूप, महत्व एवं प्रकारों का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

- नाटक एवं एकांकी : 1. ध्रुवस्वामिनी (नाटक) – जयशंकर प्रसाद
2. चार एकांकी – सं. प्रो. डी.एस.पोखरिया

V

पंचम प्रश्नपत्र - द्विवेदीयुगीन एवं छायावादी काव्य (तृतीय सत्र)

- CO 1. शिक्षार्थी हिन्दी के द्विवेदी युग व नवजागरण काल के विषय में ऐतिहासिक व सैद्धान्तिक ज्ञान प्राप्त करता है।
CO 2. शिक्षार्थी हिन्दी कविता के छायावाद युग का ऐतिहासिक व सैद्धान्तिक ज्ञान प्राप्त करता है।
CO 3. शिक्षार्थी खड़ी बोली हिन्दी की आरम्भिक समर्थ काव्य-परम्परा का ज्ञान प्राप्त करता है।
CO 4. शिक्षार्थी पाठ्यक्रम में सम्मिलित द्विवेदीयुगीन कविताओं के अध्ययन से तत्कालीन हिन्दी

- कविता के स्वरूप, महत्व तथा शिल्प का ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी पाठ्यक्रम में सम्मिलित छायावादयुगीन कविताओं के अध्ययन से तत्कालीन हिन्दी कविता के स्वरूप, महत्व तथा शिल्प का ज्ञान प्राप्त करता है।
- CO 6. शिक्षार्थी आधुनिक कविता की समीक्षा का ज्ञान एवं प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम

द्विवेदीयुगीन एवं छायावादी काव्य : हरिऔध, मैथिलीशरण गुप्त, जयशंकर प्रसाद, सुमित्रानंदन पंत, सूर्यकांत त्रिपाठी निराला एवं महादेवी वर्मा
(पाठ्यपुस्तक प्रो. चंद्रकला रावत द्वारा सम्पादित)

VI

षष्ठ प्रश्नपत्र - हिन्दी के प्रतिनिधि निबंध (तृतीय सत्र)

- CO 1. शिक्षार्थी निबंध विधा के स्वरूप का ज्ञान प्राप्त करता है।
- CO 2. शिक्षार्थी हिन्दी में निबंध विधा के उद्भव और विकास का ज्ञान प्राप्त करता है।
- CO 3. शिक्षार्थी सामाजिक व साहित्यिक विषयों से निबंध के वैचारिक सम्बन्ध तथा अभिव्यक्ति का ज्ञान प्राप्त करता है।
- CO 4. शिक्षार्थी निबंध के प्रकारों का ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी पाठ्यक्रम में सम्मिलित निबंधकारों के अध्ययन से विचार के क्षेत्र में मौलिक अभिव्यक्ति का ज्ञान एवं प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम

हिन्दी के प्रतिनिधि निबंध : सम्मिलित निबंधकार – चंद्रधर शर्मा गुलेरी, बालकृष्ण भट्ट, रामचंद्र शुक्ल, हजारी प्रसाद द्विवेदी, महादेवी वर्मा, हरिशंकर परसाई, विद्यानिवास मिश्र, रामधारी सिंह दिनकर, निर्मल वर्मा एवं कुबेरनाथ राय
(पाठ्यपुस्तक प्रो. नीरजा टंडन द्वारा सम्पादित)

VII

सप्तम प्रश्नपत्र - छायावादोत्तरी हिन्दी कविता (चतुर्थ सत्र)

- CO 1. शिक्षार्थी छायावादोत्तरी कविता का ऐतिहासिक एवं सैद्धान्तिक ज्ञान प्राप्त करता है।

- CO 2. शिक्षार्थी आधुनिक हिन्दी कविता में राष्ट्रीय एवं सांस्कृतिक चेतना से सम्पृक्त काव्य का परिचय प्राप्त करता है।
- CO 3. शिक्षार्थी आधुनिक हिन्दी कविता में गीतकाव्य का परिचय प्राप्त करता है।
- CO 4. शिक्षार्थी आधुनिक हिन्दी कविता में प्रगतिवाद का रचनात्मक व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी आधुनिक हिन्दी कविता में प्रयोगवाद का रचनात्मक व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO 6. शिक्षार्थी आधुनिक हिन्दी कविता में नयी कविता का रचनात्मक व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO 7. शिक्षार्थी आधुनिक हिन्दी कविता में साठोत्तरी कविता का रचनात्मक व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO 8. शिक्षार्थी छायावादोत्तरी कविता के विविधरूपी शिल्प का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

छायावादोत्तर हिन्दी कविता : सम्मिलित कवि – अज्ञेय, मुक्तिबोध, नागार्जुन, शमशेर बहादुर सिंह, भवानी प्रसाद मिश्र, कुंवर नारायण, सर्वेश्वरदयाल सक्सेना एवं केदारनाथ सिंह
(पाठ्यपुस्तक प्रो. शिरीष कुमार मौर्य द्वारा सम्पादित)

VIII

अष्टम प्रश्नपत्र - स्मारक साहित्य(चतुर्थ सत्र)

- CO 1. शिक्षार्थी को हिन्दी में स्मारक साहित्य लेखन परम्परा का ज्ञान होता है।
- CO 2. शिक्षार्थी को स्मारक साहित्य के स्वरूप व उसकी विधाओं का ज्ञान प्राप्त होता है।
- CO 3. शिक्षार्थी को पाठ्यक्रम में सम्मिलित रेखाचित्रों के अध्ययन से रेखाचित्र विधा के स्वरूप, तत्वों और विशेषताओं का ज्ञान प्राप्त होता है
- CO 4. शिक्षार्थी को पाठ्यक्रम में सम्मिलित संस्मरणों के अध्ययन से संस्मरण विधा के स्वरूप, तत्वों और विशेषताओं का ज्ञान प्राप्त होता है।
- CO 5. शिक्षार्थी को महान साहित्यकारों के जीवन से जुड़ी घटनाओं को पढ़ने से उच्च जीवन मूल्यों की शिक्षा व प्रेरणा प्राप्त होती है।

निर्धारित पाठ्यक्रम

स्मरण वीथिका: शिवपूजन सहाय, सेठ गोविंददास, बनारसीदास चतुर्वेदी, आचार्य हजारीप्रसाद द्विवेदी एवं विष्णुकांत शास्त्री के रेखाचित्र।
माखनलाल चतुर्वेदी, अज्ञेय, डॉ. नगेन्द्र एवं महादेवी वर्मा कृत संस्मरण
(पाठ्यपुस्तक 'स्मरण वीथिका' प्रो. निर्मला ढैला बोरा द्वारा सम्पादित)

IX

नवम प्रश्नपत्र - प्रयोजनमूलक हिन्दी (पंचम सत्र)

- CO 1. शिक्षार्थी हिन्दी भाषा का प्रयोजनमूलक ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO 2. शिक्षार्थी सामान्य कार्यालयी प्रयोजनों यथा कार्यालयी पत्राचार, प्रारूपण, टिप्पण आदि में हिन्दी के प्रयोग का ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO 3. शिक्षार्थी हिन्दी भाषा की कम्प्यूटिंग यथा टाइपिंग, फांट प्रबन्धन, वर्ड प्रोसेसिंग, डाटा प्रोसेसिंग का ज्ञान प्राप्त करता है।
- CO 4. शिक्षार्थी मीडिया यथा प्रेस, रेडियो, टी.वी. वीडियो, इंटरनेट आदि के क्षेत्र में लेखन-सम्पादन सम्बन्धी ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी जनसंचार माध्यमों का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

- प्रयोजनमूलक हिन्दी : 1. पत्राचार (कार्यालयी पत्र, प्रारूपण, टिप्पणी, व्यावसायिक पत्र)
2. संक्षेपण एवं पल्लवन
 3. भाषा कम्प्यूटिंग, वर्ड प्रोसेसिंग, डाटा प्रोसेसिंग और फांट प्रबंधन
 4. सम्पादन कला, प्रिंट मीडिया, इलेक्ट्रॉनिक मीडिया, फीचर लेखन, पृष्ठसज्जा और प्रस्तुतीकरण
 5. मीडिया लेखन, संचार भाषा का स्वरूपस्वरूप और वर्तमान संचार व्यवस्था
 6. प्रमुख जनसंचार माध्यम, प्रेस, रेडियो, टीवी, फिल्म, वीडियो और इंटरनेट।
माध्यमोपयोगी लेखन प्रविधि।

X

दशम प्रश्नपत्र - लोक साहित्य (पंचम सत्र)

- CO 1. शिक्षार्थी साहित्य के लोकपक्ष का ऐतिहासिक तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO 2. शिक्षार्थी लोक साहित्य के स्वरूप, अध्ययन की प्रविधियों, संकलन प्रक्रिया आदि का प्रशिक्षण एवं ज्ञान प्राप्त करता है।
- CO 3. शिक्षार्थी लोक संस्कृति का ज्ञान प्राप्त करता है।

- CO 4. शिक्षार्थी लोक साहित्य के अन्तर्गत लोकगीतों के स्वरूप, उनके सामाजिक-सांस्कृतिक स्रोतों तथा विविध रूपों का ज्ञान प्राप्त करता है।
- CO 5. शिक्षार्थी लोक साहित्य के अन्तर्गत लोक नाट्य के स्वरूप, उसके सामाजिक-सांस्कृतिक स्रोतों तथा विविध रूपों का ज्ञान प्राप्त करता है।
- CO 6. शिक्षार्थी लोक साहित्य के अन्तर्गत लोककथाओं के स्वरूप, उनके सामाजिक-सांस्कृतिक स्रोतों तथा विविध रूपों का ज्ञान प्राप्त करता है।
- CO 7. शिक्षार्थी लोक साहित्य के अन्तर्गत लोकगाथाओं के स्वरूप, उनके सामाजिक-सांस्कृतिक स्रोतों तथा विविध रूपों का ज्ञान प्राप्त करता है।
- CO 8. शिक्षार्थी पाठ्यक्रम में सम्मिलित लोक साहित्य के अध्ययन द्वारा लोक का व्यावहारिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

लोक साहित्य : परिभाषा एवं स्वरूप, लोक संस्कृति और लोक साहित्य, लोक साहित्य के अध्ययन की प्रक्रिया और संकलन की समस्याएँ। लोक- साहित्य के प्रमुख रूप - 1. लोक गीत : अर्थ एवं स्वरूप, संस्कार गीत, व्रत गीत, श्रम परिहार गीत और ऋतुगीत। 2. लोक नाट्य : अर्थ, स्वरूप और विशेषताएँ, विविध रूप यथा रामलीला, स्वाँग, यक्षगान, भवाई, नाच, तमाशा, नौटंकी, जात्रा, कथकली आदि। 3. लोक कथा : अर्थ एवं स्वरूप, व्रतकथा, परीकथा, नागकथा, बोधकथा आदि(सौतेलि इज, भै भूको मै सिती)। 4. लोकगाथा : अर्थ एवं स्वरूप, उत्पत्ति, परम्परा, सामान्य प्रवृत्तियाँ, प्रस्तुति। प्रसिद्ध लोकगाथाएँ - राजुला-मालूशाही, गौरा-महेश्वर, तीलू रौतेली। (पाठ्यपुस्तक प्रो. चन्द्रकला रावत द्वारा सम्पादित)

XI

एकादश प्रश्नपत्र - हिन्दी पत्रकारिता (षष्ठ सत्र)

- CO 1. शिक्षार्थी को पत्रकारिता के स्वरूप और प्रमुख प्रकारों का ज्ञान होता है।
- CO 2. शिक्षार्थी को हिन्दी पत्रकारिता के उद्भव और विकास का ज्ञान होता है।
- CO 3. शिक्षार्थी को पत्रकारिता के मूल तत्वों का ज्ञान होता है।
- CO 4. शिक्षार्थी को सम्पादन कला के विभिन्न आयामों का ज्ञान होता है।
- CO 5. शिक्षार्थी को पत्रकारिता से जुड़ी लेखन प्रविधियों का ज्ञान होता है।
- CO 6. शिक्षार्थी को प्रेस कानून तथा प्रेस आचार संहिता का ज्ञान होता है।
- CO 7. शिक्षार्थी को लोकतंत्र में मुक्त पत्रकारिता के महत्व का ज्ञान प्राप्त होता है।

निर्धारित पाठ्यक्रम

- हिन्दी पत्रकारिता : 1. पत्रकारिता का स्वरूप और प्रमुख प्रकार
2. हिन्दी पत्रकारिता का उद्भव और विकास
3. समाचार पत्रकारिता के मूल तत्व : समाचार संकलन तथा लेखन के मुख्य आयाम
4. सम्पादन कला के सामान्य सिद्धान्त, शीर्षकीकरण, पृष्ठ विन्यास, आमुख और समाचार पत्र की प्रस्तुति प्रक्रिया
5. दृश्य सामग्री (कार्टून, रेखाचित्र, ग्राफिक्स) की व्यवस्था और फोटोपत्रकारिता
6. पत्रकारिता से सम्बन्धित लेखन : सम्पादकीय, फीचर, रिपोर्टाज, साक्षात्कार, खोजी समाचार, अनुवर्तन आदि की प्रविधि
7. प्रेस संबंधी प्रमुख कानून तथा आचार संहिता
8. प्रजातांत्रिक व्यवस्था में चतुर्थ स्तम्भ के रूप में पत्रकारिता का दायित्व

XII

द्वादश प्रश्नपत्र - उत्तराखंड का हिन्दी साहित्य (षष्ठ सत्र)

- CO 1. शिक्षार्थी को आधुनिक हिन्दी साहित्य में उत्तराखंड के महत्वपूर्ण लेखकों की उपस्थिति व महत्व का ज्ञान प्राप्त होता है।
CO 2. शिक्षार्थी को आधुनिक काल में उत्तराखंड के हिन्दी साहित्य की समृद्ध परम्परा का ज्ञान प्राप्त होता है।
CO 3. शिक्षार्थी को उत्तराखंड के कवियों का परिचय व उनके कृतित्व का ज्ञान प्राप्त होता है।
CO 4. शिक्षार्थी को उत्तराखंड के निबंधकारों का परिचय व उनके कृतित्व का ज्ञान प्राप्त होता है।
CO 5. शिक्षार्थी को उत्तराखंड के कहानीकारों का परिचय व उनके कृतित्व का ज्ञान प्राप्त होता है।

निर्धारित पाठ्यक्रम

उत्तराखंड का हिन्दी साहित्य : लीलाधर जगूड़ी, मंगलेश डबराल, बलवंत मनराल और तारा पांडे की कविताएँ। पीताम्बरदत्त बड़थवाल, रमेशचंद्र शाह और शिवानंद नौटियाल के निबंध। रमाप्रसाद धिल्लियाल 'पहाड़ी', यमुनादत्त वैष्णव 'अशोक', पानू खोलिया और सुभाष पंत की कहानियां।
(पाठ्यपुस्तक प्रो. जगत सिंह बिष्ट द्वारा सम्पादित)

एम. ए. हिन्दी

Programme Outcomes

- PO 1. साहित्य ऐसा स्रोत है, जो समाज व उसकी दशा, गति, दिशा, उसके उद्वेलन आदि को सजीवता से चित्रित करता है। शिक्षार्थी परास्नातक स्तर पर हिन्दी साहित्य का अध्ययन करते हुए अपनी सांस्कृतिक, ऐतिहासिक और सामाजिक गत्यात्मकता की पहचान प्राप्त करता है।
- PO 2. हिन्दी साहित्य आदिकाल से भारत के इतिहासक्रम में मुस्लिमों के आगमन और तत्कालीन सामाजिक, समावेशीकरण/समांगीकरण राज व्यवस्था, धर्म, भक्ति के विभिन्न पंथ, सूफी, संत, नाथ, सिद्ध, निर्गुण-सगुण, रीति, राज्याश्रयी श्रृंगाराभिव्यक्ति आदि से लेकर आधुनिक काल की विभिन्न विचारधाराओं/आंदोलनों और अद्यतन उत्तरआधुनिक वैचारिक परिदृश्य तक एक सुदीर्घ-सुलिखित दस्तावेज़ की तरह है। शिक्षार्थी परास्नातक स्तर पर हिन्दी साहित्य के अध्ययन से साहित्य के साथ-साथ इस लम्बी परम्परा का भी ज्ञान प्राप्त करता है।
- PO 3. शिक्षार्थी साहित्य के पारंपरिक सांस्कृतिक आग्रहों के प्रति, नैतिक मूल्यों के प्रति सचेत होने के साथ-साथ इस महान भारतीय परम्परा के अग्रगामी आधुनिक स्वरूप का भी ज्ञान प्राप्त करता है।
- PO 4. भौतिकवादी जगत में निरन्तर बदलते जीवन मूल्यों से उपजी आस्था-अनास्था, आशा-निराशा, संगति-विसंगति आदि में जीते मानव समाज को सही दिशा निर्देश साहित्य ही करता है। शिक्षार्थी परास्नातक स्तर पर हिन्दी साहित्य का अध्ययन कर सही व सच्चे अर्थ में समुन्नत जीवनमूल्यों का धारक मनुष्य बनता है।
- PO 5. शिक्षार्थी संघ लोक सेवा आयोग तथा राज्य लोक सेवा आयोगों की प्रतियोगी परीक्षाओं हेतु विशिष्ट विषय के रूप में हिन्दी साहित्य का समग्र ज्ञान प्राप्त करता है।
- PO 6. शिक्षार्थी हिन्दी अनुवाद तथा हिन्दी पत्रकारिता जैसे रोजगार क्षेत्रों में कार्य करने हेतु आधारभूत ज्ञान प्राप्त करता है।
- PO 7. शिक्षार्थी उच्चस्तरीय शोध एवं उच्चशिक्षा में अध्यापन हेतु आधारभूत ज्ञान तथा योग्यता प्राप्त करता है।

परास्नातक हिन्दी का पाठ्यक्रम तथा निर्गम

I

प्रथम प्रश्नपत्र - आदिकालीन एवं निर्गुण काव्य(प्रथम सत्र)

- CO1. शिक्षार्थी आदिकाल के कवि अब्दुल रहमान की कृति संदेस रासक के अध्ययन से हिन्दी भाषा के आदिकालीन तथा अपभ्रंश के परवर्ती रूप अवहट्ट का परिचय तथा ज्ञान प्राप्त करता है।

- CO2. शिक्षार्थी आदिकाल के प्रसिद्ध महाकाव्य पृथ्वीराज रासो के अध्ययन से वीरकाव्य की परम्परा तथा आदिकालीन हिन्दी के राजस्थानी प्रभाव वाले अवहट्ट रूप का परिचय तथा ज्ञान प्राप्त करता है।
- CO3. संस्कृत में जयदेव का गीतकाव्य अत्यन्त महत्वपूर्ण है। हिन्दी में यह महत्व विद्यापति को प्राप्त है। शिक्षार्थी विद्यापति के पदों के अध्ययन से गीतकाव्य की समृद्ध भारतीय परम्परा तथा मैथिली भाषा का परिचय तथा ज्ञान प्राप्त करेगा।
- CO4. शिक्षार्थी कबीर की वाणी का अध्ययन करते हुए हिन्दी भक्तिकाव्य में निर्गुण के स्वरूप तथा हिन्दी की संतकाव्य परम्परा का निकट परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी मलिक मोहम्मद जायसी के महाकाव्य पद्मावत का अध्ययन करते हुए हिन्दी भक्तिकाव्य में प्रेमाश्रयी सूफी काव्यधारा का ऐतिहासिक एवं सैद्धान्तिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम

1. अब्दुल रहमान: संदेश रासक, संपा० डा. विश्वनाथ त्रिपाठी (व्याख्या हेतु, प्रथम प्रक्रम)
2. चंदवरदाई: कयमास-वध, संपा० राजेश्वरप्रसाद चतुर्वेदी, प्रकाशन केन्द्र, सीतापुर रोड, लखनऊ।
3. विद्यापति: संपा० शिवप्रसाद सिंह (व्याख्या हेतु केवल प्रार्थना एवं रूप वर्णन), लोकभारती प्रकाशन, इलाहाबाद।
4. कबीरदास: कबीर वाणी पीयूष, संपा० जयदेव सिंह/वासुदेव सिंह (व्याख्या हेतु प्रारंभ की 50 सांख्यियाँ एवं प्रारम्भ के 10 पद), विश्वविद्यालय प्रकाशन, वाराणसी।
5. मलिक मुहम्मद जायसी: जायसी ग्रंथावली, संपा० रामचंद्र शुक्ल; (व्याख्या हेतु केवल 'नागमती वियोग' वर्णन खंड)।

II

द्वितीय प्रश्न-पत्र - सगुण काव्य एवं रीतिकालीन काव्य(प्रथम सत्र)

- CO1. शिक्षार्थी मध्यकालीन सगुण भक्तिधारा व उसकी शाखाओं से रीतिकालीन काव्य तक की विभिन्न धाराओं का ऐतिहासिक परिचय एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी सूरदास की रचनाओं का अध्ययन कर सगुण धारा की कृष्णभक्ति शाखा का आलोचनात्मक व सैद्धान्तिक ज्ञान प्राप्त करता है तथा सूरदास के काव्य में उपस्थित प्रकृति और जीवन के लोक स्वरूप का साक्षात्कार कर पर्यावरण की सुन्दरता व उसके संरक्षण की अनिवार्यता के महत्व को समझता है।
- CO3. शिक्षार्थी तुलसी दास के काव्य का अध्ययन कर सगुण धारा की रामभक्ति शाखा का आलोचनात्मक व सैद्धान्तिक ज्ञान तथा विभिन्न धार्मिक-सामाजिक मान्यताओं व मतों के बीच समन्वय की दृष्टि प्राप्त करता है। यह समन्वयवादी दृष्टि शिक्षार्थी के अपने निजी

जीवन में भी विभिन्न क्षेत्रों में सफलता हेतु सहायक होती है।

- CO4. शिक्षार्थी केशवदास के काव्य के अध्ययन से भारतीय काव्यशास्त्र का परम्परागत ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी बिहारी के काव्य के अध्ययन से कविता में भाषा में मितकथन व अलंकारों के सटीक प्रयोग का रचनात्मक व आलोचनात्मक ज्ञान प्राप्त करता है, जिससे उसमें काव्यात्मक अभिरुचि का विकास एवं विस्तार होता।
- CO6. शिक्षार्थी घनानंद की कविता के अध्ययन से सामाजिक रूढ़ियों के बीच प्रेम की विलक्षण अनुभूति से परिचित होता है, जिससे वह तत्कालीन से लेकर समकालीन समाज तक की सम्बन्ध आधारित जटिल संरचना के ज्ञान के साथ ही विवेचन की मनोवैज्ञानिक समझ भी प्राप्त करता है।

निर्धारित पाठ्यक्रम

1. सूरदास: भ्रमरगीत सार: संपा0 आचार्य रामचंद्र शुक्ल (व्याख्या के लिए पद संख्या 50 से 100 तक), नागरी प्रचारिणी सभा, वाराणसी।
2. तुलसीदास: विनयपत्रिका: तुलसीदास (व्याख्या के लिए पद संख्या 51 से 100 तक), गीताप्रेस गोरखपुर।
3. केशवदास: संक्षिप्त रामचन्द्रिका: संपा0 डा. जगन्नाथ तिवारी। (व्याख्या हेतु प्रारंभिक पाँच प्रकाश- 1. मंगलाचरण, 2. अयोध्यापुरी वर्णन, 3. सीता स्वयंवर, 4. परशुराम संवाद, 5. वन मार्ग में राम, रंजन प्रकाशन, सिटी स्टेशन मार्ग आगरा।
4. बिहारी: बिहारी नवनीत: संपा0 रवीन्द्र कुमार जैन (व्याख्या हेतु प्रारंभिक 50 दोहे), नेशनल पब्लिशिंग हाउस, नई दिल्ली।
5. घनानंद: घनानंद कवित्त: संपा0 आचार्य विश्वनाथ प्रसाद मिश्र (व्याख्या हेतु आरंभ के 20 छंद)

III

तृतीय प्रश्नपत्र - भारतीय काव्यशास्त्र (प्रथम सत्र)

- CO1. शिक्षार्थी भारतीय काव्यशास्त्र की अत्यन्त समृद्ध परम्परा का ऐतिहासिक व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी काव्य लक्षणों, काव्य हेतु तथा काव्य प्रयोजनों के अध्ययन से कविता के शिल्प और विषयवस्तु से लेकर उसके वृहद् सामाजिक उद्देश्यों तक आलोचना का ज्ञान व प्रशिक्षण प्राप्त करता है।
- CO3. विभिन्न काव्य तत्वों के संधान के आधार पर परम्परा में आचार्यों ने काव्य विवेचन किया, फलस्वरूप रस, अलंकार, रीति, ध्वनि, वक्रोक्ति एवं औचित्य सम्प्रदाय अस्तित्व में आए,

जो पश्चिमी काव्य चिंतन में इस विस्तार के साथ नहीं मिलती। शिक्षार्थी इन काव्य सम्प्रदायों के अध्ययन से भारतीय परम्परा में काव्य चिंतन की विलक्षणता, गहराई और सैद्धान्तिक विस्तार का ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी हिन्दी आलोचना के उद्भव व विकास का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।

CO5. शिक्षार्थी हिन्दी के सामान्य आलोचना सिद्धान्तों का ज्ञान प्राप्त करता है।

CO6. शिक्षार्थी पाठ्यक्रम में सम्मिलित आलोचकों के कृतित्व के अध्ययन से हिन्दी आलोचना की विशिष्ट विचारधाराओं का ज्ञान प्राप्त करता है।

CO7. शिक्षार्थी साहित्यिक कृतियों के आलोचन का व्यावहारिक ज्ञान व प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. काव्यशास्त्र: परिभाषा, काव्य लक्षण, काव्य हेतु, काव्य प्रयोजन एवं काव्य भेद।
2. काव्य संप्रदाय: रस संप्रदाय: रस का स्वरूप, रस निष्पत्ति, साधारणीकरण, अलंकार संप्रदाय, रीति संप्रदाय, ध्वनि संप्रदाय, वक्रोक्ति संप्रदाय एवं औचित्य संप्रदाय।
3. हिन्दी आलोचना: विकास, प्रमुख हिन्दी आलोचक और उनके आलोचना सिद्धान्त (आचार्य रामचंद्र शुक्ल, आचार्य हजारीप्रसाद द्विवेदी, डा. नगेन्द्र, डा. रामविलास शर्मा, डा. नामवर सिंह)।

IV

चतुर्थ प्रश्न-पत्र-हिन्दी साहित्य का इतिहास: आदिकाल से रीतिकाल तक(प्रथम सत्र)

CO1. शिक्षार्थी हिन्दी साहित्य के इतिहास लेखन की परम्परा, प्रविधि, काल-विभाजन पद्धति, नामकरण की समस्या व औचित्य के कारणों का ऐतिहासिक व सैद्धान्तिक ज्ञान प्राप्त करता है।

CO2. शिक्षार्थी हिन्दी साहित्य के आदिकाल की प्रमुख प्रवृत्तियों तथा आदिकालीन हिन्दी साहित्य के अध्ययन से जैन साहित्य, बौद्ध साहित्य, नाथ साहित्य, वीरकाव्य-रासो साहित्य आदि का सैद्धान्तिक ज्ञान और चंद बरदाई, अब्दुल रहमान, जगनिक, स्वयंभू, धनपाल, नरपति नाल्ह, विद्यापति आदि महत्वपूर्ण कवियों के कृतित्व का ऐतिहासिक परिचय प्राप्त करता है।

CO3. शिक्षार्थी हिन्दी साहित्य के पूर्व मध्यकाल/भक्तिकाल के प्रमुख कवियों का ऐतिहासिक परिचय तथा प्रमुख काव्यधाराओं एवं प्रवृत्तियों का सैद्धान्तिक ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी हिन्दी साहित्य के उत्तर मध्यकाल /रीतिकाल की ऐतिहासिक पृष्ठभूमि का परिचय एवं प्रमुख प्रवृत्तियों का सैद्धान्तिक ज्ञान प्राप्त करता है।

CO5. शिक्षार्थी रीतिकालीन कवि-आचार्यों द्वारा रचित लक्षण ग्रंथों की परम्परा का ऐतिहासिक परिचय प्राप्त करता है।

CO6. शिक्षार्थी रीतिकाल की काव्यधाराओं यथा रीतिबद्ध, रीतिसिद्ध तथा रीतिमुक्त तथा उनके प्रतिनिधि कवियों का ऐतिहासिक परिचय एवं उनकी कविता के चमत्कारपूर्ण शिल्पगत वैशिष्ट्य का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. हिंदी साहित्य के इतिहास लेखन की परंपरा, काल विभाजन और नामकरण, हिंदी साहित्य का आदिकाल: नामकरण और प्रमुख प्रवृत्तियाँ, नाथ-सिद्ध साहित्य परंपरा, रासो काव्य परंपरा, आदिकाल के प्रतिनिधि कवि और उनकी रचनाएँ।
2. मध्यकाल: भक्तिकाल की ऐतिहासिक पृष्ठभूमि और प्रमुख प्रवृत्तियाँ, निर्गुण संत काव्य और उसकी प्रमुख प्रवृत्तियाँ, सूफी काव्य परंपरा।
3. भक्तिकाल की सगुण काव्यधारा: रामभक्ति परंपरा, कृष्णभक्ति परंपरा, भक्तिकाल के प्रमुख कवि और उनकी रचनाएँ।
4. रीतिकाल की ऐतिहासिक पृष्ठभूमि और प्रमुख प्रवृत्तियाँ, लक्षण ग्रंथ-परंपरा, रीतिकाल की काव्यधाराएँ: रीतिबद्ध, रीतिसिद्ध और रीतिमुक्त काव्य, प्रमुख कवि और उनकी रचनाएँ।

V

पंचम प्रश्न-पत्र - आधुनिक हिंदी काव्य : छायावाद तक (द्वितीय सत्र)

CO1. शिक्षार्थी आधुनिक कविता के आरम्भ का रचनात्मक परिचय व ज्ञान प्राप्त करता है।

CO2. शिक्षार्थी रत्नाकार के काव्य के अध्ययन से ब्रजभाषा के माधुर्य तथा भक्तिकालीन कृष्णभक्ति परम्परा में कवि के नवीन दृष्टिकोण का ऐतिहासिक परिचय व ज्ञान प्राप्त करता है।

CO3. शिक्षार्थी हिन्दी नवजागरण में खड़ी बोली हिन्दी में काव्यरचना के सशक्त आरम्भ के साक्ष्य प्राप्त करता है। मैथिलीशरण गुप्त कृत साकेत की विषयवस्तु उसे हिन्दी कविता में स्त्री के मूक संघर्षों व बलिदानों के चित्रण का महत्वपूर्ण अभिलेख बनाती है, शिक्षार्थी इस पुस्तक के अध्ययन से हिन्दी में स्त्री विमर्श के बहुत आरंभिक स्वरूप का ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी पाठ्यक्रम में सम्मिलित कवियों जयशंकर प्रसाद, सूर्यकांत त्रिपाठी निराला, सुमित्रानंदन पंत एवं महादेवी वर्मा और उनकी कविताओं के अध्ययन से छायावाद युग का ऐतिहासिक व सैद्धांतिक ज्ञान प्राप्त करता है।

CO5. शिक्षार्थी छायावादी कविता के अध्ययन से प्रकृति, प्रेम, सौन्दर्य, भारत की गहन भारतीय परम्परा तथा विचार की नवीन आधुनिक सरणियों/पद्धतियों का रचनात्मक एवं सैद्धांतिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. जगन्नाथदास 'रत्नाकर': उद्धत शतक (व्याख्या हेतु प्रारंभिक 25 पद), नागरी प्रचारिणी सभा काशी ।
2. मैथिलीशरण गुप्त: साकेत (व्याख्या के लिए केवल नवम सर्ग), साकेत प्रकाशन, चिरगांव झाँसी ।
3. जयशंकर प्रसाद: कामायनी (व्याख्या के लिए केवल श्रद्धा और इड़ा सर्ग), नेशनल पब्लिशिंग हाउस, नई दिल्ली ।
4. सूर्यकांत त्रिपाठी निराला: राग-विराग, संपा० रामविलास शर्मा (व्याख्या के लिए 'राम की शक्तिपूजा'), लोकभारती प्रकाशन, महात्मा गाँधी मार्ग, इलाहाबाद ।
5. सुमित्रानंदन पंत: रश्मिबंध (व्याख्या के लिए प्रारंभिक 15 कविताएँ), राजकमल प्रकाशन, नई दिल्ली ।
6. महादेवी वर्मा: संधिनी (व्याख्या के लिए कविता संख्या 25 से 40 तक), लोकभारती प्रकाशन, महात्मा गाँधी मार्ग, इलाहाबाद ।

VI

षष्ठ प्रश्न-पत्र - पाश्चात्य काव्यशास्त्र(द्वितीय सत्र)

- CO1. शिक्षार्थी साहित्यालोचन की पश्चिमी परम्परा का विस्तृत ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है ।
- CO2. शिक्षार्थी प्राचीन यूनानी विचारक प्लेटो, अरस्तू तथा लॉगिनुस की काव्य मूल्यांकन सम्बन्धी मान्यताओं और स्थापनाओं यथा काव्य-सत्य, अनुकरण व विरेचन, त्रासदी विवेचन, उदात्त की अवधारणा आदि का ऐतिहासिक तथा सैद्धान्तिक परिचय प्राप्त करता है ।
- CO3. शिक्षार्थी अंग्रेज़ी के महत्वपूर्ण साहित्यालोचक मैथ्यू आर्नल्ड, क्रोचे, आई ए रिचर्ड्स और डी एस इलियट के समालोचन सिद्धान्तों का ऐतिहासिक परिचय व ज्ञान प्राप्त करता है ।
- CO4. शिक्षार्थी अत्यन्त महत्वपूर्ण अंग्रेज़ी कवि वर्ड्सवर्थ के काव्यभाषा सिद्धान्त और कॉलरिज के कल्पना सिद्धान्त के अध्ययन से पश्चिम के प्रसिद्ध साहित्यान्दोलन स्वच्छंदतावाद का ऐतिहासिक परिचय और सैद्धान्तिक ज्ञान प्राप्त करता है ।
- CO5. शिक्षार्थी पश्चिमी साहित्य और संस्कृति की महत्वपूर्ण विचारधाराओं यथा मनोविश्लेषणवाद, अस्तित्ववाद, संरचनावाद और उत्तरआधुनिकता का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है ।
- CO6. शिक्षार्थी पाठ्यक्रम में सम्मिलित विचारकों व उनके सिद्धान्तों के अध्ययन से आलोचना का ज्ञान व प्रशिक्षण प्राप्त करता है ।

निर्धारित पाठ्यक्रम:

1. पाश्चात्य काव्यशास्त्र: संक्षिप्त परिचय, प्लेटो के काव्य सिद्धांत, अरस्तू: अनुकरण सिद्धांत, विरेचन सिद्धांत एवं त्रासदी विवेचन, लॉजाइन्स: उदात्त की अवधारणा एवं भेद।
2. मैथ्यू आर्नल्ड: कला और नैतिकता का सिद्धांत, क्रोचे: अभिव्यंजनावाद, आई० ए० रिचर्ड्स: काव्यमूल्य, टी० एस० इलियट: कला की निर्वैयक्तिकता का सिद्धांत।
3. वर्ड्सवर्थ: काव्यभाषा सिद्धांत, कालरिज: कल्पना सिद्धांत।
4. विविध वाद: स्वच्छंदतावाद, मनोविश्लेषणवाद, अस्तित्ववाद, संरचनावाद, उत्तर आधुनिकतावाद।

VII

सप्तम प्रश्न-पत्र - हिंदी साहित्य का इतिहास : आधुनिक काल (द्वितीय सत्र)

- CO1. शिक्षार्थी हिन्दी साहित्य के आधुनिक काल का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी आधुनिक काल के राजनीतिक, सामाजिक तथा सांस्कृतिक परिदृश्य का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी आधुनिक काल में अस्तित्व में आए साहित्यिक आंदोलनों अथवा विशिष्ट धाराओं यथा छायावाद, प्रगतिवाद, प्रयोगवाद आदि का सैद्धान्तिक ज्ञान तथा नवीन रचना-दृष्टि के आलोक में उनके प्रमुख रचनाकारों का परिचय प्राप्त करता है।
- CO4. शिक्षार्थी हिन्दी में गद्य लेखन के उद्भव-विकास तथा गद्य की प्रमुख विधाओं यथा नाटक, कहानी, उपन्यास और निबंध का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी कथेतर गद्य के अन्तर्गत स्मारक साहित्य और उसकी विधाओं यथा संस्मरण, रेखाचित्र, जीवनी, आत्मकथा, यात्रावृत्तांत, फीचर, डायरी, रिपोर्टाज आदि का परिचय व ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. आधुनिक काल की पृष्ठभूमि: भारतेन्दु युग: प्रमुख प्रवृत्तियाँ, प्रमुख रचनाकार एवं उनकी रचनाएँ, द्विवेदी युग: प्रमुख प्रवृत्तियाँ, प्रमुख रचनाकार एवं उनकी रचनाएँ।
2. छायावाद: प्रमुख प्रवृत्तियाँ, प्रमुख रचनाकार एवं उनकी रचनाएँ, छायावादोत्तर युग: प्रगतिवाद, प्रयोगवाद: प्रमुख प्रवृत्तियाँ, प्रमुख रचनाकार एवं उनकी रचनाएँ, समकालीन हिंदी साहित्य: पृष्ठभूमि, प्रवृत्तियाँ एवं प्रमुख कवि।
3. हिंदी गद्य साहित्य का विकास: नाटक, एकांकी, उपन्यास, कहानी एवं निबंध।
4. हिंदी का स्मारक साहित्य: संस्मरण, रेखाचित्र, जीवनी, आत्मकथा, यात्रावृत्तांत, फीचर, डायरी, रिपोर्टाज आदि।

VIII

अष्टम प्रश्न-पत्र - हिंदी कथा एवं नाटक साहित्य (द्वितीय सत्र)

- CO1. शिक्षार्थी हिन्दी उपन्यास, कहानी तथा नाटक के उद्भव-विकास तथा महत्व का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी गोदान के अध्ययन से भारतीय समाज की राजनीतिक, आर्थिक और सांस्कृतिक संरचना का अंतरंग साक्षात्कार करते हुए बदल रही जीवन स्थितियों और नए संकटों-समस्याओं को समझने की वैचारिक पद्धति का ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी कगार की आग के अध्ययन से भारतीय समाज में दलित एवं शोषित वर्ग की पीड़ा का साक्षात्कार करते हुए एक नए सामाजिक-राजनीतिक विमर्श का परिचय व ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी पाठ्यक्रम में सम्मिलित कहानियों के अध्ययन से हिन्दी कहानी के विकासक्रम, उनके बहुवर्णी सामाजिक कथ्य, प्रमुख कहानी आंदोलनों तथा बदलते शिल्प का परिचय व ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी पाठ्यक्रम में सम्मिलित नाटक स्कंदगुप्त तथा लहरों के राजहंस के अध्ययन से हिन्दी नाट्यलेखन के विकास, भारतीय व पश्चिमी परम्परा में उसके शिल्पगत रचाव, नाटक के ऐतिहासिक-सामाजिक अभिप्रायों, प्रकारों तथा रंगमंच विधा का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी कथा साहित्य तथा नाटक की समीक्षा का व्यावहारिक प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. प्रेमचंद: गोदान, सरस्वती प्रेस, इलाहाबाद।
2. हिमांशु जोशी: कगार की आग, भारतीय ज्ञानपीठ, दिल्ली।
3. सं० बटरोही: हिंदी कहानी के नौ कदम, अल्मोड़ा बुक डिपो, अल्मोड़ा।
4. जयशंकर प्रसाद: स्कन्दगुप्त, लीडर प्रेस, इलाहाबाद।
5. मोहन राकेश: लहरों के राजहंस, राधाकृष्ण प्रकशन नई दिल्ली।
6. संपा० राकेश गुप्त एवं चतुर्वेदी: एकांकी मानस (संक्षिप्त संस्करण), ग्रंथायन, अलीगढ़।

IX

नवम प्रश्नपत्र - आधुनिक हिंदी काव्य : छायावादोत्तर (तृतीय सत्र)

- CO1. शिक्षार्थी छायावादोत्तर हिन्दी कविता और उसकी विभिन्न काव्यधाराओं यथा प्रगतिवाद, प्रयोगवाद, नई कविता, साठोत्तरी कविता, समकालीन कविता आदि का रचनात्मक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी दिनकर के महाकाव्य उर्वशी के अध्ययन से भारतीय दर्शन की परम्परा से परिचित होता है तथा आधुनिक संसार में उसकी पुनर्व्याख्या का संधान करता है, जिससे उसे

भेदबुद्धि यथा पाप-पुण्य, स्वर्ग-नर्क, ऊँच-नीच आदि से ऊपर उठकर संसार को समझने की चेतना, प्रेरणा व ज्ञान प्राप्त होता है।

- CO3. शिक्षार्थी नागार्जुन की प्रतिनिधि कविताओं के अध्ययन से प्रगतिशील हिन्दी कविता के स्रोत सिद्धान्तों का ज्ञान प्राप्त करता है। वह देश की वंचित, विपन्न, जातीय व वर्गीय भेदभाव की शिकार साधारण जनता की पीड़ा और संघर्ष को समझने की प्रेरणा पाता है तथा कविता में उस पीड़ा और संघर्ष की अभिव्यक्ति से काव्य-प्रयोजन की एक सर्वथा नवीन दिशा का ज्ञान सोदाहरण प्राप्त करता है।
- CO4. शिक्षार्थी अज्ञेय, मुक्तिबोध, शमशेर बहादुर सिंह, नरेश मेहता, केदारनाथ सिंह, लीलाधर जगूड़ी, अशोक वाजपेयी आदि की कविताओं के अध्ययन से प्रयोगवाद, नयी कविता, साठोत्तरी कविता, समकालीन कविता आदि का रचनात्मक व सैद्धान्तिक ज्ञान सोदाहरण प्राप्त करता है।
- CO5. शिक्षार्थी छायावादोत्तर काल की हिन्दी कविता की समीक्षा का रचनात्मक ज्ञान व प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. रामधारी सिंह दिनकर: उर्वशी (व्याख्या के लिए केवल तृतीय सर्ग)। प्रकाशक: उदयांचल प्रकाशन, राजेन्द्र नगर, पटना।
2. वैद्यनाथ मिश्र 'नागार्जुन': नागार्जुन' की प्रतिनिधि कविताएँ, (उनको प्रणाम, बतौलत ब्रेख्त, बादल को घिरते देखा है, बहुतदिनों के बाद, मेरी भी आभा है इसमें, सोनियासमन्दर, प्रतिबद्ध हूँ, वो हमें चेतावनी देने आये थे, सिन्दूर तिलकित भाल, वह दन्तुरित मुस्कान, यह तुम थीं, गुलाबीचूडियाँ, खुरदरे पैर, घिन तो नहीं आती है गीले पाँख की दुनिया गई है छोड़, प्रेत का बयान, अकाल और उसके बाद, आओ रानी हम ढोयेंगे पालकी, शासन की बन्दूक, पसीने का गुण-धर्म,) राजकमल प्रकाशन, नई दिल्ली।
3. संपादक: डा. मधुबाला नयाल: समय राग। (व्याख्या हेतु सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय', गजानन माधव मुक्तिबोध, शमशेर बहादुर, नरेश मेहता, केदारनाथ सिंह, अशोक वाजपेयी, लीलाधर जगूड़ी और अरुण कमल की सभी रचनाएँ), ज्ञानोदय प्रकाशन, नैनीताल।

X

दशम प्रश्नपत्र - भाषा विज्ञान (तृतीय सत्र)

- CO1. Linguistics अर्थात् भाषा-विज्ञान भाषा एवं साहित्य ही नहीं, अभिव्यक्तियों के सन्दर्भ में समाज को समझने की पद्धति के रूप में विकसित होने वाला विषय भी है। अतः इस पाठ्यक्रम से शिक्षार्थी भाषा विज्ञान के अर्थ, स्वरूप, भाषा व्यवस्था, भाषा व्यवहार और

उसके महत्व का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।

CO2. शिक्षार्थी भाषा प्रयोगशालाओं में उच्चस्तरीय अध्ययन व शोध हेतु आधार योग्यता व ज्ञान प्राप्त करता है।

CO3. शिक्षार्थी भाषा विज्ञान की प्रमुख अध्ययन-शाखाओं यथा स्वन, स्वनिम, रूप, रूपिम, वाक्य, अर्थ आदि का सैद्धान्तिक व तकनीकी ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी भाषा की सामाजिक संरचनाओं तथा भाषा के स्वरूप के आधार पर सामाजिक अभिव्यक्ति के अध्ययन का ज्ञान व प्रशिक्षण प्राप्त करता है।

CO5. शिक्षार्थी साहित्यिक कृतियों के भाषा वैज्ञानिक अध्ययन का ज्ञान व प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. भाषा और भाषा विज्ञान: भाषा की परिभाषा और अभिलक्षण, भाषा व्यवस्था और भाषा व्यवहार, भाषा संरचना और भाषिक-प्रकार्य, साहित्य के अध्ययन में भाषाविज्ञान की उपयोगिता।
2. स्वन प्रक्रिया: स्वनविज्ञान का स्वरूप और शाखाएँ, वाग् अवयव और उनके कार्य, स्वन की अवधारणा और स्वनों का वर्गीकरण, स्वनगुण, स्वनिक परिवर्तन, स्वनिम विज्ञान का स्वरूप, स्वनिम की अवधारणा, स्वनिम के भेद, स्वनिमिक विश्लेषण।
3. रूपप्रक्रिया: रूपप्रक्रिया का स्वरूप और शाखाएँ, रूपिम की अवधारणा और भेद: मुक्त-आबद्ध, अन्विताभिधानवाद, वाक्य के भेद, वाक्य विश्लेषण, निकटस्थ-अवयव विश्लेषण, गहन संरचना और बाह्य संरचना।
4. अर्थविज्ञान: अर्थ की अवधारणा, शब्द और अर्थ का संबंध, पर्यायता, अनेकार्थता, विलोमता, अर्थ-परिवर्तन।

XI

एकादश प्रश्नपत्र - निबंध एवं स्मारक साहित्य (तृतीय सत्र)

CO1. शिक्षार्थी निबंध विधा के स्वरूप, प्रकार और महत्व का सैद्धान्तिक ज्ञान प्राप्त करता है।

CO2. शिक्षार्थी हिन्दी में निबंध विधा के उद्भव एवं विकास का ऐतिहासिक परिचय प्राप्त करता है।

CO3. शिक्षार्थी पाठ्यक्रम में सम्मिलित निबंधों के अध्ययन से हिन्दी के प्रमुख निबंधकारों का परिचय, निबंध की शैलियों तथा विधा का वैचारिक व रचनात्मक ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी स्मारक साहित्य के स्वरूप, उसकी विभिन्न विधाओं तथा महत्व का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।

CO5. शिक्षार्थी निबंध तथा स्मारक साहित्य की समीक्षा का ज्ञान तथा प्रशिक्षण प्राप्त करता है।
निर्धारित पाठ्यक्रम:

1. नीरजा टंडन: हिंदी निबंध मंजूषा (पाठ्यक्रम में निर्धारित निबन्ध- सच्ची कविता (बालकृष्ण भट्ट), सच्ची वीरता (सरदार पूर्णसिंह), काव्य में लोकमंगल की साधनावस्था (रामचन्द्र शुक्ल), देवदारू(हजारीप्रसाद द्विवेदी), अनुभूति, सत्य और यथार्थ(महादेवीवर्मा), प्रेमचन्द के फटे जूते (हरिशंकर परसाई), कविता का भविष्य (रामधारीसिंह दिनकर), चेतना का संस्कार (अज्ञेय), आदिकाव्य(रामविलासशर्मा), साहित्य का स्तर)डॉ.नगेन्द्र, आम्रमंजरी(विद्यानिवासमिश्र), अपनी ही मौत पर (धर्मवीर भारती), राघव: करुणोरस: (कुबेरनाथराय), निबन्ध की तलाश में (रमेशचन्द्रशाह) ।
2. महादेवी वर्मा: पथ के साथी, लोकभारती प्रकाशन, इलाहाबाद ।
3. केशवदत्त रुवाली/जगतसिंह बिष्ट: स्मारक साहित्य संग्रह, तारामंडल प्रकाशन, अलीगढ़ ।

XII

द्वादश प्रश्नपत्र - हिंदी भाषा (तृतीय सत्र)

- CO1. शिक्षार्थी भारत की प्राचीन, मध्यकालीन तथा आधुनिक आर्यभाषाओं का ऐतिहासिक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी हिन्दी के भौगोलिक विस्तार, उपभाषाओं और बोलियों के अत्यन्त समृद्ध संसार का परिचय एवं ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी हिन्दी की भाषिक संरचना का विस्तृत रचनात्मक परिचय एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी हिन्दी भाषा के विविध रूपों, हिन्दी की संवैधानिक स्थिति एवं हिन्दी के वैश्विक महत्व का परिचय एवं ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी नए डिजिटल संसार में कम्प्यूटर पर हिन्दी के प्रयोग की प्रविधियों, तकनीक और भाषा शिक्षण का ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO6. शिक्षार्थी रोजगार अथवा आजीविका के क्षेत्र में हिन्दी भाषा के व्यवहार का ज्ञान एवं प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. हिंदी की ऐतिहासिक पृष्ठभूमि: प्राचीन भारतीय आर्यभाषाएँ: वैदिक तथा लौकिक संस्कृत और उनकी विशेषताएँ। मध्यकालीन भारतीय आर्यभाषाएँ: पालि, प्राकृत, शौरसेनी, अर्धमागधी, मागधी। अपभ्रंश और उनकी विशेषताएँ। आधुनिक भारतीय आर्यभाषाएँ और उनका वर्गीकरण।
2. हिंदी का भौगोलिक विस्तार: हिंदी की उपभाषाएँ, पश्चिमी हिंदी, पूर्वी हिंदी, राजस्थानी,

बिहारी तथा पहाड़ी और उनकी बोलियाँ, कुमाउनी और गढ़वाली की विशेषताएँ।

3. हिंदी का भाषिक स्वरूप: हिंदी शब्द रचना: उपसर्ग, प्रत्यय, समास, रूपरचना-लिंग, वचन और कारक व्यवस्था के संदर्भ में हिंदी के संज्ञा, सर्वनाम, विशेषण और क्रियारूप, हिंदी वाक्य-रचना, पदक्रम और अन्विति।
4. हिन्दी के विविधरूप -सम्पर्क भाषा, राष्ट्रभाषा, राजभाषा के रूप में हिन्दी, माध्यम भाषा, संचारभाषा, हिन्दी की संवैधानिक स्थिति तथा वर्तमान वैश्विक सन्दर्भ में हिन्दी
5. हिंदी में कम्प्यूटर सुविधाएँ: आँकड़ा-संसाधन और शब्द-संसाधन, वर्तनी-शोधक, मशीनी अनुवाद, हिंदी भाषा-शिक्षण।

XIII (क)

त्रयोदश प्रश्नपत्र (क)- कुमाउनी साहित्य (चतुर्थ सत्र)

- CO1. भाषा और साहित्य की नयी उत्तरसंरचनावादी पद्धति में स्थानीय भाषाओं और उनके साहित्य के अध्ययन का महत्व बढ़ा है। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी कुमाउनी साहित्य का रचनात्मक परिचय एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी पाठ्यक्रम में सम्मिलित **पछ्याण** तथा **इजा** नामक पुस्तकों के अध्ययन से कुमाउनी कविता का रचनात्मक-शिल्पगत परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी पाठ्यक्रम में सम्मिलित पुस्तक **मन्याडर** के अध्ययन से से कुमाउनी कहानी का रचनात्मक-शिल्पगत परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी पाठ्यक्रम में सम्मिलित पुस्तक **मन्खि** के अध्ययन से कुमाउनी निबंध का रचनात्मक-शिल्पगत परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी पाठ्यक्रम में सम्मिलित पुस्तक **आपण पन्यार** के अध्ययन से कुमाउनी नाटक का रचनात्मक-शिल्पगत परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. सं० डा. दिवा भट्ट: पछ्याण, श्री अल्मोड़ा बुक डिपो, अल्मोड़ा।
2. डा. शेरसिंह बिष्ट: इजा। (व्याख्या हेतु- 1. बाट, 2. चाणै में छुँ, 3. कास छी उँ मैस, 4. रितु बदव, 5. हे राम, 6. गौं-घर, 7. शहरी गौं दुदी, 8. उन दिन, 9. नई सुराज, 10. इजा)। प्रकाशक: गोपेश प्रकाशन, अल्मोड़ा। -
3. बहादुर बोरा 'श्रीबंधु': मन्याडर, कुमाउनी भाषा-साहित्य प्रचार-प्रसार समिति, अल्मोड़ा।
4. डा. शेरसिंह बिष्ट: मन्खि, अविचल प्रकाशन, बिजनौर (उ०प्र०)। -
5. सं० दामोदर जोशी: आपण पन्यार, जगदम्बा कम्प्यूटर्स, कालाढूंगी रोड, हल्द्वानी (नैनीताल)।

अथवा

XIII (ख)

त्रयोदश प्रश्नपत्र (ख) - उत्तराखण्ड के हिंदी कवि (चतुर्थ सत्र)

- CO1. आधुनिक हिन्दी कविता परम्परा में उत्तराखण्ड राज्य के कवियों का अत्यन्त महत्वपूर्ण स्थान है। शिक्षार्थी इस परम्परा और उसमें उत्तराखण्ड के कवियों के महत्व का ऐतिहासिक परिचय प्राप्त करता है।
- CO2. गुमानी ने भारतेंदु युग से पूर्व काव्य में खड़ी बोली का प्रयोग किया था। उनकी कविता तत्कालीन अंग्रेजी/कम्पनी राज और सामाजिक-राजनीतिक स्थितियों के सजीव चित्र प्रस्तुत करती हैं। शिक्षार्थी खड़ी बोली हिन्दी के प्रथम कवि गुमानी के कृतित्व का ऐतिहासिक-रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO3. चन्द्रकुंवर बर्वाल छायावाद और प्रगतिवाद के संधिकाल के प्रमुख एवं महत्वपूर्ण कवि हैं। शिक्षार्थी उनके कृतित्व का रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO4. लीलाधर जगूड़ी साठोत्तरी हिन्दी कविता के प्रमुख कवि हैं। स्वतंत्रता प्राप्ति के बीस वर्ष पश्चात मोहभंग और अवसाद से लड़ रहे आक्रोशित देश और समाज का स्वर उनकी कविता का आरंभिक स्वर है। वे आज भी सक्रिय और रचनारत हैं। शिक्षार्थी उनके कृतित्व का रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO5. वीरेन डंगवाल एवं मंगलेश डबराल समकालीन हिन्दी कविता में अस्सी के दशक के दो सबसे महत्वपूर्ण कवि हैं। वे हिन्दी कविता की प्रगतिशील परम्परा के नए संवाहक हैं, जिनकी अभिव्यक्ति जनसाधारण की समस्याओं और संघर्षों से जुड़ी है। शिक्षार्थी उनके कृतित्व का रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO6. हरीशचन्द्र पांडे समकालीन हिन्दी कविता में नब्बे के दशक के प्रमुख कवि हैं। देश में उदारवाद, भूमंडलीकरण और विभिन्न सामाजिक परिवर्तनों के बीच बदलते हुए जीवन और समाज के प्रसंग उनकी कविता का विषय हैं। शिक्षार्थी उनके कृतित्व का रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO7. शिक्षार्थी समकालीन हिन्दी कविता की समीक्षा का रचनात्मक ज्ञान व प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम :

1. गुमानी
2. चंद्रकुंवर बर्वाल
3. लीलाधर जगूड़ी
4. मंगलेश डबराल
5. वीरेन डंगवाल
6. हरीशचंद्र पाण्डेय

व्याख्या हेतु निर्धारित पाठ्यपुस्तक:

उत्तराखण्ड के हिंदी कवि - संपा० प्रो० दिवा भट्ट

अथवा

XIII (ग)

त्रयोदश प्रश्नपत्र (ग) - उत्तराखण्ड के हिंदी कथाकार (चतुर्थ सत्र)

- CO1. हिन्दी के प्रेमचंदोत्तर कथा साहित्य में उत्तराखंड राज्य के कथाकारों का अत्यन्त महत्वपूर्ण योगदान व स्थान है। शिक्षार्थी इस परम्परा और उसमें उत्तराखंड के कथाकारों के समग्र योगदान और महत्व का ऐतिहासिक परिचय प्राप्त करता है।
- CO2. शिक्षार्थी हिन्दी के उपन्यास साहित्य में उत्तराखंड के उपन्यासकारों के कृतित्व का परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी पाठ्यक्रम में सम्मिलित उपन्यास कसप के अध्ययन से हिन्दी साहित्य में विकसित हो रहे नवीन उत्तरआधुनिक कथ्य (स्थानीय-आंचलिक एवं मुक्त-ग्लोबल) एवं शिल्प का परिचय तथा उसका सैद्धान्तिक आलोचनात्मक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी पाठ्यक्रम में सम्मिलित उपन्यास गोबर गणेश के अध्ययन से उत्तराखंड के कुमाउनी अंचल के लोक जीवन का परिचय तथा बदलते जीवनमूल्यों व सामाजिक संरचनाओं का सैद्धान्तिक आलोचनात्मक प्राप्त करता है।
- CO5. शिक्षार्थी पाठ्यक्रम में सम्मिलित कहानियों के अध्ययन से हिन्दी कहानी तथा उसके प्रमुख आंदोलनों अथवा प्रवृत्तियों(मनोवैज्ञानिक कहानी, नयी कहानी, प्रगतिशील कहानी, अकहानी, आंचलिक अकहानी आदि) में उत्तराखंड के कहानीकारों के महत्वपूर्ण रचनात्मक योगदान का परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी कथा साहित्य की समीक्षा का ज्ञान और प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम :

(क) उपन्यासकार:

1. मनोहरश्याम जोशी: कसप (व्याख्या हेतु), राजकमल प्रकाशन, नई दिल्ली।
2. रमेशचंद्र शाह: गोबर गणेश (व्याख्या हेतु), राजकमल प्रकाशन, नई दिल्ली।

(ख) कहानी-संग्रह:

3. पाँच कहानियाँ (1. दुष्कर्मी- इलाचन्द्र जोशी, 2. रज्जो- रमाप्रसाद धिल्लियाल 'पहाड़ी',
3. हलवाहा- शेखर जोशी, 4. बीच की दरार- गंगाप्रसाद 'विमल', 5. अ-रचित- दिवा भट्ट)- संपा० डा. जगतसिंह बिष्ट, प्रकाश प्रकाशन, चौघानपाटा, अल्मोड़ा।

XIV (क)

चतुर्दश प्रश्नपत्र - (क) लोक साहित्य (चतुर्थ सत्र)

- CO1. किसी भी समाज और राष्ट्र की एक मूल लोक परम्परा होती है, जिससे उस राष्ट्र और समाज के समग्र सामाजिक चरित्र का निर्माण होता है। वैश्विक स्तर पर लोक साहित्य के अध्ययन एवं शोध को महत्वपूर्ण माना गया है तथा विश्वविद्यालयों में इसके पृथक विभाग स्थापित किए गए हैं। लोक साहित्य के अध्ययन से शिक्षार्थी इस मूल लोक परम्परा के अर्थ, स्वरूप और महत्व का परिचय एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी लोक संस्कृति और लोक साहित्य के विविध सैद्धान्तिक पक्षों का ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी अभिजात साहित्य और लोक साहित्य के अंतर्सम्बन्धों का परिचय व ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी लोक साहित्य की अध्ययन प्रक्रिया(संकलन तथा पाठ निर्धारण) का ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO5. शिक्षार्थी लोक साहित्य के विविध रूपों का परिचय एवं ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी लोक साहित्य के शोध का ज्ञान एवं प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम :

1. लोक और लोक-वार्ता, लोक-विज्ञान।
2. लोक संस्कृति और साहित्य
3. लोक साहित्य का स्वरूप
4. अभिजात साहित्य और लोक साहित्य का अंतःसंबंध।
5. लोक साहित्य की अध्ययन-प्रक्रिया एवं संकलन की समस्याएँ।
6. लोक साहित्य के प्रमुख रूपों का वर्गीकरण: लोकगीत, लोककथा, लोकगाथा, लोकनाट्य, कहावतें, मुहावरे, पहेलियाँ, लोक संगीत।

अथवा

XIV(ख)

चतुर्दश प्रश्नपत्र - (ख) कुमाउनी लोक साहित्य (चतुर्थ सत्र)

- CO1. भाषा और साहित्य की नयी उत्तरसंरचनावादी पद्धति में लोक साहित्य के अध्ययन का महत्व बढ़ा है। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी कुमाउनी लोक-साहित्य का रचनात्मक परिचय एवं सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी इस पाठ्यक्रम के अध्ययन से कुमाउनी लोक गीतों के स्वरूप, विषयवस्तु एवं प्रकार का रचनात्मक परिचय एवं ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी इस पाठ्यक्रम के अध्ययन से कुमाउनी लोक साहित्य के विविध रूपों का रचनात्मक परिचय एवं ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी इस पाठ्यक्रम के अध्ययन से कुमाउनी लोक गीतों के स्वरूप, विषयवस्तु एवं

प्रकार का रचनात्मक परिचय एवं ज्ञान प्राप्त करता है।

CO5. शिक्षार्थी इस पाठ्यक्रम के अध्ययन से कुमाउनी लोक कथाओं के स्वरूप, विषयवस्तु एवं प्रकार का रचनात्मक परिचय एवं ज्ञान प्राप्त करता है।

CO6. शिक्षार्थी इस पाठ्यक्रम के अध्ययन से उत्तराखंड लोक सेवा आयोग की प्रतियोगी परीक्षाओं हेतु कुमाउनी लोक साहित्य का विशिष्ट ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

1. सं० देवसिंह पोखरिया: न्यौली सतसई, (व्याख्या हेतु प्रारंभ के 300 छंद), कंसल बुक डिपो, नैनीताल।
2. सं० देवसिंह पोखरिया: कुमाउनी लोक साहित्य, (व्याख्या हेतु न्यौली को छोड़कर सभी लोकगीत) - मध्यप्रदेश आदिवासी लोककला परिषद्, भोपाल।
3. डा. प्रयाग जोशी: कुमाउनी लोक गाथाएँ (प्रथम भाग) (व्याख्या हेतु प्रारंभ की 6 लोकगाथाएँ), किशोर एण्ड संस, देहरादून।
4. डा. प्रभा पंत: कुमाउनी लोककथा (व्याख्या हेतु प्रारंभ की 10 लोककथाएँ), अल्मोड़ा बुक डिपो, अल्मोड़ा।
5. डा. कृष्णानंद जोशी: कुमाऊँ का लोक साहित्य, (व्याख्या हेतु केवल धार्मिक गीत), प्रकाश बुक डिपो, बरेली।

अथवा

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चतुर्दश प्रश्नपत्र - (ग) भारतीय साहित्य (चतुर्थ सत्र)

- CO1. शिक्षार्थी भारतीयता की मूल भावना, भारतीय मूल्यों की अभिव्यक्ति तथा समाजशास्त्र से परिचित होता है।
- CO2. शिक्षार्थी अन्य भारतीय भाषाओं के साहित्य के हिन्दी अनुवाद और अध्ययन की समस्याओं से परिचित होता है।
- CO3. शिक्षार्थी भारतीय साहित्य के समग्र स्वरूप और महत्व का परिचय व ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी भारत के दक्षिणी भाषा वर्ग(मलयालम, तमिल, तेलगु व कन्नड़), पूर्वी भाषा वर्ग(उड़िया, बंगला, असमिया व मणिपुरी) तथा पश्चिमोत्तर भाषा वर्ग(मराठी, गुजराती, पंजाबी, कश्मीरी व उर्दू) के साहित्य का सामान्य परिचय व ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी पाठ्यक्रम में सम्मिलित अनूदित पुस्तकों के अध्ययन से भारतीय साहित्य का रचनात्मक परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी भारतीय साहित्य के अध्ययन से जनसाधारण के स्तर पर राष्ट्र की एकता, सम्पूर्णता, विराटता व अखंडता का साक्षात्कार करता है।

CO7. शिक्षार्थी में राष्ट्रगौरव और राष्ट्रप्रेम की भावना का विकास होता है

निर्धारित पाठ्यक्रम:

प्रथम खंड:

1. भारतीय साहित्य का स्वरूप
2. भारतीय साहित्य के अध्ययन की समस्याएँ
3. भारतीय साहित्य में आज के भारत का बिंब
4. भारतीयता का समाजशास्त्र
5. हिंदी साहित्य में भारतीय मूल्यों की अभिव्यक्ति।

द्वितीय खंड:

1. दाक्षिणात्य भाषा वर्ग: मलयालम, तमिल, तेलुगु, कन्नड़।
2. पूर्वांचल भाषा वर्ग: उड़िया, बँगला, असमिया, मणिपुरी।
3. पश्चिमोत्तर भाषा वर्ग: मराठी, गुजराती, पंजाबी, कश्मीरी, उर्दू।

तृतीय खंड - पाठ्यपुस्तकें:

1. अग्निगर्भ (बंगला)- महाश्वेता देवी
 2. कोच्चिन के दरख्त (मलयालम)- के०जी० शंकरपिल्लै
 3. घासीराम कोतवाल (मराठी)- विजय तेंदुलकर
 4. जसमा ओड़न (गुजराती)- शांता गाँधी
- (नोट: उक्त पुस्तकों से मात्र आलोचनात्मक प्रश्न पूछे जाएँगे।)

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पंचदश प्रश्नपत्र - (क) विशिष्ट अध्ययन: प्रेमचंद(चतुर्थ सत्र)

CO1. प्रेमचंद आधुनिक हिन्दी साहित्य के निर्माताओं में अग्रणी हैं। उनके उपन्यासों और कहानियों ने हिन्दी में कथा साहित्य को एक स्थायी एवं सशक्त आधार प्रदान किया है। आज भी उनकी परम्परा में कथा लेखन होता है। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी हिन्दी कथा साहित्य की परम्परा और उसमें प्रेमचंद के योगदान एवं महत्व का ऐतिहासिक परिचय प्राप्त करता है।

CO2. रंगभूमि उपन्यास स्वतंत्रतापूर्व के भारत की बदल रही राजनीतिक-आर्थिक स्थितियों और सामाजिक जीवनमूल्यों के बीच सम्बन्धों की कथा कहता है। अत्यन्त वंचित और विपन्न अंधे भिखारी को नायक बनाने वाले इस उपन्यास के अध्ययन से शिक्षार्थी उन आर्थिक दिशाओं और सामाजिक स्थितियों का परिचय और ज्ञान प्राप्त करता है, जिन्होंने स्वतंत्रता पश्चात देश का सामना होना था।

CO3. शिक्षार्थी प्रेमचंद के उपन्यासों के शिल्प का परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी कुछ विचार नामक संग्रह में संकलित प्रेमचंद के निबंधों के अध्ययन से उनके

राजनीति, आर्थिक और सामाजिक विचारों का परिचय और ज्ञान प्राप्त करता है।

CO5. प्रेमचंद जन साधारण के जीवन के कहानीकार हैं। मानसरोवर भाग 1 के अध्ययन से शिक्षार्थी प्रेमचंद की कहानियों की अन्तर्वस्तु और शिल्प का परिचय प्राप्त करता है।

CO6. शिक्षार्थी प्रेमचंद के साहित्य पर विशेषज्ञता प्राप्त करता है, जो परवर्ती उच्चस्तरीय शोधादि कार्यों में सहायक होती है।

निर्धारित पाठ्यक्रम:

1. रंगभूमि

2. कुछ विचार

3. मानसरोवर भाग -1

(टिप्पणी: प्रेमचंद का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तकों का संदर्भ केवल व्याख्या के लिए है।)

अथवा

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पंचदश प्रश्नपत्र - (ख) विशिष्ट अध्ययन: आचार्य रामचंद्र शुक्ल (चतुर्थ सत्र)

CO1. शिक्षार्थी हिन्दी आलोचना के उद्भव एवं विकास का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।

CO2. शिक्षार्थी आचार्य शुक्ल के निबंधों के अध्ययन से हिन्दी निबंध के विकास का परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।

CO3. शिक्षार्थी रामचंद्र शुक्ल ग्रंथावली के अध्ययन से साहित्य पर विचार एवं मूल्यांकन की भारतीय और पश्चिमी पद्धतियों का तुलनात्मक ज्ञान प्राप्त करता है।

CO4. शिक्षार्थी वैचारिक तथा मनोवैज्ञानिक निबंधों के उत्कर्ष का साक्षात्कार करता है, जिससे उसे सामाजिक तथा मनोवैज्ञानिक संदर्भों में साहित्य के आकलन की आधुनिक दृष्टि प्राप्त होती है।

CO5. शिक्षार्थी हिन्दी साहित्य के इतिहास तथा जायसी, तुलसी, सूर आदि कवियों के अध्ययन की नवीन दृष्टि प्राप्त करता है।

CO6. शिक्षार्थी भारतीय काव्यशास्त्र की मौलिक एवं नवीन व्याख्या तथा सैद्धान्तिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम :

रामचंद्र शुक्ल ग्रंथावली: (व्याख्या हेतु ग्रंथावली का केवल निबंध भाग)

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पंचदश प्रश्नपत्र - (ग) विशिष्ट अध्ययन: कबीरदास (चतुर्थ सत्र)

- CO1. विश्व की प्राचीन कविता परम्परा में भारत की भक्तिकालीन निर्गुण धारा के कवि कबीर का महत्वपूर्ण स्थान है। विश्व भर में उन पर शोधकार्य हुए हैं। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी कबीर की कविता एवं दर्शन का रचनात्मक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी कबीर के अध्ययन से भक्ति आंदोलन, संत परम्परा तथा निर्गुण काव्यधारा का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी कबीर के अध्ययन से मध्यकालीन भारतीय समाज तथा उसमें उपस्थित जाति-धर्म, अज्ञान, अंधविश्वास आदि के विरुद्ध प्रतिरोध का रचनात्मक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी कविता के दार्शनिक पक्ष का परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी कविता के सामाजिक पक्ष का परिचय व सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी साहित्य की समग्र आध्यात्मिक एवं सामाजिक समीक्षा का ज्ञान व प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम:

कबीर ग्रंथावली - संपा0 श्यामसुंदर दास: (व्याख्या हेतु साखी भाग और आंरभिक 100 पद) टिप्पणी: कबीरदास का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तक से व्याख्या पूछी जाएगी।

अथवा

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पंचदश प्रश्नपत्र - (घ) विशिष्ट अध्ययन: सूरदास (चतुर्थ सत्र)

- CO1. शिक्षार्थी हिन्दी साहित्य के भक्तिकाल का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी भारतीय दर्शन में ईश्वर के स्वरूप पर हुई मीमांसा का ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी भारतीय अध्यात्म एवं भक्ति में ज्ञानयोग की निर्गुणधारा और प्रेम माधुर्य की सगुणोपासना के विमर्श का ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी लोक और प्रकृति के कार्य-व्यवहार का रचनात्मक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी ईश्वर की लौकिकता और उससे सम्भव हुई संसार और समाज की शुभ्रता का रचनात्मक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी उच्च जीवन मूल्यों तथा नैतिकता का ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

सूरसागर सार - संपा0 धीरेन्द्र वर्मा:

टिप्पणी: सूरदास का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तक से व्याख्या पूछी

जाएगी।

अथवा

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पंचदश प्रश्नपत्र - (ड) विशिष्ट अध्ययन: सुमित्रानंदन पंत (चतुर्थ सत्र)

- CO1. छायावाद आधुनिक हिन्दी कविता की प्रथम युग प्रवृत्ति है, जिसने आगे की कविता का आधार रचा। सुमित्रानंदन पंत इस काव्यधारा के प्रमुख कवि हैं। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी आधुनिक हिन्दी कविता और छायावाद का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी सुमित्रानंदन पंत के कृतित्व का रचनात्मक परिचय व आलोचनात्मक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी कविता और प्रकृति के चिरसम्बंधों का रचनात्मक तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी सुमित्रानंदन पंत के काव्य के अध्ययन से प्रगतिवाद का आरम्भिक परिचय प्राप्त करता है।
- CO5. शिक्षार्थी आधुनिक काव्यकला में पाश्चात्य तथा भारतीय नवोन्मेष का रचनात्मक परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

चिदम्बरा - सुमित्रानंदन पंत, राजकमल प्रकाशन, नई दिल्ली
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तारापथ- सुमित्रानंदन पंत, लोकभारती प्रकाशन, इलाहाबाद।

टिप्पणी: सुमित्रानंदन पंत का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तक से व्याख्या पूछी जाएगी।

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पंचदश प्रश्नपत्र - (च) विशिष्ट युग प्रवृत्ति का अध्ययन (छायावाद)

- CO1. उन्नीसवीं शताब्दी के पूर्वार्द्ध में छायावाद हिन्दी कविता का अत्यन्त महत्वपूर्ण कालखंड तथा काव्यान्दोलन है। छायावाद का हिन्दी कविता के इतिहास में वही स्थान है, जो अंग्रेजी कविता के इतिहास में Romanticism अर्थात् स्वच्छंदतावाद का। शिक्षार्थी इस पाठ्यक्रम के अध्ययन से हिन्दी कविता की इस महत्वपूर्ण युग प्रवृत्ति छायावाद का ऐतिहासिक परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।

- CO2. शिक्षार्थी माखनलाल चतुर्वेदी, रामकुमार वर्मा तथा मुकुटधर पाण्डेय के कृतित्व का युगीन परिचय तथा आलोचनात्मक ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी छायावाद के कीर्तिस्तम्भ जयशंकर प्रसाद के काव्य का युगीन रचनात्मक परिचय तथा आलोचनात्मक सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO4. शिक्षार्थी छायावाद के कीर्तिस्तम्भ सुमित्रानंदन पंत के काव्य का युगीन रचनात्मक परिचय तथा आलोचनात्मक सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO5. शिक्षार्थी छायावाद के कीर्तिस्तम्भ सूर्यकांत त्रिपाठी निराला के काव्य का युगीन रचनात्मक परिचय तथा आलोचनात्मक सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO6. शिक्षार्थी छायावाद की कीर्तिस्तम्भ महादेवी वर्मा के काव्य का युगीन रचनात्मक परिचय तथा आलोचनात्मक सैद्धान्तिक ज्ञान प्राप्त करता है।

निर्धारित पाठ्यक्रम:

- माखनलाल चतुर्वेदी: आधुनिक कवि: प्रारंभिक 10 कविताएँ
 रामकुमार वर्मा: प्रारंभिक 10 कविताएँ
 मुकुटधर पाण्डेय: कश्मीर सुषमा
 जयशंकर प्रसाद: लहर (अंतिम 3 कविताएँ)
 सुमित्रानंदन पंत: पल्लविनी (प्रारंभिक 10 कविताएँ)
 निराला: अपरा: (प्रारंभ की 10 कविताएँ)
 महादेवी वर्मा: यामा: (आरंभिक 10 गीत)

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पंचदश प्रश्नपत्र - (छ) हिन्दी पत्रकारिता

- CO1. पत्रकारिता रोज़गार का एक महत्वपूर्ण क्षेत्र है, जिसका विस्तार बढ़ता जा रहा है। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी पत्रकारिता का मूलभूत ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO2. शिक्षार्थी विश्व तथा हिन्दी पत्रकारिता का ऐतिहासिक परिचय प्राप्त करता है।
- CO3. शिक्षार्थी हिन्दी में पत्रकारिता के मूल तत्वों तथा प्रकारों का तकनीकी ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO4. शिक्षार्थी समाचार-संकलन तथा सम्पादन कला के समस्त पक्षों का ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- CO5. शिक्षार्थी पत्रकारिता से सम्बन्धित लेखन यथा सम्पादकीय, फीचर, रिपोर्टाज, साक्षात्कार, खोजी समाचार, अनुवर्तन, दृश्य सामग्री आदि का ज्ञान एवं प्रशिक्षण प्राप्त करता है।

- CO6. शिक्षार्थी इलेक्ट्रॉनिक मीडिया तथा मुद्रण कला का ज्ञान प्राप्त करता है।
- CO7. शिक्षार्थी भारतीय संविधान, प्रेस कानून तथा पत्रकारिता की आचार संहिता का ज्ञान प्राप्त करता है।
- CO8. समग्रता में शिक्षार्थी पत्रकार बनने की प्रेरणा, आधारभूत ज्ञान तथा प्रशिक्षण प्राप्त करता है।

निर्धारित पाठ्यक्रम :

1. पत्रकारिता का स्वरूप और प्रमुख प्रकार।
2. विश्व पत्रकारिता का उदय, भारत में पत्रकारिता का आरंभ।
3. हिंदी पत्रकारिता का उद्भव और विकास।
4. समाचार पत्रकारिता के मूल तत्व- समाचार संकलन तथा लेखन के मुख्य आयाम।
5. संपादन कला के सामान्य सिद्धांत- शीर्षकीकरण, पृष्ठ-विन्यास, आमुख और समाचारपत्र की प्रस्तुति-प्रक्रिया।
6. समाचार पत्रों के विभिन्न स्तंभों की योजना।
7. दृश्य सामग्री (कार्टून, रेखाचित्र, ग्राफिक्स) की व्यवस्था और फोटो पत्रकारिता।
8. समाचार के विभिन्न स्रोत।
9. संवाददाता की अर्हता, श्रेणी एवं कार्यपद्धति।
10. पत्रकारिता से संबंधित लेखन: संपादकीय, फीचर, रिपोर्टाज, साक्षात्कार, खोजी समाचार, अनुवर्तन (फालोअप) आदि की प्रविधि।
11. इलेक्ट्रॉनिक मीडिया की पत्रकारिता: रेडियो, टी0वी0, वीडियो, केबल, मल्टी मीडिया और इंटरनेट की पत्रकारिता।
12. प्रिंट पत्रकारिता और मुद्रणकला, प्रूफ शोधन, ले आउट तथा पृष्ठ-सज्जा।
13. पत्रकारिता का प्रबंधन- प्रशासनिक व्यवस्था, बिक्री तथा वितरण व्यवस्था।
14. भारतीय संविधान में प्रदत्त मौलिक अधिकार, सूचनाधिकार एवं मानवाधिकार।
15. मुक्त प्रेस की अवधारणा।
16. लोक-संपर्क तथा विज्ञापन।
17. प्रसार भारती तथा सूचना प्रौद्योगिकी।
18. प्रेस संबंधी प्रमुख कानून तथा आचार संहिता।
19. प्रजातंत्रिक व्यवस्था में चतुर्थ स्तंभ के रूप में पत्रकारिता का दायित्व।

अथवा

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पंचदश प्रश्नपत्र - (ज) अनुवाद : सिद्धान्त एवं प्रयोग

- CO1. अनुवाद दो भाषाओं के बीच कार्य-व्यवहार को सुगम बनाता है। शिक्षार्थी इस पाठ्यक्रम के अध्ययन से अनुवाद प्रक्रिया का समग्र परिचय तथा सैद्धान्तिक ज्ञान प्राप्त करता है।
- CO2. शिक्षार्थी अनुवाद के स्वरूप, विभिन्न क्षेत्रों तथा सीमाओं का ज्ञान प्राप्त करता है।
- CO3. शिक्षार्थी अनुवाद प्रक्रिया के विभिन्न चरण और प्रविधि यथा विश्लेषण, अर्थान्तरण, पुनर्गठन, सम्प्रेषण आदि का ज्ञान व प्रशिक्षण प्राप्त करता है।
- CO4. शिक्षार्थी समतुल्यता के सिद्धान्त का परिचय तथा अनुवाद के विभिन्न प्रकारों/क्षेत्रों यथा साहित्यिक, कार्यालयी, मानविकी, संचार माध्यमों, वैज्ञानिक एवं तकनीकी इत्यादि का ज्ञान व प्रशिक्षण प्राप्त करता है।
- CO5. शिक्षार्थी अनुवाद की समस्याओं का विस्तृत परिचय प्राप्त करते हुए अनुवाद का व्यावहारिक प्रशिक्षण प्राप्त करता है।
- CO6. नयी वैश्विक परिस्थितियों एवं भूमंडलीकृत संसार में संचार, संवाद एवं सम्प्रेषण के सरकारी और गैरसरकारी क्षेत्रों में रोजगार के नए और समृद्ध अवसर उपस्थित हुए हैं। इस पाठ्यक्रम के अध्ययन से शिक्षार्थी समग्रता में इन अवसरों का लाभ उठाने की मूलभूत योग्यता और विशेषज्ञता अर्जित करता है।

निर्धारित पाठ्यक्रम :

1. अनुवाद: परिभाषा, क्षेत्र और सीमाएँ।
2. अनुवाद का स्वरूप: अनुवाद कला, विज्ञान अथवा शिल्प।
3. अनुवाद की इकाई: शब्द, पदबंध, वाक्य, पाठ।
4. अनुवाद की प्रक्रिया और प्रविधि: विश्लेषण, अर्थान्तरण, पुनर्गठन। अनुवाद-प्रक्रिया के विभिन्न चरण, स्रोत भाषा के पाठ का विश्लेषण एवं उसके अर्थग्रहण की प्रक्रिया, स्रोतभाषा और लक्ष्य भाषा की तुलना तथा अर्थान्तरण की प्रक्रिया। अनूदित पाठ का पुनर्गठन और अर्थ-संप्रेषण की प्रक्रिया। अनुवाद-प्रक्रिया की प्रकृति।
5. अनुवाद तथा समतुल्यता का सिद्धांत।
6. अनुवाद के क्षेत्र एवं प्रकार: कार्यालयी, वैज्ञानिक एवं तकनीकी, साहित्यिक, मानविकी, संचारमाध्यम, विज्ञापन आदि।
7. अनुवाद की समस्याएँ: सुजनात्मक अथवा साहित्यिक अनुवाद की समस्याएँ, कार्यालयी अनुवाद की समस्याएँ, वैज्ञानिक एवं तकनीकी साहित्य के अनुवाद की समस्याएँ, विधि-साहित्य के अनुवाद की समस्याएँ, कोश एवं पारिभाषिक शब्दार्थ के निर्माण की समस्याएँ, मीडिया क्षेत्र के अनुवाद की समस्याएँ, विज्ञापन के अनुवाद की समस्याएँ।
8. अनुवाद के उपकरण: कोश, पारिभाषिक शब्दावली, थिसारस, कम्प्यूटर आदि।
9. अनुवाद: पुनरीक्षण, संपादन, मूल्यांकन।

10. मशीनी अनुवाद ।
11. अनुवाद की सार्थकता, प्रासंगिकता एवं व्यावसायिक परिदृश्य ।
12. अनुवादक के गुण ।
13. पाठ की अवधारणा और प्रकृति: पाठ शब्द, प्रति शब्द।शाब्दिक अनुवाद, भावानुवाद, छायानुवाद, पूर्ण और आंशिक अनुवाद, आशु अनुवाद ।
14. व्यावहारिक अनुवाद: प्रश्नपत्र में दिए गए अंग्रेजी अवतरण का हिंदी अनुवाद ।

अथवा

XV (Dissertation)

लघु शोधप्रबंध

- CO1. शिक्षार्थी शोध के अर्थ, स्वरूप और महत्व का ज्ञान प्राप्त करता है ।
- CO2. शिक्षार्थी भाषा और साहित्य की शोध प्रविधि का ज्ञान व प्रशिक्षण प्राप्त करता है ।
- CO3. शिक्षार्थी शोध प्रक्रिया का व्यावहारिक ज्ञान व प्रशिक्षण प्राप्त करता है ।
- CO4. शिक्षार्थी शोध प्रबंध के लेखन का ज्ञान व प्रशिक्षण प्राप्त करता है ।
- CO5. शिक्षार्थी शोध के अकादमिक तथा सामाजिक उद्देश्य तथा महत्व का परिचय प्राप्त करता है ।

टिप्पणी: जिन संस्थागत विद्यार्थियों ने स्नातकोत्तर प्रथम, द्वितीय एवं तृतीय सत्रार्थ (हिंदी) की परीक्षा में कुल मिलाकर 55 प्रतिशत या उससे अधिक अंक प्राप्त किए हों, वे पंचदश प्रश्नपत्र के विकल्प में विभागाध्यक्ष द्वारा निर्दिष्ट विभागीय प्राध्यापक के निर्देशन में लघु-शोध प्रबंध प्रस्तुत करते हैं, जिसका मूल्यांकन निर्देशक तथा बाह्य परीक्षक द्वारा किया जाता है ।

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(Viva Voice) मौखिकी

- CO1. शिक्षार्थी समस्त पाठ्यक्रम का पुनरावलोकन करता है ।
- CO2. शिक्षार्थी पुस्तकों द्वारा प्राप्त ज्ञान को व्यावहारिक रूप में अभिव्यक्त करने का प्रशिक्षण प्राप्त करता है ।
- CO3. शिक्षार्थी विषय का अध्ययन करते हुए आत्मसात किए गए ज्ञान की अभिव्यक्ति का अवसर प्राप्त करता है ।
- CO4. शिक्षार्थी विषय को लेकर अपनी मौलिक दृष्टि की अभिव्यक्ति का अवसर प्राप्त करता है ।
- CO5. शिक्षार्थी प्रतियोगी परीक्षाओं के लिए साक्षात्कार का अभ्यास व प्रशिक्षण प्राप्त करता है ।

टिप्पणी: लिखित परीक्षा की समाप्ति के पश्चात् मौखिक परीक्षा संपन्न होती है ।

शोध (पी-एच.डी. हिन्दी)

- PO1. शोधार्थी पूर्ण अकादमिक तथा शैक्षिक सुविधाओं के साथ उच्चस्तरीय शोध का अवसर प्राप्त करता है।
- PO2. शोधार्थी शोध की प्रविधि का ज्ञान एवं प्रशिक्षण प्राप्त करता है।
- PO3. शोधार्थी साहित्येतिहास तथा ऐतिहासिक पुनर्लेखन का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO4. शोधार्थी व्याख्यात्मक शोध यथा मनोवैज्ञानिक, प्रवृत्तिपरक, सांस्कृतिक, सामाजिक, साहित्यशास्त्रीय शोध का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO5. शोधार्थी क्षेत्रीय भाषाओं और साहित्य के शोध का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO6. शोधार्थी लोकतात्विक शोध का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO7. शोधार्थी भाषातात्विक शोध का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO8. शोधार्थी तुलनात्मक शोध का सैद्धान्तिक एवं व्यावहारिक ज्ञान प्राप्त करता है।
- PO9. शोधार्थी अपने क्षेत्र, समाज एवं राष्ट्र के हित में उद्देश्यपूर्ण शोध का ज्ञान, अनुभव एवं प्रशिक्षण प्राप्त करता है।

Criterion I – Curricular Aspects (150)

Key Indicator – 1.1 Curriculum Design and Development (50)

Metric No.		Weightage
1.1.1 QM	<p><i>Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific Outcomes(PSOs) and Course Outcomes(COs) of the Programmes offered by the University</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload Additional information • Link for Additional information 	20
	<p>Information Technology as a subject at UG and PG level is being taught in the department to prepare students to present themselves effectively in a dynamic technological era.</p> <p>To promote the understanding and application of ICT-related skills for immediate application to other curricular areas.</p> <p>To enable to have sound knowledge of the theory and practical behind the core subjects like computer architecture, operating systems, data structures, data bases, computer networks.</p> <p>To equip to possess sound skills in selected procedural and object oriented programming languages, designing databases and managing them, software engineering and web-based applications and understanding of cloud computing.</p> <p>To facilitate the development and application of problem-solving skills in students.</p> <p>And after all to make students socially responsible citizens.</p> <p>Programme Educational Objectives</p> <ul style="list-style-type: none"> • The graduates will become successful professional by demonstrating logical and analytical thinking abilities in the field of IT. • The graduates will work and communicate effectively in interdisciplinary environment, either independently or in team, and demonstrate scientific leadership in academia and industry. • The graduates will engage in lifelong learning and professional development through advanced degrees in information technology, discussion, professional studies and research. <p>Programme specific outcome</p> <ul style="list-style-type: none"> • The students will be able to work effectively as a part of a team to achieve a common stated goal. • They will be able to communicate effectively with a range of audiences both technical and non-technical. • They will be able to develop an aptitude to engage in continuing professional development. 	

	<ul style="list-style-type: none"> • The students will be ready for the jobs available in different fields like: <ul style="list-style-type: none"> <input type="checkbox"/> Software Development (Programming) <input type="checkbox"/> Website Development <input type="checkbox"/> Software Testing <input type="checkbox"/> Networking <input type="checkbox"/> Database Administration <input type="checkbox"/> System Administration <input type="checkbox"/> Cyber Law Consultant <input type="checkbox"/> IT Service Desk <input type="checkbox"/> Security 	
<p>1.1.2</p> <p>QnM</p>	<p><i>Percentage of Programmes where syllabus revision was carried out during the last five years</i></p> <p>1.1.2.1: How many Programmes were revised out of total number of Programmes offered during the last five years</p> <p>1.1.2.2 : Number of all Programmes offered by the institution during the last five years</p> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Programme Code • Names of the Programme revised <p>Formula:</p> $\frac{\text{Number of Programmes in which syllabus was revised during the last five years}}{\text{Number of Programmes offered by the institution during the last five years}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Minutes of relevant Academic Council/BOS meeting • Any additional information • Details of Programme syllabus revision in last 5 years (Data Template) 	<p>20</p>
	<p>1. Syllabus was upgraded at UG and PG PGDCA and BIT courses in the year 2019</p>	

Minutes of the meeting of B.O.S. 2019 at Information Technology Department

A meeting of BOS for Department of Information Technology was held at Kumaun University, Administrative block, Nainital on 02-02-2019. The following members are present:

1. Ms. Umang (Convener)
Department of Information Technology
SSJ Campus Almora
2. Prof. DK Lohiyal
Dean School of Computer & Systems Sciences
J.N.U., New Delhi
3. Prof Omega Bishr
Dean Science
Kumaun University, Nainital
4. Prof. MC Joshi
Dept. of Mathematics
DSS Campus

The following items were discussed and approved-

1. Ongoing syllabus in UG and PG Degree courses 2016 onwards.
2. The syllabus of BIT to be applicable from new upcoming session 2019.
3. The syllabus of MIT from new upcoming session 2019.
4. Adoption of new professional level finance program ordinances 2018.
5. Panel of examiners for UG/PG/PGDCA and BIT (Convener is authorized to make any changes in the panel).
6. The syllabus of PGDCA semester system (02 semesters).


DM
02/02/19
(Prof. D. K. Lohiyal)

Omega Bishr
02/02/19
(Prof. Omega Bishr)

Umang
02/02/19

MC Joshi
02/02/19

2. UG syllabus was revised in 2019 to implement two subjects at UG level.

 **कुमाऊँ विश्वविद्यालय, नैनीताल ।**
KUMAUN UNIVERSITY, NAINITAL (UTTARAKHAND)

पत्रांक: संय/साम्बल/ 2019/52 दिनांक: 17-4/2-19

सेवा में
श्री 0 उभय
विभागध्यक्ष
सूचना प्रौद्योगिकी विभाग
एस.एस.जे. परिसर, नैनीताल ।

विषय - सूचना प्रौद्योगिकी पाठ्यसमिति की बैठक के सम्बन्ध में ।

महोदय,
आपके पत्र दिनांक 01. 04. 2019 के ज्ञान में माननीय कुमाऊँ विश्वविद्यालय की के आदेश दिनांक 08. 04. 2019 के द्वारा आपसे यह कहने का निर्देश प्राप्त हुआ है कि सूचना प्रौद्योगिकी विभाग पाठ्यसमिति की बैठक दिनांक 15. 04. 2019 से पूर्व अनिवार्य रूप से करायी जानी होगी। बैठक कीटिपो कॉन्फ्रेंसिंग या स्कैप के द्वारा भी करायी जा सकती है एवं बैठक का कार्यपत्र कुमोदन के लिए ई-मेल द्वारा भेजा जा सकता है।
कृपया सूचना प्रौद्योगिकी विभाग पाठ्यसमिति की बैठक दिनांक 15. 04. 2019 से पूर्व कराये जाने की कार्यवाही सुनिश्चित करने का कष्ट करें।

नमस्ते
[Signature]

← Re: thanks and remuneration for...

[Sent from Yahoo Mail on Android](#)

On Fri, 12 Apr 2019 at 6:10 pm, Kishori Lal Bansal

<kishorilalbansal@yahoo.co.in> wrote:

Madam

I hav gone through the agenda and approved
.pls go ahead.

Thanks

Dr k l Bansal
Professor & Head
Computer science Department
H P University Shimla
09418915009

[Sent from Yahoo Mail for iPhone](#)

Show more

← Fw: Agenda for BOS meeting-reg

University -amirkumar@gmail.com

Cc:

Sent: Thu, 11 Apr 2019 at 12:38 am

Subject: Agenda for BOS meeting-reg

Respected Sir/Madam,

As per University Letter No.KU/Manyata/2019/52 dated 10-04-2019, I have been directed to conduct Board Of Studies meeting for Department of Information Technology, Kumaun University, Nainital via email circulation/video conferencing via skype (letter attached) must before 15 April 2019.

The following items are to be discussed and approved-

1. Syllabus for two papers per semester for BA/B Sc and one paper for B Com from upcoming session to be commenced from July 2019.

2. The ongoing syllabus (2015-16) of B Sc vocational course in Desktop Publishing (by ministry of ITes under Deen Dayal Upadhyay Kaushal Kendra).

Kindly give your suggestions regarding the proposed syllabus for BA/B Sc/B Com, so that it can be approved.

Please find attached the office order copy and proposed syllabus for UG and BVoc

Desktop Publishing course.

Thanks and regards,

3. Annual system syllabus at UG level was revised in 2019.

Minutes of the meeting of B.O.S. 2019 of Information Technology Department

A meeting of BOS for Department of Information Technology was held at Kumaun University Administrative block, Nainital on 30-11-2019. The following members are present:

1. Ms. Umang (Convener)
Department of Information Technology
SSJ Campus Almora
2. Prof. Ravindra Singh
Department of CS&IT MJRP, Ruhelkhand University
Barcilly
3. Prof. SPS Mehta
Dean Science
Kumaun University, Nainital

Umang
30/11/19

Ravindra Singh
30/11/19

SPS Mehta
30/11/2019

The following items were discussed and approved-

1. Annual mode syllabus for BA/B Sc /B Com Information Technology.
2. Panel of examiners (Convener is authorized to make changes in the Panel as per need).

Umang
Umang
Umang
30/11/2019

<p>1.1.3 Q_nM</p>	<p><i>Average percentage of courses having focus on employability/ entrepreneurship/ skill development offered by the University</i></p> <p>1.1.3.1: Number of courses having focus on employability/ entrepreneurship/ skill development year wise during the last five years</p> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the Course with Code • Activities with direct bearing on Employability/ Entrepreneurship/ Skill development • Name of the Programme <p>Formula:</p> $\text{Percentage per year} = \frac{\text{Number of courses having focus on employability or entrepreneurship or skill development}}{\text{Number of courses in all Programmes}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Programme/ Curriculum/ Syllabus of the courses • Minutes of the Boards of Studies/ Academic Council meetings with approvals for these courses • MoU's with relevant organizations for these courses, if any • Average percentage of courses having focus on employability/ entrepreneurship (Data Template) 	<p>10</p>
<p>BVoc in Desktop publishing under ministry of ITes(deen Upadhyay kaushal kendra</p>		

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University -amirkumar@gmail.com

Cc:

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Thanks and regards,

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On Fri, 12 Apr 2019 at 6:10 pm, Kishori Lal Bansal

<kishorilalbansal@yahoo.co.in> wrote:

Madam

I hav gone through the agenda and approved
.pls go ahead.

Thanks

Dr k l Bansal
Professor & Head
Computer science Department
H P University Shimla
09418915009

[Sent from Yahoo Mail for iPhone](#)

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Key Indicator – 1.2 Academic Flexibility (50)

Metric No.		Weightage
1.2.1	<i>Percentage of new courses introduced of the total number of courses across all programs offered during the last five years</i>	30
Q _n M	1.2.1.1: How many new courses were introduced within the last five years 1.2.1.2 : Number of courses offered by the institution across all Programmes during the last five years	

	<p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the new course introduced • Name of the Programme <p>Formula:</p> $\frac{\text{Number of new courses introduced during the last five years}}{\text{Number of courses offered during the last five years}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Minutes of relevant Academic Council/BOS meeting • Any additional information • Institutional data in prescribed format (Data Template as of 1.1.3) 	
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1.2.2	<p>Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)</p> <p>1.2.2.1: Number of Programmes in which CBCS/ Elective course system implemented.</p> <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Names of all Programmes adopting CBCS • Names of all Programmes adopting elective course system <p>Formula:</p> $\frac{\text{Number of Programmes in which CBCS or elective course system implemented}}{\text{Total number of Programmes offered}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Minutes of relevant Academic Council/BOS meetings • Institutional data in prescribed format (Data Template as of 1.1.2) 	20
Q_nM		

Key Indicator – 1.3 Curriculum Enrichment (30)

Metric No.		Weightages
1.3.1	<p><i>Institution integrates crosscutting issues relevant to Professional Ethics ,Gender, Human Values ,Environment and Sustainability into the Curriculum</i></p> <p>Write description in maximum of 500 words</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Upload the list and description of the courses which address the Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum 	5
1.3.2	<p><i>Number of value-added courses for imparting transferable and life skills offered during last five years</i></p> <p>1.3.2.1: How many new value-added courses are added within the last 5</p>	10
Q_nM		

	<p>years</p> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Names of the value added courses with 30 or more contact hours No. of times offered during the same year Total no. of students completing the course in the year <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information Brochure or any other document relating to value added courses List of value added courses (Data Template) 													
<p>1.3.3</p> <p>Q_nM</p>	<p><i>Average Percentage of students enrolled in the courses under 1.3.2 above</i></p> <p>1.3.3.1: Number of students enrolled in value-added courses imparting transferable and life skills offered year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Names of the value added courses with 30 or more contact hours No. of times offered during the same year Total no. of students completing the course in the year <p>Formula:</p> $\frac{\text{Number of students enrolled in the courses during the last five years}}{\text{Number of students}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information List of students enrolled (Data Template as of 1.3.2) 	Year						Number						<p>10</p>
Year														
Number														
<p>1.3.4</p> <p>Q_nM</p>	<p><i>Percentage of students undertaking field projects / research projects / internships (Data for the latest completed academic year)</i></p> <p>1.3.4.1: Number of students undertaking field project or research projects or internships</p> <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> Names of the Programme No. of students undertaking field projects /research projects/ internships <p>Formula:</p> $\frac{\text{Number of students undertaking field projects or research projects or interships}}{\text{Total number of students}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information 	<p>5</p>												

	<ul style="list-style-type: none"> List of Programmes and number of students undertaking field projects research projects// internships (Data Template) 	
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Key Indicator – 1.4 Feedback System (20)

Metric No.		Weightage
1.4.1 Q_nM	<p><i>Structured feedback for design and review of syllabus – semester wise / year wise is received from</i> 1) Students, 2) Teachers, 3) Employers, 4) Alumni Options: A. All 4 of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p align="center">} Opt one</p> <p>Data Requirements: (As per Data Template) Report of analysis of feedback received from different stakeholders year wise</p> <p>File Description</p> <ul style="list-style-type: none"> URL for stakeholder feedback report Action taken report of the University on feedback report as stated in the minutes of the Governing Council, Syndicate, Board of Management (Upload) Any additional information (Upload) 	10
1.4.2 Q_nM	<p><i>Feedback processes of the institution may be classified as follows:</i> A. Feedback collected, analysed and action taken and feedback available on website B. Feedback collected, analysed and action has been taken C. Feedback collected and analysed D. Feedback collected E. Feedback not collected</p> <p align="center">} Opt one</p> <p>Documents: Upload Stakeholder feedback report, Action taken report of the university on it as stated in the minutes of the Governing Council, Syndicate, Board of Management</p> <p>File Description</p>	10

	<ul style="list-style-type: none"> • Upload any additional information • URL for feedback report 	
--	--	--

Criterion II - Teaching-Learning and Evaluation (200)

Key Indicator - 2.1 Student Enrolment and Profile (10)

Metric No.		Weightage												
2.1.1 Q _n M	<p><i>Demand Ratio (Average of last five years)</i> 2.1.1.1: Number of seats available year wise during the last five years</p> <table border="1"> <tr> <td align="center">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td align="center">Number</td> <td align="center">Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of seats available in all the Programmes • Total number of eligible applications received • Total number of Seats filled against sanctioned seats <p>Formula: $\frac{\text{Number of eligible applications received}}{\text{Number of seats available}} = \text{Ratio Per Year}$ $\text{Average Ratio} = \frac{\sum \text{Ratio per Year}}{5}$</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information <p>Demand Ratio (Average of Last five years) based on Data Template upload the document</p>	Year						Number	Nil					5
Year														
Number	Nil													
2.1.2 Q _n M	<p><i>Average percentage of seats filled against reserved categories (SC, ST, OBC, Divyangjan, etc.) as per applicable reservation policy during the last five years (Excluding Supernumerary Seats)</i> 2.1.2.1: Number of actual students admitted from the reserved categories year wise during the last five years</p> <table border="1"> <tr> <td align="center">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td align="center">Number</td> <td align="center">Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of students admitted from the reserved category • Total number of seats earmarked for reserved category as per GOI or State Government rule <p>Formula:</p>	Year						Number	Nil					5
Year														
Number	Nil													

	$\text{Percentage per year} = \frac{\text{Actual number of students admitted from the reserved categories}}{\text{Number of seats earmarked for reserved category as per GOI or State Government rule}} \times 100$	
	$\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$	
	<p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information Average percentage of seats filled against seats reserved (Data Template) 	

Key Indicator - 2.2 Catering to Student Diversity (20)

Metric No.		Weightage
2.2.1 Q ₁ M	<p><i>The institution assesses the learning levels of the students-and organises special Programmes for advanced learners and slow learners.</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Paste link for additional information Upload Any additional information 	10
2.2.2 Q _n M	<p><i>Student - Full time teacher ratio (Data for the latest completed academic year)</i></p> <p>Data Requirement:</p> <ul style="list-style-type: none"> Total number of students enrolled in the institution Total number of full time teachers in the institution <p>Formula: Students : Teachers</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information 	10

Key Indicator - 2.3 Teaching - Learning Process (20)

Metric No.		Weightage
2.3.1 Q ₁ M	<p><i>Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Upload any additional information Link for Additional Information 	6

<p>2.3.2</p> <p>Q₁M</p>	<p>Teachers use ICT enabled tools including online resources for effective teaching and learning processes</p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Provide link for webpage describing the " LMS/ Academic management system" 	<p>6</p>
<p>2.3.3</p> <p>Q_nM</p>	<p>Ratio of students to mentor for academic and other related issues (Data for the latest completed academic year data)</p> <p>2.3.3.1: Number of mentors Number of students assigned to each Mentor</p> <p>Formula: Mentor : Mentee</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload year wise, number of students enrolled and full time teachers on roll. • Circulars pertaining to assigning mentors to mentees • mentor/mentee ratio 	<p>8</p>

Key Indicator - 2.4 Teacher Profile and Quality (50)

Metric No.		Weightage
<p>2.4.1</p> <p>Q_nM</p>	<p>Average percentage of full time teachers against sanctioned posts during the last five years</p> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of full time teachers • Number of sanctioned posts <p>Formula:</p> <p>Percentage per year = $\frac{\text{Number of full time teachers}}{\text{Number of sanctioned posts}} \times 100$</p> <p align="center">Average percentage = $\frac{\sum \text{Percentage per year}}{5}$</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Year wise full time teachers and sanctioned posts for 5 years (Data Template) • Any additional information • List of the faculty members authenticated by the Head of HEI 	<p>15</p>

<p>2.4.2 QnM</p>	<p><i>Average percentage of full time teachers with Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit. during the last five years</i></p> <p>2.4.2.1: Number of full time teachers with <i>Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.</i> year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of full time teachers with <i>Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.</i> • Total number of full time teachers <p>Formula:</p> <p style="text-align: center;">Percentage per year =</p> $\frac{\text{Number of full time teachers with Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.}}{\text{Number of full time teachers}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • List of number of full time teachers with <i>Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.</i> and number of full time teachers for 5 years (Data Template) 	Year						Number						<p style="text-align: center;">15</p>
Year														
Number														
<p>2.4.3 QnM</p>	<p><i>Average teaching experience of full time teachers in the same institution (Data for the latest completed academic year in number of years)</i></p> <p>2.4.3.1: Total experience of full-time teachers Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Name and Number of full time teachers with years of teaching experiences <p>Formula:</p> $\frac{\text{Sum of total experience of full time teachers in the same institution}}{\text{Number of full time teachers}}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • List of Teachers including their PAN, designation, dept and experience details (Data Template as of 2.4.1) 	<p style="text-align: center;">10</p>												

<p>2.4.4 Q_nM</p>	<p>Average percentage of full time teachers who received awards, recognition, fellowships at State, National, International level from Government/Govt. recognised bodies during the last five years</p> <p>2.4.4.1: Number of full time teachers receiving awards from state /national /international level from Government/Govt. recognized bodies year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of full time teachers receiving awards from State, National, International level • Number of full time teachers <p>Formula:</p> $\frac{\text{Number of full time teachers receiving awards from state level, national level, international level during the last five years}}{\text{Average number of full time teachers during the last five years}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Institutional data in prescribed format (Data Template) • Any additional information • e-copies of award letters (scanned or soft copy) 	Year						Number						<p>10</p>
Year														
Number														

Key Indicator - 2.5 Evaluation Process and Reforms (40)

Metric No.		Weightage												
<p>2.5.1 Q_nM</p>	<p>Average number of days from the date of last semester-end/ year- end examination till the declaration of results during the last five years</p> <p>2.5.1.1: Number of days from the date of last semester-end/ year- end examination till the declaration of results year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number of days</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Semester wise/ year wise • Last date of the last semester-end/ year- end examination • Date of declaration of results of semester-end/ year- end examination • Number of days taken for declaration of the results • Average number of days for declaration of results during the last five years <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • List of Programmes and date of last semester and date of declaration of 	Year						Number of days						<p>15</p>
Year														
Number of days														

	results (Data Template)													
2.5.2 Q _n M	<p><i>Average percentage of student complaints/grievances about evaluation against total number appeared in the examinations during the last five years</i></p> <p>2.5.2.1: Number of complaints/grievances about evaluation year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years:</p> <ul style="list-style-type: none"> • Number of complaints/grievances about evaluation • Total number of students appeared in the examinations <p>Formula:</p> $\text{Percentage per year} = \frac{\text{Number of complaints or grievances about evaluation}}{\text{Number of students appeared in the examination}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Number of complaints and total number of students appeared year wise 	Year						Number						10
Year														
Number														
2.5.3 Q _i M	<p><i>IT integration and reforms in the examination procedures and processes (continuous internal assessment and end-semester assessment) have brought in considerable improvement in examination management system of the institution</i></p> <p>Write description in maximum of 500 words</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Year wise number of applications, students and revaluation cases 	10												
2.5.4 Q _n M	<p><i>Status of automation of Examination division along with approved Examination Manual</i></p> <p><i>A. 100% automation of entire division & implementation of Examination Management System (EMS)</i></p> <p><i>B. Only student registration, Hall ticket issue & Result Processing</i></p> <p><i>C. Only student registration and result processing</i></p> <p><i>D. Only result processing</i></p> <p><i>E. Only manual methodology</i></p> <p>Data Requirements: (As per Data Template)</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Current Manual of examination automation system • Annual reports of examination including the present status of automation 	5												

	<ul style="list-style-type: none"> • Current manual of examination automation system and Annual reports of examination including the present status of automation (Data Template) • Any additional information 	
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Key Indicator - 2.6 Student Performance and Learning Outcomes (30)

Metric No.		Weightage
2.6.1 Q₁M	<p><i>The institution has stated learning outcomes (generic and programme specific)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for Additional Information • Upload COs for all courses (exemplars from Glossary) 	10
2.6.2 Q₁M	<p><i>Attainment of Programme outcomes, Programme specific outcomes and course outcomes are evaluated by the institution</i></p> <p>Describe the method of measuring the level of attainment of POs , PSOs and COs in not more than 500 words.</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for Additional Information 	10
2.6.3 Q_nM	<p><i>Pass percentage of students (Data for the latest completed academic year)</i></p> <p>2.6.3.1: Total number of final year students who passed the university examination</p> <p>2.6.3.2: Total number of final year students who appeared for the examination</p> <p>Data Requirement: (As per Data Template)</p> <ul style="list-style-type: none"> • Programme Code • Name of the Programme • Number of students appeared • Number of students passed • Pass percentage <p>Formula:</p> $\frac{\text{Total number of final year students who passed in the university examination}}{\text{Total number of final year students who appeared for the examination}} \times 100$	10

	File Description <ul style="list-style-type: none"> • Upload list of Programmes and number of students passed and appeared in the final year examination (Data Template) • Upload any additional information • Paste link for the annual report 	
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Key Indicator - 2.7 Student Satisfaction Survey (30)

Metric No.		Weightage
2.7.1 Q _n M	<p>Online student satisfaction survey regarding teaching learning process. (Online survey to be conducted)</p> <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Name/ Class/ Gender • Student Id number/ Adhar Id number • Mobile number • Email id • Degree Programme <p>(Database of all currently enrolled students need to be prepared and shared with NAAC along with the online submission of QIF)</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Upload database of all currently enrolled students (Data Template) 	30

Criterion III - Research, Innovations and Extension (250)

Key Indicator - 3.1 Promotion of Research and Facilities (20)

Metric No.		Weightage												
3.1.1 Q _i M	<p>The institution Research facilities are frequently updated and there is well defined policy for promotion of research which is uploaded on the institutional website and implemented</p> <p>Documents: Minutes of the Governing Council/ Syndicate/Board of Management related to research promotion policy and its adoption</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Minutes of the Governing Council/ Syndicate/Board of Management related to research promotion policy adoption • URL of Policy document on promotion of research uploaded on website 	2												
3.1.2 Q _n M	<p>The institution provides seed money to its teachers for research (average per year INR in Lakhs)</p> <p>3.1.2.1: The amount of seed money provided by institution to its faculty year wise during the last five years(INR in lakhs)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Year						INR in	Nil					3
Year														
INR in	Nil													

lakhs					
--------------	--	--	--	--	--

Data Requirement for last five years: (As per Data Template)

- Name of the teacher getting seed money
- The amount of seed money
- Year of receiving grant

Formula:

$$\frac{\text{The amount of seed money provided by institution to its faculty in the last 5 years}}{5}$$

File Description (Upload)

- Any additional information
- Minutes of the relevant bodies of the University
- Budget and expenditure statements signed by the Finance Officer indicating seed money provided and utilized
- List of teachers receiving grant and details of grant received (Data Template)

3.1.3
Q_nM

Percentage of teachers receiving national/ international fellowship/financial support by various agencies for advanced studies/ research during the last five years

3

3.1.3.1: The number of teachers who received national/ international fellowship/financial support by various agencies for advanced studies / research year wise during the last five years

Year					
Number of teachers					

Data Requirements for last five years: (As per Data Template)

- Name of the teacher received national/ international fellowship/financial support by various agencies for advanced studies / research
- Name of the award received
- Year received
- Awarding Agency

Total number of teachers who received national/ international fellowship/ financial support by various agencies for advanced studies/research during the last five years

$$\frac{\text{Total number of full time teachers during the last five years}}{\text{Total number of full time teachers during the last five years}} \times 100$$

File Description (Upload)

- Any additional information

	<ul style="list-style-type: none"> e-copies of the award letters of the teachers List of teachers and their international fellowship details (Data Templates) 													
3.1.4 Q_nM	<p><i>Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other research fellows enrolled in the institution during the last five years</i></p> <p>3.1.4.1: The Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other research fellows enrolled in the institution year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Name of Research fellow Year of enrolment Duration of fellowship Type of the fellowship Granting agency <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information List of research fellows and their fellowship details (Data Template) 	Year						Number	Nil					4
Year														
Number	Nil													
3.1.5 Q_nM	<p><i>Institution has the following facilities to support research</i></p> <ol style="list-style-type: none"> <i>1. Central Instrumentation Centre</i> <i>2. Animal House/Green House</i> <i>3. Museum</i> <i>4. Media laboratory/Studios</i> <i>5. Business Lab</i> <i>6. Research/Statistical Databases</i> <i>7. Mootcourt</i> <i>8. Theatre</i> <i>9. Art Gallery</i> <p>Options:</p> <p>A. Any 4 or more of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Data Requirements:</p> <ul style="list-style-type: none"> Name of the facility Year of establishment Geotagged pictures <p>File Description</p> <ul style="list-style-type: none"> Paste link of videos and geotagged photographs 	3												

	<ul style="list-style-type: none"> • Upload the list of facilities provided by the university and their year of establishment • Upload any additional information 	
3.1.6 Q_nM	<p><i>Percentage of departments with UGC-SAP, CAS, DST-FIST, DBT, ICSSR and other recognitions by national and international agencies (Data for the latest completed academic year)</i></p> <p>3.1.6.1: The Number of departments with UGC-SAP, CAS, DST-FIST , DBT, ICSSR and other similar recognitions by national and international agencies Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the Department • Name of the Scheme • Name of the funding agency • Year of Award • Funds provided • Duration of award <p>Formula:</p> $\frac{\text{Number of departments with UGC – SAP, CAS, DST – FIST, DBT, ICSSR and other similar recognitions}}{\text{Total number of departments offering academic programmes}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • e-version of departmental recognition award letters • List of departments and award details (Data Template) 	5

Key Indicator - 3.2 Resource Mobilization for Research (20)

Metric No.		Weightage												
3.2.1 Q_nM	<p><i>Extramural funding for Research (Grants sponsored by the non-government sources such as industry, corporate houses, international bodies for research projects) endowments, Chairs in the University during the last five years (INR in Lakhs)</i></p> <p>3.2.1.1: Total Grants for research projects sponsored by the non-government sources such as industry, corporate houses, international bodies, endowments, Chairs in the institution year wise during the last five years (INR in Lakhs)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in Lakhs</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Year						INR in Lakhs	Nil					5
Year														
INR in Lakhs	Nil													

	<p>Data requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the Project/ Endowments, Chairs • Name of the Principal Investigator • Department of Principal Investigator • Year of Award • Funds provided • Duration of the project <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • e-copies of the grant award letters for research projects sponsored by non-government • List of project and grant details (Data Template as of 3.1.6) 													
<p>3.2.2 Q_nM</p>	<p><i>Grants for research projects sponsored by the government agencies during the last five years (INR in Lakhs)</i></p> <p>3.2.2.1: Total Grants for research projects sponsored by the government agencies year wise during the last five years (INR in Lakhs)</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in Lakhs</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the Project • Name of the Principal Investigator • Department of Principal Investigator • Year of Award • Funds provided • Duration of the project • Funding Agency • Total amount of funds received <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • e-copies of the grant award letters for research projects sponsored by government • List of project and grant details (Data Template as of 3.1.6) 	Year						INR in Lakhs	Nil					<p>10</p>
Year														
INR in Lakhs	Nil													
<p>3.2.3 Q_nM</p>	<p><i>Number of research projects per teacher funded by government and non-government agencies during the last five years</i></p> <p>3.2.3.1: Number of research projects funded by government and non-government agencies during the last five years 3.2.3.2 : Number of full time teachers worked in the institution during the last 5 years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Year						<p>5</p>						
Year														

	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px;">Number</td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> </tr> </table>	Number						
Number								
	<p>Data requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of Principal Investigator • Duration of project • Name of the research project • Amount / Fund received • Name of funding agency • Year of sanction • Department of recipient <p>Formula:</p> $\frac{\text{Total number of research projects funded by government and non – government agencies during the last five years}}{\text{Average number of full time teachers during the last five years}}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • List of research projects and funding details (Data Template as of 3.1.6) • Any additional information • Supporting document from Funding Agency • Paste Link for the funding agency website 							

Key Indicator - 3.3 Innovation Ecosystem (30)

Metric No.		Weightage												
3.3.1 Q _i M	<p><i>Institution has created an eco system for innovations including Incubation centre and other initiatives for creation and transfer of knowledge</i></p> <p>Describe available incubation centre and evidence of its usage (activity) within a maximum of 500 words</p> <p>File description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for additional information 	10												
3.3.2 Q _n M	<p><i>Number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR), entrepreneurship, skill development during the last five years</i></p> <p>3.3.2.1: Total number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR), entrepreneurship, skill development year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px;">Year</td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> </tr> <tr> <td>Number</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Year						Number	Nil					10
Year														
Number	Nil													

	<p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the workshops / seminars • Number of Participants • Date (From -to) • Link to the activity report on the website <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Report of the event • Any additional information • List of workshops/seminars during last 5 years (Data Template) 													
<p>3.3.3 Q_nM</p>	<p><i>Number of awards / recognitions received for research/innovations by the institution/teachers/research scholars/students during the last five years</i></p> <p>3.3.3.1: Total number of awards / recognitions received for <i>research/innovations</i> won by institution/teachers/research scholars/students year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td>2016</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td>01</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the Awardee • Name of the Awarding Agency with contact details • Year of Award <p>File Description (Upload)</p> <ul style="list-style-type: none"> • e- copies of award letters • Any additional information • List of innovation and award details (Data Template) 	Year	2016					Number	01					<p>10</p>
Year	2016													
Number	01													
<p>Madhulata kumar Research scholar UCOST 2016</p>														



11th Uttarakhand State Science & Technology Congress 2016-17

Young Scientist Award


This is to certify that
Madhulata Kumari
 has been awarded
 Young Scientist Award for Best Oral/Poster Presentation (Category 1/2)
 under the discipline

Mathematics; Statistics & Computer Science

11th Uttarakhand State Science & Technology Congress 2016-17

02nd – 04th March, 2017


 (Ashutosh Mishra)
 PHD
 Organizing Secretary
 11th USSTC


 (Rajendra Dobhal)
 PhD; FAFESC; FNASc
 Chairman - 11th USSTC
 Director General

Uttarakhand State Council for Science & Technology, Dehradun

Key Indicators - 3.4 Research Publications and Awards (100)

Metric No.		Weightage
3.4.1 Q _n M	<p><i>The institution ensures implementation of its stated Code of Ethics for research</i></p> <p>3.4.1.1 The institution has a stated Code of Ethics for research and the implementation of which is ensured through the following:</p> <ol style="list-style-type: none"> 1. Inclusion of research ethics in the research methodology course work 2. Presence of institutional Ethics committees (Animal, chemical, bio-ethics etc) 3. Plagiarism check 4. Research Advisory Committee <p>Options:</p> <p>A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Code of ethics for Research document, Research Advisory committee and ethics committee constitution and list of members on these 	5

	<p>committees, software used for Plagiarism check, link to Website</p> <ul style="list-style-type: none"> Any additional information 													
<p>3.4.2</p> <p>Q_nM</p>	<p><i>The institution provides incentives to teachers who receive state, national and international recognitions/awards</i></p> <p>1. Commendation and monetary incentive at a University function 2. Commendation and medal at a University function 3. Certificate of honor 4. Announcement in the Newsletter / website</p> <p>Options:</p> <p>A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Data Requirements: (As per Data Template of 2.4.4)</p> <ul style="list-style-type: none"> Name of the Awardee with contact details Name of the Awarding Agency Year of Award Incentive details <p>File Description (Upload)</p> <ul style="list-style-type: none"> e- copies of the letters of awards Any additional information <p>List of Awardees and Award details (Data Template as of 2.4.4)</p>	<p>5</p>												
<p>3.4.3</p> <p>Q_nM</p>	<p><i>Number of Patents published/awarded during the last five years</i></p> <p>3.4.3.1: Total number of Patents published/awarded year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Name of the Patent published/awarded Patent Number Year of Award <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information List of patents and year it was awarded (Data Template) 	Year						Number	Nil					<p>10</p>
Year														
Number	Nil													
<p>3.4.4</p> <p>Q_nM</p>	<p><i>Number of Ph.D's awarded per teacher during the last five years</i></p> <p>3.4.4.1: How many Ph.D's are awarded within last 5 years 3.4.4.2 : Number of teachers recognized as guides during the last five years</p>	<p>10</p>												

	<p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the PhD scholar • Name of the Department • Name of the guide/s • Year of registration of the scholar • Year of award of PhD <p>Formula:</p> $\frac{\text{Number of Ph. D degrees awarded during the last five years}}{\text{Number of Teachers as a recognised guides during the last five years}}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • URL to the research page on HEI web site • List of PhD scholars and their details like name of the guide , title of thesis, year of award etc (Data Template) • Any additional information 													
<p>3.4.5 Q_nM</p>	<p><i>Number of research papers per teacher in the Journals notified on UGC website during the last five years</i></p> <p>3.4.5.1: Number of research papers in the Journals notified on UGC website during the last five years</p> <table border="1"> <tr> <td>Year</td> <td>2020</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td>01</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Title of paper • Name of the author/s • Department of the teacher • Name of journal • Year of publication • ISBN/ISSN number <p>Formula:</p> $\frac{\text{Number of publications in UGC notified journals during the last five years}}{\text{Average number of full time teachers during the last five years}}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • List of research papers by title, author, department, name and year of publication (Data Template) 	Year	2020					Number	01					<p>15</p>
Year	2020													
Number	01													
<p>3.4.6 Q_nM</p>	<p><i>Number of books and chapters in edited volumes published per teacher during the last five years</i></p> <p>3.4.6.1: Total number of books and chapters in edited volumes / books</p>	<p>15</p>												

published, and papers in national/international conference-proceedings year wise during the last five years

Year	2016				
Number	01				

Data Requirements for last five years: (As per Data Template)

- Name of the teacher: Title of the paper
- Title of the book published: Name of the author/s: Title of the proceedings of the conference
- Name of the publisher: National / International
- National / international : ISBN/ISSN number of the proceeding
- Year of publication:

Formula:

$$\frac{\text{Total number of books and chapters in edited volumes, books published, and papers in national/international conference proceedings during last five years}}{\text{Average number of full time teachers during the last five years}}$$

File Description (Upload)

- Any additional information
- List books and chapters in edited volumes / books published (Data Template)

Name-Umang

Title of paper- An Android application for poultry farm Management.

Title of book- Infinitude frontiers of research in Mathematics, Statistics and Computer Science

Publisher-National

ISBN-9788191070627

Year of Publication-2016

3.4.7

E-content is developed by teachers :

Q_nM

1. For e-PG-Pathshala
2. For CEC (Under Graduate)
3. For SWAYAM
4. For other MOOCs platform
5. For NPTEL/NMEICT/any other Government Initiatives
6. For Institutional LMS

Options:

- A. Any 5 or all of the above
- B. Any 4 of the above
- C. Any 3 of the above
- D. Any 2 of the above
- E. None of the above

Data Requirements: (As per Data Template)

- Name of the teacher

10

	<ul style="list-style-type: none"> • Name of the module • Platform on which module is developed • Date of launching e-content • Number of platforms on which e-content has been developed by teachers <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Give links or upload document of e-content developed • Details of e-content developed by teachers for e-PG-Pathshala, CEC (UG) (Data Template) 	
<p>3.4.8</p> <p>Q_nM</p>	<p><i>Bibliometrics of the publications during the last five years based on average Citation Index in Scopus/ Web of Science/PubMed</i></p> <p>Data Requirements for last five years:</p> <ul style="list-style-type: none"> • Title of the paper • Name of the author • Title of the journal • Year of publication • Citation Index <p>Formula:</p> $\frac{0.50 \times \text{Total number of Citation in SCOPUS in five years} + 0.50 \times \text{Total number of Citation in Web of Science in five years}}{0.50 \times \text{Total number of Publication in SCOPUS in five years} + 0.50 \times \text{Total number of Publication in Web of Science in five years}}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Bibliometrics of the publications during the last five years <p><i>* The Data obtained from infibnet will be used for the purpose of calculation of scores.</i></p>	<p>15</p>
<p>3.4.9</p> <p>Q_nM</p>	<p><i>Bibliometrics of the publications during the last five years based on Scopus/ Web of Science – h-Index of the University</i></p> <p>Data Requirements for last five years:</p> <p>Title of the paper- Mining and Analysis of Microsatellites in Human Coronavirus Genomes using the in-house built Java Pipeline</p> <ul style="list-style-type: none"> • • Name of the author-Umang • Title of the journal-advances in Bioresearch • Year of publication-2020 • H index- <p>Formula:</p>	<p>15</p>

	$\frac{h - \text{Index of Scopus} + h - \text{index of Web of Science}}{2}$ in last five years	
<p>File Description (Upload)</p> <ul style="list-style-type: none"> • Bibliometrics of publications based on Scopus/ Web of Science - h-index of the Institution • Any additional information <p>* The Data obtained from inflibnet will be used for the purpose of calculation of scores.</p>		

Key Indicators - 3.5 Consultancy (20)

Metric No.		Weightage												
3.5.1 Q _i M	<p><i>Institution has a policy on consultancy including revenue sharing between the institution and the individual and encourages its faculty to undertake consultancy</i></p> <p>File Description</p> <ul style="list-style-type: none"> • Upload minutes of the Governing Council/ Syndicate/Board of Management related to consultancy policy • Upload soft copy of the Consultancy Policy • Upload any additional information • Paste URL of the consultancy policy document 	5												
3.5.2 Q _n M	<p><i>Revenue generated from consultancy and corporate training during the last five years (INR in Lakhs)</i></p> <p>3.5.2.1: Total amount generated from consultancy and corporate training year wise during the last five years (INR in lakhs)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">INR in lakhs</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Names of the consultants • Name of consultancy project • Consulting/Sponsoring agency with contact details • Revenue generated (amount in rupees) • Total revenue generated in rupees • Details of Corporate training provided (Title of the training, corporates for which training has been provided, number of participants). <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Audited statements of accounts indicating the revenue generated through consultancy • Any additional information 	Year						INR in lakhs						15
Year														
INR in lakhs														

	<ul style="list-style-type: none"> List of consultants and revenue generated by them (Data Template) 	
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Key Indicators - 3.6 Extension Activities (40)

Metric No.		Weightage												
3.6.1 Q₁M	<p><i>Extension activities in the neighbourhood community in terms of impact and sensitising students to social issues and holistic development during the last five years</i></p> <p>Describe the impact of extension activities in sensitising students to social issues and holistic development within a maximum of 500 words</p> <p>File description</p> <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	6												
3.6.2 Q_nM	<p><i>Number of awards received by the Institution, its teachers and students from Government /Government recognised bodies in recognition of the extension activities carried out during the last five years</i></p> <p>3.6.2.1: Total number of awards and recognition received for extension activities from Government / Government recognised bodies year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Name of the activity Name of the Award/ recognition Name of the Awarding Government/ Government recognized bodies Year of the Award <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information Number of awards for extension activities in last 5 year (Data Template) e-copy of the award letters 	Year						Number						10
Year														
Number														
3.6.3 Q_nM	<p><i>Number of extension and outreach programs conducted by the institution including those through NSS/NCC/Red cross/YRC during the last five years (including Government initiated programs such as Swachh Bharat, Aids Awareness, Gender Issue, etc. and those organised in collaboration with industry, community and NGOs)</i></p> <p>3.6.3.1: Number of extension and outreach programs conducted by the</p>	12												

	<p>institution through NSS/NCC/Red cross/YRC etc. during the last five years (including Government initiated programs such as Swachh Bharat, Aids Awareness, Gender Issue, etc. and those organised in collaboration with industry, community and NGOs) year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name and number of the extension and outreach Programmes • Name of the collaborating agency: Non- government, industry, community with contact details <p>File description (Upload)</p> <ul style="list-style-type: none"> • Reports of the event organized • Any additional information • Number of extension and outreach Programmes conducted with industry, community etc for the last five years (Data Template) 	Year						Number						
Year														
Number														
<p>3.6.4 Q_nM</p>	<p><i>Average percentage of students participating in extension activities listed at 3.6.3 above during the last five years</i></p> <p>3.6.4.1: Total number of students participating in extension activities listed at 3.6.3 above year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the activity • Name of the scheme • Year of the activity • Number of students participating in such activities <p>Formula:</p> $\text{Percentage per year} = \frac{\text{Total Number of students participating in such activities}}{\text{Number of students}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File description (Upload)</p> <ul style="list-style-type: none"> • Report of the event • Any additional information • Average percentage of students participating in extension activities with Govt. or NGO etc (Data Template as of 3.6.3) 	Year						Number						<p>12</p>
Year														
Number														

Key Indicator - 3.7 Collaboration (20)

Metric No.		Weightage												
<p>3.7.1 Q_nM</p>	<p><i>Number of collaborative activities with other institutions/ research establishment/industry for research and academic development of faculty and students per year</i></p> <p>3.7.1.1: Total number of Collaborative activities with other institutions/ research establishment/industry for research and academic development of faculty and students year wise during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Title of the collaborative activity • Name of the collaborating agency with contact details • Source of financial support • Year of collaboration • Duration • Nature of the activity <p>Formula</p> $\frac{\text{Total Number of such activities during the last five years}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Copies of collaboration • Any additional information • Number of Collaborative activities for research, faculty etc (Data Template) 	Year						Number						<p>10</p>
Year														
Number														
<p>3.7.2 Q_nM</p>	<p><i>Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years</i></p> <p>3.7.2.1: Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirements for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Organisation with which MoU is signed • Name of the institution/ industry • Year of signing MoU • Duration • List the actual activities under each MoU • Year wise Number of students/teachers participated under MoUs 	Year						Number						<p>10</p>
Year														
Number														

	<p>File Description (Upload)</p> <ul style="list-style-type: none"> e-copies of the MoUs with institution/ industry Any additional information <p>Details of functional MoUs with institutions of national, international importance, other universities during the last five years (Data Template)</p>	
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Criterion IV – Infrastructure and Learning Resources (100)

Key Indicator - 4.1 Physical Facilities (30)

Metric No		Weightage
4.1.1 Q _i M	<p><i>The institution has adequate facilities for teaching - learning. viz., classrooms, laboratories, computing equipment, etc.</i></p> <p>Describe the adequacy of facilities for teaching –learning as per the minimum specified requirement by statutory bodies within a maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Upload any additional information Paste link for additional information 	10
4.1.2 Q _i M	<p><i>The institution has adequate facilities for cultural activities, yoga, games (indoor, outdoor) and sports. (gymnasium, yoga centre, auditorium, etc.)</i></p> <p>Describe the adequacy facilities for cultural activities, yoga, games (indoor, outdoor) and sports which include specification about area/size, year of establishment and user rate within minimum of 500 characters and maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Upload any additional information Geotagged pictures Paste link for additional information 	5
4.1.3 Q _i M	<p>Availability of general campus facilities and overall ambience</p> <p>Describe the general campus facilities and its utilization in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Upload any additional information Paste link for additional information 	5
4.1.4 Q _n M	<p><i>Average percentage of expenditure excluding salary for infrastructure augmentation during the last five years (INR in Lakhs)</i></p> <p>4.1.4.1: Expenditure for infrastructure augmentation, excluding salary during the last five years (INR in lakhs)</p>	10

	<table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in lakhs</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Budget allocated for infrastructure augmentation • Total expenditure for infrastructure augmentation • Audited statement of accounts • Total expenditure excluding Salary <p>Formula:</p> $\text{Percentage per year} = \frac{\text{Expenditure for infrastructure augmentation excluding salary}}{\text{Total expenditure excluding salary}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Upload audited utilization statements • Upload Details of budget allocation, excluding salary during the last five years (Data Template) 	Year						INR in lakhs						
Year														
INR in lakhs														

Key Indicator - 4.2 Library as a Learning Resource (20)

Metric No.		Weightage
4.2.1 Q _i M	<p>Library is automated using Integrated Library Management System (ILMS) and has digitisation facility</p> <p>Describe the implementation of the automation of the Library and the digitization facility available and used in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for additional information 	4
4.2.2 Q _n M	<p>Institution has subscription for e-Library resources</p> <p>Library has regular subscription for the following:</p> <ol style="list-style-type: none"> 1. e – journals 2. e-books 3. e-ShodhSindhu 4. Shodhganga 5. Databases <p>Options:</p> <p>A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>File Description</p>	6

	<ul style="list-style-type: none"> • Upload any additional information • Details of subscriptions like e-journals, e-books, e-ShodhSindhu, Shodhganga Membership etc.. (Data Template) 													
<p>4.2.3</p> <p>Q_nM</p>	<p><i>Average annual expenditure for purchase of books/ e-books and subscription to journals/e-journals during the last five years (INR in Lakhs)</i></p> <p>4.2.3.1: Annual expenditure for purchase of books and journals year wise during the last five years (INR in lakhs)</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in lakhs</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Expenditure on the purchase of books • Expenditure on the purchase of journals in ith year • Year of expenditure: <p>Formula:</p> $\frac{1}{5} \times \sum_{i=1}^5 \text{Expd}_i$ <p>Where: Expd_i = Expenditure in rupees on purchase of books and journals in ith year</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Audited statements of accounts <p>Details of annual expenditure for purchase of books and journals during the last five years (Data Template as of 4.2.2)</p>	Year						INR in lakhs						5
Year														
INR in lakhs														
<p>4.2.4</p> <p>Q_nM</p>	<p><i>Percentage per day usage of library by teachers and students (foot falls and login data for online access) (Data for the latest completed academic year)</i></p> <p>4.2.4.1: Number of teachers and students using library per day over last one year</p> <p>Data Requirements:</p> <ul style="list-style-type: none"> • Upload last page of accession register details • per day login/online users of library • Number of users using library through e-access • Number of physical users accessing library <p>Formula:</p> $\frac{\text{Number of teachers and students using library per day}}{\text{Total number of teachers and students}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Any additional information • Details of library usage by teachers and students (Library accession register, online accession details to be provided as supporting documents) 	5												

Key Indicator – 4.3 IT Infrastructure (30)

Metric No.		Weightage
<p>4.3.1 Q_nM</p>	<p><i>Percentage of classrooms and seminar halls with ICT - enabled facilities such as LCD, smart board, Wi-Fi/LAN, audio video recording facilities .(Data for the latest completed academic year)</i></p> <p>4.3.1.1: Number of classrooms and seminar halls with ICT facilities Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Number of classrooms with LCD facilities • Number of classrooms with Wi-Fi/LAN facilities • Number of seminar halls with ICT facilities <p>Formula:</p> $\frac{\text{Number of classrooms and seminar halls with ICT facilities}}{\text{Total number of classrooms/seminar halls in the institution}} \times 100$ <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for additional information • Upload Number of classrooms and seminar halls with ICT enabled facilities (Data Template) 	<p align="center">5</p>
<p>4.3.2 Q_iM</p>	<p><i>Institution has an IT policy, makes appropriate budgetary provision and updates its IT facilities including Wi-Fi facility</i></p> <p>Providing the salient features of the IT Policy and describe the process of implementation and adherence to the policy , budgetary provisions made and utilized and the expansion plan in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for additional information 	<p align="center">5</p>
<p>4.3.3 Q_nM</p>	<p><i>Student - Computer ratio (Data for the latest completed academic year)</i></p> <p>Number of students : Number of Computers available to students for academic purposes Data Requirements:</p> <ul style="list-style-type: none"> • Number of computers for academic purposes in working condition-05 • Total Number of students -100 <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Student – computer ratio 1:20 	<p align="center">10</p>

<p>4.3.4 Q_nM</p>	<p>Available bandwidth of internet connection in the Institution (Leased line)</p> <p>Options:</p> <p>A. ≥ 1 GBPS B. 500 MBPS - 1 GBPS C. 250 MBPS - 500 MBPS D. 50 MBPS - 250 MBPS E. < 50 MBPS</p> <p>Data Requirements: F. Available internet bandwidth-50 MBPS - 250 MBPS</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Details of available bandwidth of internet connection in the Institution 	<p>5</p>
<p>4.3.5 Q_nM</p>	<p>Institution has the following Facilities for e-content development</p> <ol style="list-style-type: none"> 1. Media centre 2. Audio visual centre 3. Lecture Capturing System(LCS) 4. Mixing equipments and softwares for editing <p>Options:</p> <p>A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Upload the names of the e-content development facilities <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Links of photographs • Facilities for e-content development such as Media Centre, Recording facility, LCS etc (Data Templates as of 3.4.7) 	<p>5</p>

Key Indicator - 4.4 Maintenance of Campus Infrastructure (20)

Metric No.		Weightage
<p>4.4.1 Q_nM</p>	<p>Average percentage expenditure incurred on maintenance of physical facilities and academic support facilities excluding salary component during the last five years</p> <p>4.4.1.1: Expenditure incurred on maintenance of physical facilities and academic support facilities excluding salary component year wise during the last five years (INR in lakhs)</p>	<p>10</p>

	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">INR in lakhs</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years:(As per Data Template)</p> <ul style="list-style-type: none"> • Non salary expenditure incurred • Expenditure incurred on maintenance of campus infrastructure <p>Formula:</p> $\text{Percentage per year} = \frac{\text{Expenditure on maintenance of physical and academic support facilities excluding salary component}}{\text{Total expenditure excluding salary component}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Audited statements of accounts. • Details about assigned budget and expenditure on physical facilities and academic facilities (Data Templates as of 4.1.4) 	Year						INR in lakhs						
Year														
INR in lakhs														
<p>4.4.2</p> <p>Q_nM</p>	<p><i>There are established systems and procedures for maintaining and utilizing physical, academic and support facilities - laboratory, library, sports complex, computers, classrooms etc.</i></p> <p>Describe policy details of systems and procedures for maintaining and utilizing physical, academic and support facilities within a minimum of 500 word and maximum of 1000 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Paste link for additional information 	<p>10</p>												

Criterion V - Student Support and Progression (100)

Key Indicator - 5.1 Student Support (30)

Metric No.		Weightage
<p>5.1.1</p> <p>Q_nM</p>	<p><i>Average percentage of students benefited by scholarships and freeships provided by the institution, Government and non-government agencies (NGOs) during the last five years (other than the students receiving scholarships under the government schemes for reserved categories)</i></p> <p>5.1.1.1: Number of students benefited by scholarships and freeships</p>	<p>10</p>

provided by the institution, Government and non-government agencies (NGOs) year wise during the last five years (other than the students receiving scholarships under the government schemes for reserved categories)

Year					
Number					

Data Requirement for last five years:(As per Data Template)

- Name of the scheme
- Number of students benefiting

Formula:

$$\text{Percentage per year} = \frac{\text{Number of students benefited by scholarships and freeships by institution, government and non-government agencies}}{\text{Number of students}} \times 100$$

$$\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$$

File Description

- Upload self attested letter with the list of students sanctioned scholarship
- Upload any additional information
- Average percentage of students benefited by scholarships and freeships provided by the institution, Government and non-government agencies (NGOs) during the last five years (Data Template)

5.1.2

Average percentage of students benefited by career counseling and guidance for competitive examinations offered by the Institution during the last five years

10

QnM

5.1.2.1: Number of students benefited by guidance for competitive examinations and career counselling offered by the institution year wise during the last five years

Year					
Number					

Data Requirement for last five years:(As per Data Template)

- Name of the scheme
- Number of students who have passed in the competitive exam
- Number of students benefited by career counseling.

Formula:

Percentage per year =

	<p>Number of students benefited by career counseling and guidance for competitive examinations</p> $\frac{\text{Number of students}}{\text{Number of students}} \times 100$ $\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> Any additional information Number of students benefited by guidance for competitive examinations and career counselling during the last five years (Data Template) 	
<p>5.1.3</p> <p>Q_nM</p>	<p><i>Following Capacity development and skills enhancement initiatives are taken by the institution</i></p> <ol style="list-style-type: none"> <i>Soft skills</i> <i>Language and communication skills</i> <i>Life skills (Yoga, physical fitness, health and hygiene)</i> <i>Awareness of trends in technology</i> <p>Options:</p> <ol style="list-style-type: none"> All of the above Any 3 of the above Any 2 of the above Any 1 of the above None of the above <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> Name of the capacity development and skills enhancement scheme Year of implementation Number of students enrolled Name of the agencies involved with contact details <p>File Description (Upload)</p> <ul style="list-style-type: none"> Link to Institutional website Any additional information Details of capacity development and skills enhancement schemes (Data Template) 	5
<p>5.1.4</p> <p>Q_nM</p>	<p><i>The Institution adopts the following for redressal of student grievances including sexual harassment and ragging cases</i></p> <ol style="list-style-type: none"> <i>Implementation of guidelines of statutory/regulatory bodies</i> <i>Organisation wide awareness and undertakings on policies with zero tolerance</i> <i>Mechanisms for submission of online/offline students' grievances</i> <i>Timely redressal of the grievances through appropriate committees</i> 	5

	<p>Options:</p> <p>A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Data Requirement: Upload the grievance redressal policy document with reference to prevention of sexual harassment committee and anti ragging committee, constitution of various committees for addressing the issues, minutes of the meetings of the committees, number of cases received and redressed.</p> <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Minutes of the meetings of student redressal committee, prevention of sexual harassment committee and Anti Ragging committee • Upload any additional information • Details of student grievances including sexual harassment and ragging cases 	
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Key Indicator - 5.2 Student Progression (40)

Metric No.		Weightage														
<p>5.2.1</p> <p>Q_nM</p>	<p><i>Average percentage of students qualifying in state/ national/ international level examinations during the last five years (eg: NET/SLET/GATE/GMAT/CAT/GRE/TOEFL/Civil Services/State government examinations)</i></p> <p>5.2.1.1: Number of students qualifying in state/ national/ international level examinations (eg: NET/SLET/GATE/GMAT/CAT/GRE/TOEFL/ Civil services/State government examinations) year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td style="text-align: center;">2015</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Number</td> <td style="text-align: center;">01(GATE)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>5.2.1.2: Number of students appearing in state/ national/ international level examinations (eg: NET/SLET/GATE/GMAT/CAT/GRE/TOEFL/ Civil Services/State government examinations) year wise during the last</p>	Year	2015						Number	01(GATE)						<p>10</p>
Year	2015															
Number	01(GATE)															

five years

Year					
Number					

Data Requirement for last five years: (As per Data Template)

Number of students selected to

- NET
- SLET
- GATE
- GMAT
- CAT
- GRE
- TOEFL
- Civil Services
- State government examinations

Formula:

$$\text{Percentage per year} = \frac{\text{Number of students qualifying in state,national,international level exams}}{\text{Number of students appeared for the state,national,International level exams}} \times 100$$

$$\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$$

File Description (Upload)

- Upload supporting data for the same
- Any additional information
- Number of students qualifying in state/ national/ international level examinations during the last five years (Data Template)

5.2.2

Average percentage of placement of outgoing students during the last five years

15

Q_nM

5.2.2.1: Number of outgoing students placed year wise during the last five years

Year					
Number					

Data Requirement for last five years: (As per Data Template)

- Name of the employer with contact details
- Number of students placed

Formula:

$$\text{Percentage per year} = \frac{\text{Number of outgoing students placed}}{\text{Number of outgoing students}} \times 100$$

	$\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Self attested list of students placed • Upload any additional information • Details of student placement during the last five years (Data Template) 	
5.2.3 Q_nM	<p><i>Percentage of recently graduated students who have progressed to higher education (previous graduating batch)</i></p> <p>5.2.3.1: Number of outgoing students progressing to higher education</p> <p>Data Requirement : (As per Data Template)</p> <p>Number of students proceeding from</p> <ul style="list-style-type: none"> • UG to PG • PG to MPhil • PG to PhD • MPhil to PhD • PhD to Post doctoral <p>Formula:</p> $\frac{\text{Number of outgoing students progressing to higher education}}{\text{Total number of final year students}} \times 100$ <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Upload supporting data for student/alumni • Any additional information • Details of student progression to higher education (Data Template) 	15

Key Indicator - 5.3 Student Participation and Activities (20)

Metric No.		Weightage												
5.3.1 Q_nM	<p><i>Number of awards/medals won by students for outstanding performance in sports/cultural activities at inter-university/state/national/international events (award for a team event should be counted as one) during the last five years</i></p> <p>5.3.1.1: Number of awards/medals won by students for outstanding performance in sports/cultural activities at inter-university/state/national/international level (award for a team event should be counted as one) year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> • Name of the award/ medal • Inter-university/State/National/ International 	Year						Number						10
Year														
Number														

	<ul style="list-style-type: none"> Name of the event File Description (Upload) <ul style="list-style-type: none"> e-copies of award letters and certificates Any additional information Number of awards/medals for outstanding performance in sports/cultural activities at inter-university/state/ national/international level during the last five year (Data Template) 													
5.3.2 Q ₁ M	<p><i>Presence of Student Council and its activities for institutional development and student welfare.</i></p> <p>Describe the <i>Student Council and its activities for institutional development and student welfare</i> within a maximum of 500 words</p> File Description <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	5												
5.3.3 Q _n M	<p><i>Average number of sports and cultural events / competitions organised by the institution per year</i></p> <p>5.3.3.1: Number of sports and cultural events / competitions organised by the institution year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Number</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years: (As per Data Template)</p> <ul style="list-style-type: none"> Name of the event / competition <p>Formula:</p> $\frac{\text{Number of sports and cultural events or competitions organised by the institution during the last 5 years}}{5}$ <p>File Description</p> <ul style="list-style-type: none"> Report of the event Upload any additional information Number of sports and cultural events / competitions organised per year (Data Template) 	Year						Number						5
Year														
Number														

Key Indicator - 5.4 Alumni Engagement (10)

Metric No.		Weightage
5.4.1 Q ₁ M	<p><i>The Alumni Association/Chapters (registered and functional) contributes significantly to the development of the institution through financial and other support services during the last five years</i></p> <p>Describe contribution of alumni association to the institution within a maximum of 500 words</p> File Description <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	2

<p>5.4.2</p> <p>Q_nM</p>	<p><i>Alumni contribution during the last five years (INR in lakhs)</i></p> <p>Options:</p> <p>A. ≥ 100 Lakhs B. 50Lakhs - 100 Lakhs C. 20 Lakhs - 50 Lakhs D. 5 Lakhs - 20 Lakhs E. <5 Lakhs</p> <p>Data Requirement for last five years (year wise):</p> <ul style="list-style-type: none"> Alumni association / Name of the alumnus Quantum of contribution Audited Statement of account of the institution reflecting the receipts. <p>File Description</p> <ul style="list-style-type: none"> Upload any additional information 	<p>8</p>
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Criterion VI - Governance, Leadership and Management (100)

Key Indicator - 6.1 Institutional Vision and Leadership (10)

Metric No.		Weightage
<p>6.1.1</p> <p>Q_nM</p>	<p><i>The institution has a clearly stated vision and mission which are reflected in its academic and administrative governance</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	<p>5</p>
<p>6.1.2</p> <p>Q_nM</p>	<p><i>The effective leadership is reflected in various institutional practices such as decentralization and participative management.</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	<p>5</p>

Key Indicator - 6.2 Strategy Development and Deployment (10)

Metric No.		Weightage
6.2.1 Q ₁ M	<p><i>The institutional Strategic plan is effectively deployed.</i></p> <p>Describe one successfully implemented activity based on the strategic plan within a maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Strategic Plan and deployment documents on the website • Paste link for additional information • Upload any additional information 	3
6.2.2 Q ₁ M	<p><i>The functioning of the institutional bodies is effective and efficient as visible from policies, administrative setup, appointment and service rules, procedures, etc.</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Paste link for additional information • Link to Organogram of the University webpage • Upload any additional information 	2
6.2.3 Q _n M	<p><i>Institution Implements e-governance in its areas of operations</i></p> <p>6.2.3.1 e-governance is implemented covering following areas of operation</p> <ol style="list-style-type: none"> 1. Administration 2. Finance and Accounts 3. Student Admission and Support 4. Examination <p>Options:</p> <ol style="list-style-type: none"> A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above <p>Data Requirements: (As per Data Template)</p> <ul style="list-style-type: none"> • Areas of e-governance Administration Finance and Accounts Student Admission and Support Examination • Name of the Vendor with contact details • Year of implementation <p>File Description (Upload)</p> <ul style="list-style-type: none"> • ERP (Enterprise Resource Planning) Document • Screen shots of user interfaces • Any additional information • Details of implementation of e-governance in areas of operation, Administration etc (Data Template) 	5

Key Indicator - 6.3 Faculty Empowerment Strategies (30)

Metric No.		Weightage												
6.3.1 Q _n M	<p><i>The institution has a performance appraisal system, promotional avenues and effective welfare measures for teaching and non-teaching staff</i></p> <p>Write description in maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Paste link for additional information • Upload any additional information 	4												
6.3.2 Q _n M	<p><i>Average percentage of teachers provided with financial support to attend conferences / workshops and towards membership fee of professional bodies during the last five years</i></p> <p>6.3.2.1: Number of teachers provided with financial support to attend conferences / workshops and towards membership fee of professional bodies year wise during the last five years</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Number</td> <td style="text-align: center;">Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years:(As per Data Template)</p> <ul style="list-style-type: none"> • Name of teacher • Name of conference/ workshop attended for which financial support provided • Name of the professional body for which membership fee is provided <p>Formula:</p> <p style="text-align: center;">Percentage per year = $\frac{\text{Number of teachers provided with financial support to attend conferences, workshops and towards membership fee of professional bodies}}{\text{Number of full time teachers}} \times 100$</p> <p style="text-align: center;">Average percentage = $\frac{\sum \text{Percentage per year}}{5}$</p> <p>File Description</p> <ul style="list-style-type: none"> • Upload any additional information • Details of teachers provided with financial support to attend conferences, workshops etc. during the last five years (Data Template) 	Year						Number	Nil					10
Year														
Number	Nil													
6.3.3 Q _n M	<p><i>Average number of professional development / administrative training Programmes organized by the institution for teaching and non teaching staff during the last five years</i></p> <p>6.3.3.1: Total number of professional development / administrative</p>	8												

training Programmes organized by the Institution for teaching and non teaching staff year wise during the last five years

Year					
Number	Nil				

Data Requirement for last five years:(As per Data Template)

- Title of the professional development Programme organised for teaching staff
- Title of the administrative training Programme organised for non-teaching staff
- Dates (From-to)

Formula:

$$\frac{\text{Total Number of professional development or administrative training Programmes organized for teaching and non teaching staff during the last five years}}{5}$$

File Description (Upload)

- Reports of the Human Resource Development Centres (UGC ASC or other relevant centres).
- Reports of Academic Staff College or similar centers
- Upload any additional information
- Details of professional development / administrative training Programmes organized by the University for teaching and non teaching staff (Data Template)

6.3.4

Q_nM

Average percentage of teachers undergoing online/ face-to-face Faculty Development Programmes (FDP)during the last five years (Professional Development Programmes, Orientation / Induction Programmes, Refresher Course, Short Term Course)

6.3.4.1: Total number of teachers undergoing online/ face-to-face Faculty Development Programmes (FDP)during the last five years (Professional Development Programmes, Orientation / Induction Programmes, Refresher Course, Short Term Course)year wise during the last five years

Year	2016	2019	2020		
Number	01	01	01		

Data Requirement for last five years:(As per Data Template)

- Name of teachers
- Title of the Programme
- Duration (From -to)

Formula:

8

	<p>Total Number of teaching staff attending such Programmes</p> $\text{Percentage per year} = \frac{\text{Total Number of teaching staff attending such Programmes}}{\text{Number of full time teachers}} \times 100$	
	$\text{Average percentage} = \frac{\sum \text{Percentage per year}}{5}$	
	<p>File Description</p> <ul style="list-style-type: none"> • IQAC report summary • Reports of the Human Resource Development Centres (UGC ASC or other relevant centers). • Upload any additional information • Details of teachers attending professional development Programmes during the last five years (Data Template) 	

Key Indicator – 6.4 Financial Management and Resource Mobilization (20)

Metric No.		Weightage												
6.4.1 Q _i M	<p><i>Institutional strategies for mobilisation of funds and the optimal utilisation of resources</i></p> <p>Describe the resource mobilisation policy and procedures of the Institution within a maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> • Paste link for additional information • Upload any additional information 	4												
6.4.2 Q _n M	<p><i>Funds / Grants received from government bodies during the last five years for development and maintenance of infrastructure (not covered under Criteria III and V) (INR in Lakhs)</i></p> <p>6.4.2.1: Total Grants received from government bodies for development and maintenance of infrastructure (not covered under Criteria III and V) year wise during the last five years (INR in Lakhs)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">INR in Lakhs</td> <td style="text-align: center;">Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years:(As per Data Template)</p> <ul style="list-style-type: none"> • Name of the government funding agencies/ individuals • Funds/ Grants received <p>File Description (Upload)</p> <ul style="list-style-type: none"> • Annual statements of accounts • Any additional information • Details of Funds / Grants received from government bodies during the last five years (Data Template) 	Year						INR in Lakhs	Nil					8
Year														
INR in Lakhs	Nil													

<p>6.4.3</p> <p>Q_nM</p>	<p><i>Funds / Grants received from non-government bodies, individuals, philanthropists during the last five years for development and maintenance of infrastructure (not covered under Criteria III and V) (INR in Lakhs)</i></p> <p>6.4.3.1: Total Grants received from non-government bodies, individuals, philanthropers year wise during the last five years (INR in Lakhs)</p> <table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>INR in Lakhs</td> <td>Nil</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Data Requirement for last five years:(As per Data Template)</p> <ul style="list-style-type: none"> Name of the non government funding agencies/ individuals Funds/ Grants received <p>File Description (Upload)</p> <ul style="list-style-type: none"> Annual statements of accounts Any additional information Details of Funds / Grants received from non-government bodies during the last five years (Data Template as of 6.4.2) 	Year						INR in Lakhs	Nil					<p>6</p>
Year														
INR in Lakhs	Nil													
<p>6.4.4</p> <p>Q_iM</p>	<p><i>Institution conducts internal and external financial audits regularly</i></p> <p>Enumerate the various internal and external financial audits carried out during the last five years with the mechanism for settling audit objections within a maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	<p>2</p>												

Key Indicator - 6.5 Internal Quality Assurance System (30)

Metric No.		Weightage
<p>6.5.1</p> <p>Q_iM</p>	<p><i>Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes by constantly reviewing the teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals</i></p> <p>Describe two practices institutionalized as a result of IQAC initiatives within a maximum of 500 words</p> <p>File Description</p> <ul style="list-style-type: none"> Paste link for additional information Upload any additional information 	<p>10</p>
<p>6.5.2</p> <p>Q_nM</p>	<p><i>Institution has adopted the following for Quality assurance</i></p> <ol style="list-style-type: none"> <i>Academic Administrative Audit (AAA) and follow up action taken</i> <i>Conferences, Seminars, Workshops on quality conducted</i> <i>Collaborative quality initiatives with other institution(s)</i> <i>Orientation programme on quality issues for teachers and students</i> <i>Participation in NIRF</i> <i>Any other quality audit recognized by state, national or international</i> 	<p>10</p>

	<p><i>agencies (ISO Certification, NBA)</i></p> <p>Options:</p> <p>A. Any 5 or all of the above B. Any 4 of the above C. Any 3 of the above D. Any 2 of the above E. Any 1of the above</p> <p>Data Requirement for last five years:(As per Data Template)</p> <p>Quality initiatives</p> <ul style="list-style-type: none"> • AQARs prepared/ submitted • Academic Administrative Audit (AAA) and follow up action • Conferences, Seminars, Workshops on quality conducted • Collaborative quality initiatives with other institution(s) • Orientation programme on quality issues for teachers and students • Participation in NIRF • ISO Certification • NBA or any other certification received <p>File Description</p> <ul style="list-style-type: none"> • Paste web link of Annual reports of University • Upload e-copies of the accreditations and certifications • Upload any additional information • Upload details of Quality assurance initiatives of the institution (Data Template) 	
6.5.3 QIM	<p><i>Incremental improvements made for the preceding five years with regard to quality (in case of first cycle)</i></p> <p><i>Post accreditation quality initiatives (second and subsequent cycles)</i></p> <p>Describe quality enhancement initiatives in the academic and administrative domains successfully implemented during the last five years within a Maximum of 500 words each</p> <p>File Description</p> <ul style="list-style-type: none"> • Paste link for additional information • Upload any additional information 	10

Criterion VII – Institutional Values and Best Practices (100)

Key Indicator - 7.1 Institutional Values and Social Responsibilities (50)

Metric No.		Weightage
	Gender Equity	
7.1.1 QIM	<i>Measures initiated by the Institution for the promotion of gender equity during the last five years.</i>	5

	<p>Describe gender equity & sensitization in curricular and co-curricular activities, facilities for women on campus etc., within 500 words</p> <p>Provide Web link to:</p> <ul style="list-style-type: none"> • Annual gender sensitization action plan • Specific facilities provided for women in terms of: <ul style="list-style-type: none"> a. Safety and security b. Counselling c. Common Rooms d. Day care center for young children e. Any other relevant information 	
Environmental Consciousness and Sustainability		
<p>7.1.2 Q_nM</p>	<p><i>The Institution has facilities for alternate sources of energy and energy conservation measures</i></p> <ol style="list-style-type: none"> 1. Solar energy <input type="checkbox"/> 2. Biogas plant <input type="checkbox"/> 3. Wheeling to the Grid <input type="checkbox"/> 4. Sensor-based energy conservation <input type="checkbox"/> 5. Use of LED bulbs/ power efficient equipment <input type="checkbox"/> <p>Options:</p> <p>A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Upload:</p> <ul style="list-style-type: none"> • <i>Geotagged Photographs</i> • <i>Any other relevant information</i> 	5
<p>7.1.3 Q_iM</p>	<p><i>Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words)</i></p> <ul style="list-style-type: none"> • Solid waste management • Liquid waste management • Biomedical waste management • E-waste management • Waste recycling system • Hazardous chemicals and radioactive waste management <p>Provide web link to</p> <ul style="list-style-type: none"> • Relevant documents like agreements/MoUs with Government and other approved agencies • Geotagged photographs of the facilities • Any other relevant information 	4

7.1.4 QnM	<p>Water conservation facilities available in the Institution:</p> <ol style="list-style-type: none"> 1. Rain water harvesting <input type="checkbox"/> 2. Borewell /Open well recharge <input type="checkbox"/> 3. Construction of tanks and bunds <input type="checkbox"/> 4. Waste water recycling <input type="checkbox"/> 5. Maintenance of water bodies and distribution system in the campus <input type="checkbox"/> <p>Options:</p> <p>A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1of the above E. None of the above</p> <p>Upload :</p> <ul style="list-style-type: none"> • Geotagged photographs / videos of the facilities • Any other relevant information 	4
7.1.5 QnM	<p>Green campus initiatives include (4)</p> <p>7.1.5.1. The institutional initiatives for greening the campus are as follows:</p> <ol style="list-style-type: none"> 1. Restricted entry of automobiles <input type="checkbox"/> 2. Use of Bicycles/ Battery powered vehicles <input type="checkbox"/> 3. Pedestrian Friendly pathways <input type="checkbox"/> 4. Ban on use of Plastic <input type="checkbox"/> 5. landscaping with trees and plants <input type="checkbox"/> <p>Options:</p> <p>A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1of the above E. None of the above</p> <p>Upload</p> <ul style="list-style-type: none"> • Geotagged photos / videos of the facilities • Various policy documents / decisions circulated for implementation • Any other relevant documents 	4
7.1.6 QnM	<p>Quality audits on environment and energy are regularly undertaken by the institution (5)</p> <p>7.1.6.1. The institutional environment and energy initiatives are confirmed</p>	5

	<p>through the following</p> <ol style="list-style-type: none"> 1.Green audit <input type="checkbox"/> 2. Energy audit 3.Environment audit 4.Clean and green campus recognitions/awards <input type="checkbox"/> 5. Beyond the campus environmental promotional activities <input type="checkbox"/> <p>Options:</p> <ol style="list-style-type: none"> A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1of the above E. None of the above <p>Upload:</p> <ul style="list-style-type: none"> • Reports on environment and energy audits submitted by the auditing agency • Certification by the auditing agency • Certificates of the awards received • Any other relevant information 	
<p>7.1.7</p> <p>QnM</p>	<p><i>The Institution has disabled-friendly, barrier free environment</i></p> <ol style="list-style-type: none"> 1. Built environment with ramps/lifts for easy access to classrooms. <input type="checkbox"/> 2. Disabled-friendly washrooms <input type="checkbox"/> 3. Signage including tactile path, lights, display boards and signposts <input type="checkbox"/> 4. Assistive technology and facilities for persons with disabilities (<i>Divyangjan</i>) accessible website, screen-reading software, mechanized equipment <input type="checkbox"/> 5. Provision for enquiry and information : Human assistance, reader, scribe, soft copies of reading material, screen reading <input type="checkbox"/> <p>Options:</p> <ol style="list-style-type: none"> A. Any 4 or all of the above B. Any 3 of the above C. Any 2 of the above D. Any 1of the above E. None of the above <p>Upload:</p> <ul style="list-style-type: none"> • Geotagged photographs / videos of the facilities • Policy documents and information brochures on the support to be provided • Details of the Software procured for providing the assistance • Any other relevant information 	<p>4</p>
<i>Inclusion and Situatedness</i>		
<p>7.1.8</p>	<p><i>Describe the Institutional efforts/initiatives in providing an inclusive</i></p>	<p>5</p>

Q _i M	<p><i>environment i.e., tolerance and harmony towards cultural, regional, linguistic, communal socioeconomic and other diversities (within 500 words).</i></p> <p>Provide Web link to:</p> <ul style="list-style-type: none"> Supporting documents on the information provided (as reflected in the administrative and academic activities of the Institution) Any other relevant information. 	
<i>Human Values and Professional Ethics</i>		
7.1.9 Q _i M	<p><i>Sensitization of students and employees of the Institution to the constitutional obligations: values, rights, duties and responsibilities of citizens</i></p> <p>Describe the various activities in the Institution for inculcating values for being responsible citizens as reflected in the Constitution of India within 500 words.</p> <p>Provide weblink to :</p> <ul style="list-style-type: none"> Details of activities that inculcate values; necessary to render students in to responsible citizens Any other relevant information 	4
7.1.10 Q _n M	<p><i>The Institution has a prescribed code of conduct for students, teachers, administrators and other staff and conducts periodic programmes in this regard.</i></p> <ol style="list-style-type: none"> The Code of Conduct is displayed on the website <input type="checkbox"/> There is a committee to monitor adherence to the Code of Conduct <input type="checkbox"/> Institution organizes professional ethics programmes for students, teachers, administrators and other staff <input type="checkbox"/> Annual awareness programmes on Code of Conduct are organized <input type="checkbox"/> <p>Options:</p> <p>A. All of the above B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above</p> <p>Upload:</p> <ul style="list-style-type: none"> Code of ethics policy document Details of the monitoring committee composition and minutes of the committee meeting, number of programmes organized, reports on the various programs etc., in support of the claims. Any other relevant information 	5
7.1.11 Q _i M	<p><i>Institution celebrates / organizes national and international commemorative days, events and festivals</i></p>	5

	<p>Describe the efforts of the Institution in celebrating /organizing national and international commemorative days, events and festivals during the last five years within 500 words</p> <p>Provide weblink to :</p> <ul style="list-style-type: none"> • Annual report of the celebrations and commemorative events for the last five years • Geotagged photographs of some of the events • Any other relevant information 	
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Key Indicator - 7.2 Best Practices (30)

Metric No.	Weightage
7.2.1 QIM	<p>Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.</p> <p>Provide web link to:</p> <ul style="list-style-type: none"> • Best practices in the Institutional web site • Any other relevant information

Note: Information at University level

Format for Presentation of Best Practices

1. Title of the Practice

This title should capture the keywords that describe the practice.

2. Objectives of the Practice

What are the objectives / intended outcomes of this “best practice” and what are the underlying principles or concepts of this practice (in about 100 words)?

3. The Context

What were the contextual features or challenging issues that needed to be addressed in designing and implementing this practice (in about 150 words)?

4. The Practice

Describe the practice and its uniqueness in the context of India higher education. What were the constraints / limitations, if any, faced (in about 400 words)?

5. Evidence of Success

Provide evidence of success such as performance against targets and benchmarks, review/results. What do these results indicate? Describe in about 200 words.

6. Problems Encountered and Resources Required

Please identify the problems encountered and resources required to implement the practice (in about 150 words).

7. Notes (Optional)

Please add any other information that may be relevant for adopting/ implementing the Best Practice in other Institutions (in about 150 words).

Any other information regarding Institutional Values and Best Practices which the university would like to include.

Key Indicator - 7.3 Institutional Distinctiveness (20)

Metric No.		Weightage
7.3.1 QIM	<p><i>Portray the performance of the Institution in one area distinctive to its priority and thrust within 1000 words</i></p> <p>Provide web link to:</p> <ul style="list-style-type: none"> • Appropriate web in the Institutional website • Any other relevant information 	20

5. Evaluative Report of the Departments

Name of the University..... Name of the Department...Information Technology.....

Dist.....

State...Uttarakhand.....

Total Number of Departments in the institution.....

Sl. No.	Name of the Department	Information Technology
1.	Year of Establishment	2000
2.	Is the Department part of a School/Faculty of the University	Yes
3.	Names of programmes offered	UG-Information Technology Master's in Information Technology PGDCA Bachelors' in Information Technology
4.	Number of teaching posts Sanctioned/Filled	Nil/01
5.	Number of Research Projects: Total grants received	Nil

6.	Inter –institutional collaborative projects and Associated grants received	
	National collaboration	Nil
	International collaboration	Nil
7.	Departmental projects funded by DST-FIST, UGC-SAP/CAS,DPE, DBT, ICSSR, AICTE etc., : Total grants received	Nil
8.	Special research laboratories sponsored by / created by industry or corporate bodies	Nil
9.	Publications:	
	Number of Papers published	03
	Number of Books with ISBN	
	Number of Citation Index – range / average	
	Number of Impact Factor – range / average	
	Number of h-index	
10.	Details of patents and income generated	Nil
11.	Areas of consultancy and income generated	Nil
12.	Awards/Recognitions received at the National and International level by :	
	Faculty	
	Doctoral/Post doctoral fellows	01- young scientist award at UCOST 2016-17
	Students	
13.	How many students have cleared Civil Services and Defense Services examinations, NET, SET (SLET), GATE and other competitive examinations	01
14.	List of doctoral, post-doctoral students and research associates	
	From the host institution/university	
	From other institutions/universities	RK Singh Sanjeev Bora Pawan kumar Pant
15.	Number of Research Scholars/ Post Graduate students getting financial assistance from the University/State/ Central	nil

6. Data Templates / Documents

(Quantitative Metrics)

The online formats (Templates) for submitting data with respect to Quantitative Metrics (Q_nM) are given in consecutive pages.

Kindly Note:

For each Quantitative Metric the kinds of data to be uploaded are indicated in tabular form and/ or documents required are listed.

- Documents such as minutes of meeting, decisions, statements of accounts, award letters, letters of appointments, etc., need to be uploaded as required; wherever these are in bulk, hyperlinks to the appropriate website be given.
- There could be some variation in the metrics from the QIF; this is due to rendering it to the IT format for online submission.
- The list of documents to be uploaded is only suggestive. If the Institution has any other relevant documents to substantiate its claims, the same may also be uploaded.

Data Templates / Documents - Quantitative Metrics (Q_nM)

Sl. NO.	Criterion I – Curricular Aspects (150)							
	Key Indicator - 1.1 Curriculum Design and Development (50)							
1.	1.1.2 Percentage of Programmes where syllabus revision was carried out during the last five years (20)							
	1.2.2 Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (20)							
	Program me Code	Programm e name	Year of Introduc tion	Status of implementati on of CBCS / elective course system (Yes/No)	Year of implementation of CBCS / elective course system	Year of revision (if any)	If revision has been carried out in the syllabus during last 5 years, Percentage of content added or replaced	Link to the relevant document
					Nil			

2.	1.1.3 Average percentage of courses having focus on employability/ entrepreneurship/ skill development during the last five years (10)						
	1.2.1 Percentage of new courses introduced of the total number of courses across all programmes offered during the last five years (30)						
	Name of the Course	Course Code	Year of introduction	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Link to the relevant document
	BVoc in Desktop Publishing, 2015-16						

	Key Indicator - 1.3 Curriculum Enrichment (30)						
3.	1.3.2 Number of value-added courses for imparting transferable and life skills offered during last five years (10)						
	1.3.3 Average Percentage of students enrolled in the courses under 1.3.2 above (10)						

Year 1						
Name of the value added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in the year	Number of Students completing the course in the year
Nil						
Year 2						
Name of the value added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in the year	Number of Students completing the course in the year
Nil						
Year 3						
Name of the value added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in the year	Number of Students completing the course in the year
Nil						
Year 4						
Name of the value added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in	Number of Students completing the

					the year	course in the year
Nil						
Year 5						
Name of the value added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in the year	Number of Students completing the course in the year
Nil						

4.	1.3.4 Percentage of students undertaking field projects / research projects / internships (Data for the latest completed academic year)(5)					
	1.3.4.1: Number of students undertaking field project or research projects or internships					
	Programme name	Program Code	List of students undertaking field projects /research projects / internships			Link to the relevant document
MIT		Year 2016 Ajay Pande Aarti Rawat Deepak Singh Bhandari Meenakshi Joshi Neeraj Kalakoti Year 2017 Ankita Joshi Kailash Chandra Bhatt Shubham Pant				

* To check with SOP if the same student can be counted more than once

Key Indicator - 1.4 Feedback System (20)

5. 1.4.1 Structured feedback for design and review of syllabus – semester wise / year wise is received from 1) Students, 2) Teachers, 3) Employers, 4) Alumni (10)

Options:

A. Any 4 of above

B. Any 3 of above

C. Any 2 of above

D. Any 1 of above

E. None of the above

1.4.2 Feedback processes of the institution may be classified as follows: (10)

A. Feedback collected, analysed and action taken and feedback available on website

B. Feedback collected, analysed and action has been taken

C. Feedback collected and analysed

D. Feedback collected

E. Feedback not collected

URL for feedback collection and analysis reports

Information at University level

Criterion II -Teaching-Learning and Evaluation (200)

Key Indicator - 2.1 Student Enrolment and Profile (10)

6. 2.1.1 Demand Ratio (Average of Last five years) (5)

2.1.1.1: Number of seats available year wise during the last five years

Year 1

Programme name

Programme Code

Number of seats available/sanctioned

Number of eligible

Number of Students

			applications received	admitted
MIT		20	05	05
Year 2				
Programme name	Programme Code	Number of seats available/sanctioned	Number of eligible applications received	Number of Students admitted
MIT		20	05	05
Year 3				
Programme name	Programme Code	Number of seats available/sanctioned	Number of eligible applications received	Number of Students admitted
MIT		20	03	03
Year 4				
Programme name	Programme Code	Number of seats available/sanctioned	Number of eligible applications received	Number of Students admitted
			Nil	
Year 5				
Programme name	Programme Code	Number of seats available/sanctioned	Number of eligible applications	Number of Students admitted

				received	
				Nil	

7.	2.1.2 Average percentage of seats filled against seats reserved for various categories (SC, ST, OBC, Divyangjan, etc.) as per applicable reservation policy during the last five years. (Excluding Supernumerary Seats) (5)										
	2.1.2.1: Number of actual students admitted from the reserved categories year wise during the last five years										
		Number of seats earmarked for reserved category as per GOI or State Government rule					Number of students admitted from the reserved category				
	Year	SC	ST	OBC	Gen	Others	SC	ST	OBC	Gen	Others

* In case of Minority Institutions, the column Others may be used and the status of reservation for minorities specified along with supporting documents.

	Key Indicator - 2.4 Teacher Profile and Quality (50)	
8.	2.4.1 Average percentage of full time teachers against sanctioned posts during the last five years (15)	
	2.4.3 Average teaching experience of full time teachers in the same institution (Data for the latest completed academic year in number of years) (10)	

	Name of the Full-time teacher	PAN	Designation	Year of appointment	Nature of appointment (Against Sanctioned post, temporary, permanent)	Name of the Department	Total years of Experience in the same institution	Is the teacher still serving the institution/If not last year of the service of Faculty to the Institution
	Umang	Aybbs3439a	Assistant Professor	2010	permanent	Information Technology	10	yes
* Also to be used for verification of teacher data for metric 2.2.2 & 2.3.3								

9.	2.4.2 Average percentage of full time teachers with Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit. during the last five years (15)			
	Name of full time teacher with Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.	Qualification (Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’Lit.) and Year of obtaining	Whether recognised as research Guide for Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D’ Lit.	Year of Recognition as Research Guide
	Nil			

10.	2.4.4 Average percentage of full time teachers who received awards, recognition, fellowships at State, National, International level from Government/Govt. recognized bodies during the last five years (10)							
	3.4.2 The institution provides incentives to teachers who receive state, national and international recognitions/awards (5)							
	1.Commendation and monetary incentive at a University function 2.Commendation and medal at a University function 3. Certificate of honor 4.Announcement in the Newsletter / website							
	Name of full time teachers receiving awards from state	Year of Award	PAN	Designation	Name of the award, fellowship, received	Name of the Awarding Agency	Incentives/Type of the incentive	Link to the

	level,national level, international level				from Government or Government recognised bodies		given by the HEI in recognition of the award	relevant documents
	Nil							

Key Indicator - 2.5 Evaluation Process and Reforms (40)					
11.	2.5.1 Average number of days from the date of last semester-end/ year- end examination till the declaration of results during the last five years (15) 2.5.1.1: Number of days from the date of last semester-end/ year- end examination till the declaration of results year wise during the last five years				
	Programme Name	Programme Code	Semester/ year	Last date of the last semester-end/ year- end examination	Date of declaration of results of semester-end/ year- end examination
At University Level					

12.	2.5.4 Status of automation of Examination division along with approved Examination Manual (5) A. 100% automation of entire division & implementation of Examination Management System (EMS) B. Only student registration, Hall ticket issue & Result Processing C. Only student registration and result processing D. Only result processing E. Only manual methodology				
	100% automation of entire division & implementation of Examination Management	Student registration, Hall ticket issue & Result Processing are automated (Yes/No)	Student registration and result processing are automated (Yes/No)	Result processing is only automated (Yes/No)	Follow manual methods

System (EMS) (Yes/No)				(Yes/No)
Information at University level				

Key Indicator - 2.6 Student Performance and Learning Outcomes (30)								
13.	2.6.3 Pass percentage of Students (<i>Data for the latest completed academic year</i>) (10)							
	Program Code	Program Name			Number of students appeared in the final year examination	Number of students passed in final year examination		
At University level								
Key Indicator - 2.7 Student Satisfaction Survey (30)								
14.	2.7.1 Online student satisfaction survey regarding teaching learning process. (30)							
	Category	State of Domicile	Nationality if other than Indian	Email ID	Programme name	Student Unique Enrolment ID	Mobile Number	Year of joining
At university level								

Criterion III – Research, Innovations and Extension (250)
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15.	3.1.2 The institution provides seed money to its teachers for research (average per year INR in Lakhs) (3)			
	Name of the teacher provided with seed money	The amount of seed money	Year of receiving	Link to the policy document for Sanction of seed money / grants for research from the institution

16.	3.1.3 Percentage of teachers receiving national/ international fellowship/financial support by various agencies for advanced studies/ research during the last five years (3)			
	Name of the teacher awarded national/ international fellowship/financial support	Name of the award/fellowship	Year of Award	Awarding Agency
		Nil		

17.	3.1.4 Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other research fellows enrolled in the institution during the last five years (4)						
	Sl.No	Name of Research fellow	Year of enrolment	Duration of fellowship	Type of the fellowship	Granting agency	Qualifying exam if any (NET, GATE, etc.)
		Nil					
	At university level						

18.	3.1.6 Percentage of departments with UGC-SAP, CAS, DST-FIST, DBT, ICSSR and other recognitions by national and international agencies (Data for the latest completed academic year) (5)							
	3.2.1 Extramural funding for Research (Grants sponsored by the non-government sources such as industry, corporate houses, international bodies for research projects) endowments, Chairs in the University during the last five years (INR in Lakhs) (5)							
	3.2.2 Grants for research projects sponsored by the government agencies during the last five years (INR in Lakhs) (10)							
	3.2.3 Number of research projects per teacher funded by government and non-government agencies during the last five years (5)							
	Name of the Scheme/Project/ Endowments/ Chairs	Name of the Principal Investigator/ Co Investigator (if applicable)	Name of the Funding agency	Type (Government/Non-Government)	Department	Year of Award	Funds provided (INR in lakhs)	Duration of the project
		Nil						
	At University Level							

Key Indicator - 3.3 Innovation Ecosystem (30)						
19.	3.3.2 Number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR), entrepreneurship, skill development during the last five years (10) 3.3.2.1: Total number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR), entrepreneurship, skill development year wise during the last five years					
	Year	Name of the workshop/ seminar	Number of Participants	Date From – To	Link to the Activity report on the website	Date of establishment of IPR cell
		Nil				
At University Level						

20.	3.3.3 Number of awards / recognitions received for research/innovations by the institution/teachers/research scholars/students during the last five years (10) 3.3.3.1: Total number of awards / recognitions received for research/ innovations won by institution/teachers/research scholars/students year wise during the last five years				
	Title of the innovation	Name of the Awardee	Name of the Awarding Agency with contact details	Year of Award	Category- institution/teacher/research scholar/student
	Young Scientist award	Madhulata Kumari	UCOST	2016-17	Research Scholar

Key Indicator - 3.4 Research Publications and Awards (100)				
21.	3.4.3 Number of Patents published/awarded during the last five years (10) 3.4.3.1: Total number of Patents published/awarded year wise during the last five years			
	Name of the Patenter	Patent Number	Title of the patent	Year of Award of patent

Nil				

22.	3.4.4 Number of Ph.D.s awarded per teacher during the last five years (10)					
	Name of the PhD scholar	Name of the Department	Name of the guide/s	Title of the thesis	Year of registration of the scholar	Year of award of PhD
	Dr. BP Pande	Information Technology	Dr. HS Dhami	Analysis and applications of stemming and lemmatization approaches for improvement in information retrieval techniques	2011	2015
	Dr. Madhulata Kumari	Information Technology	Dr. Neeraj Tiwari	Application of machine learning techniques for modern drug discovery	2014	2018

23.	3.4.5 Number of research papers per teacher in the Journals notified on UGC website during the last five years (15)					
	3.4.5.1: Number of research papers in the Journals notified on UGC website during the last five years					
	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number
Mining and Analysis of Microsatellites in Human	Umang	Information Technology	Advances in Bioresearch	2020	2277-1573	Web of science indexed

Coronavirus Genomes using the in-house built Java Pipeline							

24.	3.4.6 Number of books and chapters in edited volumes published per teacher during the last five years (15) 3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five year										
	S l. N o.	Name of the teach er	Title of the book/cha pters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / Internation al	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
Nil											

25.	3.4.7 E-content is developed by teachers : (10) 1. For e-PG-Pathshala, 2. For CEC (Under Graduate), 3. For SWAYAM, 4. For other MOOCs platform, 5. For NPTEL/NMEICT/any other Government Initiatives 6. For Institutional LMS										
	4.3.5 Institution has the following Facilities for e-content development 1. Media centre 2. Audio visual centre, 3. Lecture Capturing System (LCS) 4. Mixing equipments and softwares for editing (5)										

Name of the teacher	Name of the module developed	Platform on which module is developed	Date of launching e content	Link to the relevant document and facility available in the institution	List of the e-content development facility available	Provide link to videos of the media centre and recording facility
Nil						

Key Indicator - 3.5 Consultancy (20)

26.	3.5.2 Revenue generated from consultancy and corporate training during the last five years (INR in Lakhs) (15)					
	3.5.2.1: Total amount generated from consultancy and corporate training year wise during the last five years (INR in lakhs)					
	Revenue generated from consultancy during the last five years					
	Name of the consultant	Name of consultancy project	Consulting/Sponsoring agency with contact details		Year	Revenue generated (INR in Lakhs)
		Nil				
Revenue generated from corporate training during the last five years						
Names of the teacher-consultants/corporate trainers	Title of the corporate training program	Agency seeking training with contact details		Year	Revenue generated (amount in rupees)	Number of trainees
Information at University level						

Key Indicator - 3.6 Extension Activities (40)
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27.	3.6.2 Number of awards received by the Institution, its teachers and students from Government /Government recognised bodies in recognition of
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the extension activities carried out during the last five years (10) 3.6.2.1: Total number of awards and recognition received for extension activities from Government / Government recognised bodies year wise during the last five years			
Name of the activity	Name of the Award/ recognition	Name of the Awarding government/ government recognised bodies	Year of award
Information at University level			

28.	3.6. 3 Number of extension and outreach programs conducted by the institution through NSS/NCC/Red cross/YRC etc. during the last five years (including Government initiated programs such as Swachh Bharat, Aids Awareness, Gender Issue, etc. and those organised in collaboration with industry, community and NGOs) (12)			
	3.6.4 Average percentage of students participating in extension activities listed at 3.6.3 above during the last five years (12)			
	Name of the activity	Organising unit/ agency/ collaborating agency	Name of the scheme	Year of the activity
				Number of students participated in such activities
Information at University level				

Key Indicator - 3.7 Collaboration (20)								
29.	3.7.1 Number of collaborative activities with other institutions/ research establishments/industry for research and academic development of faculty and students per year (10) 3.7.1.1: Total number of Collaborative activities with other institutions/ research establishment/industry for research and academic development of faculty and students year wise during the last five years							
	Sl. No .	Title of the collaborative activity	Name of the collaborating agency with contact details	Name of the participant	Year of collaboration	Duration	Nature of the activity	Link to the relevant document
Nil								

30.	3.7.2 Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years (10)				
	3.7.2.1: Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years				
	Organisation with which MoU is signed	Name of the institution/ industry	Year of signing MoU	Duration	List the actual activities under each MOU year wise
	Number of students/teachers participated under MoUs				
	Nil				
Criterion IV – Infrastructure and Learning Resources (100)					
Key Indicator - 4.1 Physical Facilities (30)					

31.	4.1.4 Average percentage of expenditure excluding salary for infrastructure augmentation during the last five years (INR in Lakhs) (10)				
	4.4.1 Average percentage expenditure incurred on maintenance of physical facilities and academic support facilities excluding salary component during the last five years (INR in lakhs) (10)				
	Year	Budget allocated for infrastructure augmentation	Expenditure for infrastructure augmentation	Total expenditure excluding Salary	Expenditure on maintenace of academic facilities (excluding salary for human resources)
					Expenditure on maintenance of physical facilities (excluding salary for human resources)
	Nil				

Key Indicator - 4.2 Library as a Learning Resource (20)					
32.	4.2.2 Institution has subscription for e-Library resources (6) Library has regular subscription for the following: 1. e – journals, 2. e-books, 3.e-ShodhSindhu, 4.Shodhganga, 5.Databases				

4.2.3 Average annual expenditure for purchase of books/ e-books and subscription to journals/e-journals during the last five years (INR in Lakhs) (5)

20000/- for books

Year 1

Library resources	If yes, details of memberships/subscriptions	Expenditure on subscription to e-journals, e-books (INR in lakhs)	Expenditure on subscription to other e-resources (INR in lakhs)	Total Library Expenditure	Link to the relevant document
Books				41000/-	
Journals				Nil	
e – journals				Nil	
e-books				Nil	
e-ShodhSindhu				Nil	
Shodhganga				Nil	
Databases				Nil	

Year 2

Library resources	If yes, details of memberships/subscriptions	Expenditure on subscription to	Expenditure on subscription to	Total Library Expenditure	Link to the relevant
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		e-journals, e-books (INR in lakhs)	other e-resources (INR in lakhs)		document
Books				15600/-	
Journals				Nil	
e – journals				Nil	
e-books				Nil	
e-ShodhSindhu				Nil	
Shodhganga				Nil	
Databases				Nil	
Year 3					
Library resources	If yes, details of memberships/subscriptions	Expenditure on subscription to e-journals, e-books (INR in lakhs)	Expenditure on subscription to other e-resources (INR in lakhs)	Total Library Expenditure	Link to the relevant document
Books				15600/-	
Journals				Nil	
e – journals				Nil	
e-books				Nil	
e-ShodhSindhu				Nil	
Shodhganga				Nil	

Databases				Nil	
Year 4					
Library resources	If yes, details of memberships/subscriptions	Expenditure on subscription to e-journals, e-books (INR in lakhs)	Expenditure on subscription to other e-resources (INR in lakhs)	Total Library Expenditure	Link to the relevant document
Books					
Journals				15,100/-	
e – journals				Nil	
e-books				Nil	
e-ShodhSindhu				Nil	
Shodhganga				Nil	
Databases				Nil	
Year 5					
Library resources	If yes, details of memberships/subscriptions	Expenditure on subscription to e-journals, e-books (INR in lakhs)	Expenditure on subscription to other e-resources (INR in lakhs)	Total Library Expenditure	Link to the relevant document
Books				10000/-	
Journals				Nil	
e – journals				Nil	

	e-books				Nil	
	e-ShodhSindhu				Nil	
	Shodhganga				Nil	
	Databases				Nil	

Key Indicator - 4.3 IT Infrastructure						
33.	4.3.1 Percentage of classrooms and seminar halls with ICT - enabled facilities such as LCD, smart board, Wi-Fi/LAN, audio video recording facilities (Data for the latest completed academic year) (5)					
	Room number or Name of classrooms/Seminar Hall with LCD / wifi/LAN facilities with room numbers	Type of ICT facility			Link to geo tagged photos and master time table	
	01 lab (only LCD)	LCD projector with 10 Computers				
	** (Data for the latest completed academic year)					

Criterion V - Student Support and Progression (100)						
Key Indicator - 5.1 Student Support (30)						
34.	5.1.1 Average percentage of students benefited by scholarships, freeships, etc. provided by the institution, Government and non-government agencies (NGOs) during the last five years(other than the students receiving scholarships under the government schemes for reserved categories) (10)					
	Year	Name of the scheme	Number of students benefited by government scheme	Number of students benefited by the institution's	Number of students benefited by the non-government agencies (NGOs) and amount	Link to relevant document

		and amount		schemes and amount					
		Number of students	Amount	Number of students	Amount	Number of students	Amount	Name of the NGO/agency	
Information to be provided at University level									

35.	5.1.2 Average percentage of students benefited by career counseling and guidance for competitive examinations offered by the Institution during the last five years (10)								
	Year	Name of the Activity conducted by the HEI to offer guidance for competitive examinations offered by the institution during the last five years		Name of the Activity conducted by the HEI to offer guidance for career counselling offered by the institution during the last five years		Number of students placed through campus placement	Link to the relevant document		
		Name of the Activity	Number of students attended / participated	Details of career counselling	Number of students attended / participated				
Information to be provided at University level									

Note: Please do not include individual university's entrance examination.

38.	5.2.2 Average percentage of placement of outgoing students during the last five years (15)				
	Year	Name of student placed and contact details	Program graduated from	Name of the employer with contact details	Pay package at appointment
	Nil				

39.	5.2.3 Percentage of recently graduated students who have progressed to higher education (previous graduating batch) (15)			
	Name of student enrolling into higher education	Program graduated from	Name of institution joined	Name of programme admitted to
	Information to be provided by Campus			

Key Indicator - 5.3 Student Participation and Activities (20)					
40.	5.3.1 Number of awards/medals won by students for outstanding performance in sports/cultural activities at inter-university/state/national/international events (award for a team event should be counted as one) during the last five years (10)				
	Year	Name of the award/ medal	Team / Individual	Inter-university / state / National / International	Name of the event

Information to be provided at University level						

41.	5.3.3 Average number of sports and cultural events / competitions organised by the Institution per year (5)					
	Date of event/competition(DD-MM-YYYY)			Name of the event/competition		
Information to be provided at University level						
Note: Classify the data and provide year wise						

Criterion VI – Governance, Leadership and Management (100)			
Key Indicator - 6.2 Strategy Development and Deployment (10)			
42.	6.2.3 Institution Implements e-governance in its areas of operations (5) 6.2.3.1 e-governance is implemented covering following areas of operation 1. Administration, 2. Finance and Accounts, 3. Student Admission and Support, 4. Examination		
	Areas of e governance	Year of implementation	Name of the Vendor with contact details
	Administration	Nil	
	Finance and Accounts	Nil	
	Student Admission and Support	Nil	
	Examination	Nil	
			Link to relevant website/ document

Key Indicator - 6.3 Faculty Empowerment Strategies (30)			
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43.	6.3.2 Average percentage of teachers provided with financial support to attend conferences / workshops and towards membership fee of professional bodies during the last five years (10)			
	Year	Name of teacher	Name of conference/ workshop attended for which financial support provided	Name of the professional body for which membership fee is provided
			Nil	Nil
				-

44.	6.3.3 Average number of professional development / administrative training programs organized by the institution for teaching and non teaching staff during the last five years (8)			
	Dates (from-to) (DD-MM-YYYY)	Title of the professional development program organized for teaching staff	Title of the administrative training program organised for non-teaching staff	No. of participants
	Information to be provided at University level			

45.	6.3.4 Average percentage of teachers undergoing online/ face-to-face Faculty Development Programmes (FDP)during the last five years (Professional Development Programmes, Orientation / Induction Programmes, Refresher Course, Short Term Course etc.,) (8)		
	Name of teacher who attended	Title of the program	Duration (from – to) (DD-MM-YYYY)
	Mrs. Umang	Refresher course in Computer Science, HRDC, University of Calicut	10.08.2016 to 30.08.2016 (face-to-face)
	Mrs. Umang	IDC Refresher course in Environment Science, HRDC, GJU Hisar	07-10-2019 to 19-10-2019 (face-to-face)
	Mrs. Umang	Pedagogical Innovations And Research Methodology (Interdisciplinary) HRDC, GJU Hisar	20-10-2019 to 31-01-2020 Four quadrant (online) Appeared in proctored exam on 16-02-2020

Key Indicator - 6.4 Financial Management and Resource Mobilization (20)							
46.	6.4.2 Funds / Grants received from government bodies during the last five years for development and maintenance of infrastructure (not covered under Criteria III and V) (INR in Lakhs) (8)						
	6.4.3 Funds / Grants received from non-government bodies, individuals, philanthropists during the last five years for development and maintenance of infrastructure (not covered under Criteria III and V) (INR in Lakhs) (6)						
Year	Name of the government funding agencies	Name of the non government funding agencies/ individuals	Purpose of the Grant	Funds/ Grants received (INR in lakhs)	Link to Audited Statement of Accounts reflecting the receipts		
None							
47.	6.5.2 Institution has adopted the following for Quality assurance (10) 1. Academic Administrative Audit (AAA) and follow up action taken 2.Confernces, Seminars, Workshops on quality conducted 3. Collaborative quality initiatives with other institution(s) 4.Orientation programme on quality issues for teachers and students 5. Participation in NIRF 6.Any other quality audit recognized by state, national or international agencies (ISO Certification, NBA)						
Year	Confernces, Seminars, Workshops on quality conducted	Academic Administrative Audit (AAA) and initiation of follow up action	Participation in NIRF along with Status.	ISO Certification. and nature and validity period	NBA or any other certification received with program specifications.	Collaborative quality initiatives with other institution(s) (Provide name of the institution and activity	Orientation programme on quality issues for teachers and students organised by the institution, Date (From-To) (DD-MM-YYYY)

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Information to be provided at University level

Declaration by the Head of the Institution

I certify that the data included in this Self-Study Report (SSR) are true to the best of my knowledge.

This SSR is prepared by the institution after internal discussions, and no part thereof has been outsourced.

I am aware that the Peer Team will validate the information provided in this SSR during the peer team visit.

Signature of the Head of the Department

with seal:

Place:

Date:

Music Department
Kumaun University
S.S.J. Campus, Almora
2020

Kumaun University Nainital has three campuses at Nainital, Almora and Bhimtal. In Nainital and Almora Campuses the music classes up to Post Graduation level are running. Almora Campus has only the Indian Classical Music (Vocal) classes where as in Nainital Campus the vocal music and instrumental (Sitar and Tabla) classes are running.

In Almora campus the classical music (Vocal) classes are running in semester mode since 2010, where as in undergraduate stage it started at a later date.

Vision : The department intends mainly to concentrate on northern classical music incorporating the Rag-Ragas of this region.

Mission : The university has been requested to start the instrumental courses (Tabla and Sitar) in Almora campus also.

Programme Educational Objectives: The music department intends to raise the level of the curriculum to such a height so that the students from other areas may come to seek admission in the course run by Kumaun University.

Programme Outcome: This can be evaluated, ones the new syllabus is implemented and the students completing the various programmes, get involved in high class performances.

Hindustani Classical Music (Vocal)

B.A. I Semester

Max Marks : 50

Theory Paper- I- Science of Music

Theory Paper : 35

Internal Assessment :15

Learning Outcomes - After the completing the course the students will have a knowledge of-

- Student's will be able to under stand the voice test of the lyrics and 'what is heard' in General. It is also an important concept of Indian music.
- Students will be able to know the status of twelve swar's on Veena told by Shree Nivas and Ahobal.
- Students will be able to understand the distance and difference between two swar's.

B.A. I Semester

Theory Paper-II- The Study of Ragas and Talas

Max Marks : 50

Theory Paper : 35

Internal Assessment :15

Learning Outcomes : After completing the course the students will have a knowledge of-

- Sudha chayalag and sankiran Raga's knowledge.
- Comparative study and understanding of different Raga's of syllabus.
- A practice of writing the notations of khyal of Ragas.
- The practice of writing the notations of Dhrupad and Dhamar with Layakarries.
- Practice of understanding the Taals of the syllabus and writing along with layakarries.
- The life sketch of famous musician's alongwith their contribution in music.

B.A. I Semester

Practical

Max Marks : 50

Learning Outcomes : After completing the course the students will have a practical knowledge of-

- The singing of Raag Bhairav, Yaman, Durga and Bhupali in Drut Khyal.
- The practice of singing the vilambit khyal of any Raag of the syllabus.
- Saragam geet and lakshan geet in any Raag of syllabus.
- The potential of singing in any Raag alongwith Dhrupad and Dhamar Laykarries.
- Practice of singing Bhajan and knowledge in teentaal and jhaptaal
- Viva-voce.

Hindustani Classical Music (Vocal)

B.A. II Semester

Max Marks : 50

Theory Paper-I -Science of Music

Theory Paper : 35

Internal Assessment :15

Learning Outcomes - After completing the course the students will have a knowledge of-

- Knowledge of Sambanta and Vimbanta.
- A brief knowledge of Gram, Jati Gayan, Murchna, Nyas, Sanyas, Vinyas and Swasthan Niyam.
- Writing an essay on different general topics of music.

B.A. II Semester

Theory Paper-II- The Study of Ragas and Talas

Max Marks : 50

Theory Paper-I- Science of Music

Theory Paper : 35

Internal Assessment :15

Learning Outcomes : After completing the course the students will have-

- A knowledge of Geet, Gandharv, Gaan, Desi and Margi Sangeet.
- A brief knowledge of different Ragas of syllabus. Knowledge of saragama geet and lakshan geet and to differentiate between different Ragas on the basis of Alap's
- Writing alongwith notation of different Raag's of the syllabus. (For example : khyal (Drut and vilambit), Dhrupad and Dhamar)
- Writing in Dugun, Tigun and Chougun Layakaries of Chartal and Tilwara Taal.
- The life sketch of famous musicians alongwith their contribution in music.

B.A. II Semester

Practical

Max Marks : 50

Learning Outcomes : After completing the course the students will have a practical knowledge of-

- The singing of Raag Allahya, Bilawal, Brindawani and Sarang, Kafi and Vihag.
- The practice of singing the vilambit khyal of any Raag of the syllabus.
- Saragam geet and lakshan geet in any Raag of syllabus.
- The potential of singing in any Raag alongwith Dhrupad and Dhamar Laykaries.
- Practice of singing Tarana in any Raag of syllabus and knowledge of teentaal and jhaptaal
- Viva-voce.

Hindustani Classical Music (Vocal)

BA-III Semester

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Theory Paper-I- Science of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- A comparative study of notation system of Bhatkhande and Vishnu Digamber. Brief history of Indian classical music of ancient and Mediaeval period.
- Comparative study of swar's and Taals of Indian music of North India and South India.

BA-III Semester

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Theory Paper-II- The study of Ragas and Talas

Learning Outcomes - After completing the course the students will have a deep knowledge of-

- Nibandh, Gaan, Anibadh Gaan, Ragalaap, Rupkalap, Alaptigaan Alptva-Bahutva and Trivat.
- Detailed study of the classification of Raag.
- A brief knowledge of different Raga's of syllabus.
- **Knowledge of saragama geet and lakhsan geet and to differentiate between different Raga's on the basis.**
- Writing along with notation of different Raag of syllabus. (for example : Khyal, (Vilambit & Drut), Dhrupad and Damar with laykaries.
- Writing in Dugun, Tigun and Chaugun laykaries of Kaharwa taal and Rupak taal.
- **Life sketch and the contribution of Pt. Vishnu Digamber Paluskar and Taansen in music.**

B.A. III Semester

Practical

Marks : 50

Learning Outcomes - After completing the course the students will have a practical knowledge of-

- The singing of Raag Desh, Bheempalasi, Khamaj and Bhairvi.
- The practice of singing the Vilambit Khyal of any Raag of the syllabus.
- Saregama Geet and Lakshan Geet in any Raag of syllabus.
- The potential of singing in any Raag along with Dhrupad and Dhamar Laykaries.
- Practice of singing Bhajan in any Raag of syllabus and knowledge of Kaharwa Taal and Rupak.
- Viva-Voce.

Hindustani Classical Music (Vocal)

BA-IV Semester

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Theory Paper-I- Science of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- Differentiating between Harmoni and Melody and a practice of writing the brief essay on topics of music.
- The detailed study of singing styles of Dhrupad, Dhamar Khyal, Tappa and Thumri Gayan.

B.A. IV Semester

Theory paper - II The study of Ragas and Talas

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Learning Outcomes - After completing the course the students will have a knowledge of-

- **Aavirabhav-Tirabhav, Swasthan Niyam, Aalaps Mordern Alap Gayan, Tarana and Chaturang.**
- A comparative and detailed study of Raag Kamod, Vibhas, deshkar and Bageshree giving complete specifications.
- Saregama Geet and Lakshan Geet in any two Raag of syllabus.
- Writing along with notation of different Raga's of syllabus for example khyal (Vilambit and Drut), Dhrupad and Dhamar with Layakaries.
- Writing in Dugun, Tigun and Chaugun of Taal Dhamar and Sultaal.
- Life sketch and the contribution in music of Pt. Omkarnath Thakur and Bheemsen Joshi.

B.A. IV Semester

Practical

Marks : 50

Learning Outcomes - After completing the course the students will have a Practical knowledge of-

- The singing of Raag Kamod, Vibhas, Deshkar and Bageshree.
- The practice of singing the Vilambit Khyal of any Raag of the syllabus.
- Saregama Geet and Lakshan Geet in any Raag of syllabus.
- The potential of singing in any Raag along with Dhrupad and Dhamar Laykaries.
- Practice of singing Tarana in any Raag of syllabus and knowledge of Dhamar Taal and Sultaal.

Hindustani Classical Music (Vocal)

BA-V Semester

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Theory Paper-I- Science of Music

Learning Outcomes - After completing the course the students will have a deep knowledge of-

- The detailed study of Modern Indian music and the contribution of musicians of that period.
- Brief study of different Gharanas.
- A general knowledge of the notations of western music.

B.A. V Semester

Theory paper- II- The study of Ragas and Talas

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Learning Outcomes - After completing the course the students will have a knowledge of-

- Nayak, Gayak, Gandhava, Pandit, Sangeet Shastrakar
- Complete details of Raga's of syllabus.
- Saregama Geet and Lakshan Geet in any two Raag's of syllabus.
- The potential of singing in any Raag alongwith Dhrupad and Dhamar Laykaries.
- Practice of singing Bhajan in any Raag of syllabus and knowledge of Aada chartaal and Deepchandi Taal.
- Life sketch and the contribution in music of Pt. Sharang Dev and Acharya Kalash Chandra Dev Brahaspati.

B.A. V Semester

Practical

Marks : 50

Learning Outcomes - After completing the course the students will have a practical knowledge of-

- The singing of Raag Malkauns, Jai-jaiwanti, Kedar and Jaunpuri.
- The practice of singing the Vilambit Khyal of any Raag of the syllabus.
- Saregama Geet and Lakshan Geet in any Raag of syllabus.
- The potential of singing in any Raag along with Dhrupad and Dhamar with Laykaries.
- Practice of singing Tarana in any Raag of syllabus and knowledge of Aada Chartaal and Deepchandi.

Hindustani Classical Music (Vocal)

BA-VI Semester

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Theory Paper-I- Science of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- Definition of Time Signature, Scale, Swar-Saptak and Chord of western music.
- A study of musical and non-musical sounds of Indian music.
- Practice and writing a brief essay on any subject related with music.
- Detailed study of the Prabandh shailly.

B.A. VI Semester

Theory paper- II- The study of Ragas and Talas

Max Marks : 50

Theory Paper : 35

Internal Assessment : 15

Learning Outcomes - After completing the course the students will have a knowledge of-

- Music teacher, Kabbal Vagyaykar, Khamsa and Lavni.
- A detailed and complete study with specifications of the ragas of the syllabus.
- The ability of understanding and differentiating between Ragas on the basis of Alapas.
- Writing with Khyal notations of Raags of syllabus along with Taan and Boltan.
- Writing the notations of Dhrupad and Dhamar in dugun, Tigun and Chougun laykaries.
- Writing the Dugun Tigun and Chagun of Taal Punjabi and Jhumra.
- Life sketch and the contribution in music of Ustad Karim Khan, Ustad Faiyaz Khan and Amir Khan.

B.A. VI Semester

Practical

Marks : 50

Learning Outcomes - After completing the course the students will have a practical knowledge of-

- The singing of Raag Miya Malhar, Darbari Kanda, Gaur Sarang and Miya ki Todi.
- The practice of singing the Vilambit Khyal of any Raag of the syllabus.
- Saregama Geet and Lakshan Geet in any Raag of syllabus.
- The potential of singing in any Raag along with Dhrupad and Dhamar with Laykaries.
- Practice of singing Tarana in any Raag of syllabus and knowledge of Punjabi and Jhumra Taal.
- Viva-Voce.

Hindustani Classical Music (Vocal)

M.A.-I Semester

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Theory Paper-I Applied Theory of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- A theoretical study of Ragas prescribed for practical purpose of M.A. I Semester.
- Composing and writing notation of given piece of verse in the ragas prescribed in practical paper II.
- Writing of Boltaan, Taans, Muktalaps in the ragas.
- A knowledge of classification of Ragas and their intensive study.
- Writing in Dhrupad, Dhamar and Khyal.

Theory Paper- II- General Theory of Music

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Learning Outcomes - After completing the course the students will have a knowledge of-

- Writing an essay of not more than 500 words on any topic related with music.
- Life sketch and the contribution to music of musicians mentioned in syllabus.
- A knowledge of voice culture.

Practical

- Two practical (Practical I&II) of 100 marks each of syllabus to have a knowledge of different Ragas (Example Raag Shyam, Kalyan, Nand, Maruvihag, Vihag, Bageshree etc.).

Hindustani Classical Music (Vocal)

M.A.-II Semester

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Theory Paper-I- Applied Theory of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- A theoretical study of Ragas prescribed for practical purpose of M.A. II Semester.
- Composing and writing notation of given piece of verse in the raga's prescribed in practical paper I.
- Writing of Boltaan, Taans, Muktalaps in the ragas.
- Classification of Ragas and their intensive study.
- Writing in notations Dhrupad, Dhamar and Khyal etc.

Theory Paper- II- General Theory of Music

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Learning Outcomes - After completing the course the students will have a knowledge of-

- Aesthetics of music and emotional expressions through music.
- Music from vedic period to modern time- brief cultural history of India.
- Ancient Musicology- A knowledge of Natya Shastra, Sangeet Ratnakar and Brihadeshi
- Music of Ramayan Mahabharat & Puran's

Practical

- Two practical (Practical I & II) of 100 marks each of syllabus to have a knowledge of different Ragas (Example : Ahir Bhairav, Bairagi, Sudha Sarang, Devgiri, Bilawal & Yamani Bilawal, etc.).

Hindustani Classical Music (Vocal)

M.A.-III Semester

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Theory Paper-I- Applied Theory of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- A theoretical study of Ragas prescribed for practical purpose of M.A. III Semester.
- Writing of Boltaan, Taans, Muktalaps in the ragas.
- Classification of Ragas and their intensive study.
- Writing in notations Dhrupad, Dhamar and Khyal etc.

Theory Paper- II- General Theory of Music

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Learning Outcomes - After completing the course the students will have a knowledge of-

- With specific reference to swar, raga and taal- comparative study of Hindustani and Karnatak Music.
- Study of Prabandh, Jati Gayan and Raag Gayan.
- Shruti, Gram and Moorchhana- An explanation.
- Study of Taals.

Practical

- Two practical (Practical I & II) of 100 marks each of syllabus to have a knowledge of different Ragas (Example : Raag Bilaskhani Todi, Gurjri Todi, Kaunsi Kanada, Miya Malhar and Gaur Malhar etc.).

Hindustani Classical Music (Vocal)

M.A.-IV Semester

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Theory Paper-I- Applied Theory of Music

Learning Outcomes - After completing the course the students will have a knowledge of-

- A theoretical study of Ragas prescribed for practical purpose of M.A. IV Semester.
- Writing of Boltaan, Taans, Muktalaps in the ragas.
- Classification of Ragas and their intensive study.
- Writing in notations Dhrupad, Dhamar and Khyal etc.

Theory Paper- II- General Theory of Music

Max Marks : 100

Theory Paper : 75

Internal Assessment : 25

Learning Outcomes - After completing the course the students will have a knowledge of-

- Study of Gharana's of Khyal Gayaki.
- Historical background of Khyal, Dhrupad, Dhamar, Thumri, Dadra and Tappa.
- A detail study of Kumaoni Holi.
- Research methodology in Music (Meaning, areas, sources)

Practical

- Two practical (Practical I & II) of 100 marks each. In the practical work the students will be asked to give a stage performance and to submit Project Report (100 marks) from topics allotted to them.

Kumaun University

Master of Arts (Political Science)

Programme Educational Objectives;

Following the ethos of Kumaun University which aims to materialize the ethos of nation building and leadership qualities through education, this Programme develops ethical values through practical, moral and intellectual aspects of education, the ability to understand & appreciate human diversity and to engage in community life as active citizens.

This programme also enhances the knowledge and creates the research aptitude about political phenomena of local to global context. The main objectives of the programme are: To acquaint students with contemporary political theory and issues in Indian political system. To develop insights of alternative moral and ethical frameworks for interpreting contemporary political discourse.

To apply disciplinary or interdisciplinary learning across multiple contexts, integrating knowledge and practices. To develop an exciting and supportive learning environment that is conducive to high quality research and related learning activities including debates, seminars and lectures.

To develop a set of core skills in students to work with efficiency in the areas of teacher education, technology of teaching, educational administration and supervision.

To increase awareness of career options available in the public and private sectors with postgraduate degree in political science. Also to make aware about its value as entry in Politics, administrative services, teaching positions, legal education and various other fields.

Programme Outcomes;

After completion to the M. A, Programme in Political Science, students will be able to:

PO1: Knowledge of Political Realm: Understand the fundamentals theories, political process and issues of national and international politics, including the political process in India. Effectively apply comparative, critical and analytical skills in reading and writing to address significant issues of the political world.

PO2: Interdisciplinary Perspective: Understand interdisciplinary perspective to the study of social sciences. Evaluate diverse point of views embedded within various frameworks which may include temporal, cultural, linguistic, socio-political or technological contexts.

PO3: Analytical Perspective: Demonstrate critical thinking, including the ability to form an argument, detect fallacies and evidence about key issues of politics and thoughtful and well-articulated presentations on specific field.

PO4: Technical Skills: Acquire the ability and the knowledge about use of electronic devices and traditional resources to study the key issues i.e. local, state, national and international policy. Use the applications of computer for data analysis and power point presentations to explain the research findings.

PO5: Problem Solving: acquaint with the idea of rational and analytical thinking and Conduct research in political areas. Also able to apply political science knowledge and skills to avoid crisis situations and solving actual problems when occur.

PO6: Communication Skills: Able to interact with diverse population of formal or informal arena; grasp their view point while dealing with socio-political issues and communicate effectively in both oral and written presentations and public speaking also.

PO7: Leadership and Management Abilities: Demonstrate the quality to lead a team, country and format or an informal organization. The capacity to perform duties, effective planning and management, ability to interact effectively with people and also indentifying and setting achievable goals, developing necessary strategies and outlining the tasks and schedules on how to achieve the set goals.

PO8: Teaching Abilities: acquaint with teaching skills for higher education. Also demonstrate their teaching skills through practice teaching.

PO9: Community Service: Participate as a civically member of society and provide community service.

PO10: Ethical Understanding: Develop and apply ethical considerations in professional, personal and social life and also recognize cultural and personal variability in lifestyle.

PO11: *Professional Identity*: Understand and perform their professional roles in state and society, such as political leader, educationalist and political analysts, Social Worker, Public Relations Assistant and Campaign Staffer and so on.

PO12: *Environment and Sustainability*: disseminate the knowledge and demonstrate the role for the promotion of environmental sustainability, Understand the comprehensive systemic analysis across both physical and behavioral dimensions society, the environment, and the economy.

PO13: *Life-Long Learning*: Understand the theory and practice of politics. Engage in dialogue over political concerns and life-long learning to participate in political process. Also contribute towards positive change in the society.

Kumaun University

Master of Arts (Political Science)

Curriculum Structure

First Semester	Examination, December
Second Semester	Examination, April/May
Third Semester	Examination, December
Fourth Semester	Examination, April/May

Political Science

First Semester

Paper 1	Western Political Thought (From Plato to Bodin)
Paper 2	Comparative Politics
Paper 3	Public Administration
Paper 4	Indian Political System

Western Political Thought (5101)

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the Main Features of Classical Greek Philosophy in general and Political Philosophy from Plato to Bodin in particular.

Comprehend the ideas on state, people, Justice, communism, education, constitution, Liberty, Rights etc.

Analyze and justify the relevance of Ideas of those thinkers in modern era.

Comparative Politics (5102)

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the basic concepts and approaches of Comparative Politics.

Critically evaluate the problems and relevance of Comparative Politics.

Analyze contemporary issues and challenges before the state and Constitutionalism from the comparative Perspective.

Public Administration (5103)

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand about theory and practice of Public Administration.

Work with people and manage them.

Learn about leadership skills, motivation and decision making.

Aware about working of Public Administration.

Indian Political System (5104)

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand about constitutional Development in India.

Institutions of governance in India.

Learn about leadership and decision making process in India.

Aware about working of Administration in India.

MA (Political Science) Second Semester

- Paper 1 Western Political Thought (From Hobbes to Marx)**
- Paper 2 Indian Political Dynamics**
- Paper 3 International Politics**
- Paper 4 State Politics in India (With special reference to U.K.)**

Western Political Thought (5201)

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the diverse intellectual political traditions in the west.

Aware about conceptual debate of fundamental political ideas in the west.

Critically analyze the political philosophy of western political thinkers.

Indian Political Dynamics (5202)

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand about the constitutional institutions of Indian Political System.

Comprehend the dynamics of Indian Political System.

Analyze the working of Indian Political System.

International Politics (5203)**Max. Marks : 75 (INT: 20 + EXT: 55)****Learning Outcomes:**

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

Critically analyze the theories of international politics.

Evaluate the concept of power and its changing nature.

Explore the instruments for the promotion of national interest.

Understand about various dimensions and emerging issues of international politics

State Politics in India (With special reference to U.K.) (5204)**Max. Marks : 75 (INT: 20 + EXT: 55)****Learning Outcomes:**

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

Understand the basic structure of federal system and the emerging trends of state politics in India.

Know about political process in Uttarakhand.

Critically analyze the Issues and challenges of U.K. state.

MA (Political Science) Third Semester

Paper 1 Indian Political Thought

Paper 2 Indian Administration

Paper 3 Political Ideology

Paper 4 (a) India in World Affairs (or)

Paper 4 (b) Local Self Government

Paper 4 (c) Environmentalism

Indian Political Thought (6101)

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Demonstrate and familiarize with main ideas of the key Indian Political Thinkers.

Analyze and compare the ideas and theories of Modern India Political Thinkers.

Aware about the relevance of Ancient and Modern Indian Political Thought in present era.

Indian Administration (6102)

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Know about evolution and development of Indian Administration.

Analyze the working of Indian Administration.

Aware about the administrative problems and reforms in India.

Political Ideology (6103)

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand key concepts, approaches and main problems of political Ideologies.

To think analytically on the concepts and issues involved in political ideology.

To explicate their own views in political ideology.

Develop ability to research current political issues and relate them to the course material.

India in World Affairs

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the India's security concerns and India's policy towards world politics.

Analyze the India's engagement towards world.

Awareness about the impact of New World Order and recent trends in post covid world.

Local Self-Government

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the basic structure of Panchayati Raj and the emerging trends of local politics in India.

Know about political process in local self-government.

Critically analyze the Issues and challenges of local self-government in U.K. state.

Environmentalism

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand key concepts, approaches and main problems of Green Politics.

To think analytically on the concepts and issues involved in environmentalism.

To explicate their own views in protection of environment.

Develop ability to research current climatic issues and relate them to the course material.

MA (Political Science) Fourth Semester

- Paper 1 Contemporary Political Philosophy**
- Paper 2 Political Thought (From Lenin to Rawls)**
- Paper 3 Post-Cold War International Relations**
- Paper 4 (a) Human Rights (or)**
- Paper 4 (b) International Organisations (or)**
- Paper 4 (c) Research Methodology**
- Paper 5 Viva-Voce**

Contemporary Political Philosophy

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Know and discuss the central themes, concepts and ideas on the development of the contemporary political Philosophy.

Understand and assess the structure and significance of particular texts produced within this tradition and be able to illustrate problems involved in their interpretation.

Address a number of key questions in political theory with reference to texts and arguments introduced in the course.

Political Thought (From Lenin to Rawls)

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the development of Post Marxist ideology.

Know and discuss the central themes, concepts and ideas on the development of the contemporary tradition of western political thought.

Analyze the ideology in terms of empirical realism.

Apply these ideologies to the assessment of some current economic debate.

Post-Cold War International Relations

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand about various dimensions and emerging issues of international politics in post-cold war era.

Understand the concept and perspective of Globalization and global economy.

Aware about contemporary Global Issues like ecological issues.

Critically analyze the trends and issues of Global politics.

Analyze the global institution, issues and challenges.

Human Rights

Max. Marks : 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the issues concerning the rights of citizens in general and the marginalized groups in particular.

Understand basic conceptual framework of Human Rights.

Assess the institutional and policy measures which have been taken in response to the demands of various movements.

Analyze conceptual dimensions, international trends and the Indian experience.

International Organisations

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Understand the working of international organizations and regional organizations.

Aware about the global challenges.

Analyze the role of U.N. and regional organizations.

Paper 4 (c) Research Methodology

Max. Marks: 75 (INT: 20 + EXT: 55)

Learning Outcomes:

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

Engage in a systematic study of both theoretical and practical aspects of Political Science equipped with strong methodological training.

Acquaint with the qualitative and quantitative research techniques for conducting field based research studies including selection of research problems, sampling and preparation of research tools and adoption of statistical methodologies.

Analyze the primary and secondary sources of research area in Political Science.

Build capability applying the knowledge of research techniques in writing the research papers.

Paper 5 Viva-Voce

Max. Marks : 100

Learning Outcomes:

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

Develop their presentation skills.

Interact with diverse population of formal or informal arena;

Grasp their view point while dealing with socio-political issues and communicate effectively in both oral and written presentations and public speaking also.

Department of English, Kumaun University Nainital

PROGRAMME OUTCOME

The main programme outcomes of M. A. in English are:

1. Students shall be able to read, interpret, understand and write about a diverse range of texts in English analytically and critically
2. Students shall be able to analyze texts of a variety of literary genres in terms of style, figurative language and convention.
3. Students shall be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
4. Students shall be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
5. Students shall be able to ethically gather, understand, evaluate and synthesize information from a variety of written and web sources.
6. Students shall be able to understand the growth of literature in India in English translation from classical to modern times.
7. Students shall be able to use literature in English and Indian regional languages as a means of understanding and countering marginalization on the basis of region, class, caste, creed and gender.
8. Students shall be educated in both artistry and utility of English language through the study of literature and other contemporary forms of culture.
9. The course shall help the students in the development of intellectual flexibility, creativity and cultural literacy so that they may engage in life-long learning.
10. Students shall become good human beings as the course shall teach them the true philosophy of life.



Kumaun University, Faculty of Law, SSJ Campus Almora (Uttarakhand)

Bachelor of Laws LL.B. Three Year Course Curriculum Structure

Programme Educational Objectives

The programme consists of Discipline/Core courses. The core courses include LL. B. Three Year Professional Course. These courses are designed in such a way that they help students in achieving professional skill and their holistic personality. The comprehensive *Panchmukhi Shiksha* or Five-fold Education model of Faculty of Law, Kumaun University, SSJ Campus Almora, includes physical, intellectual, moral, professional and aesthetic dimensions of human existence. It intends to dissolve all seeming binaries of life so that the students of Faculty of Law can nurture a harmonious and holistic personality. It also develops a sense of ethical behavior, nationalism, appreciating Indian culture and ethos.

The main objectives of the programme are:

- To acquaint students with complex textures of Indian culture and ethos.
- To develop students' wide understanding of and on the major concepts, thoughts, and ideas of LL. B. Three Year Professional Course.
- To inculcate among students critical, creative, liberal, innovative, and scientific acumen.
- To engage students in self-reflexivity and lifelong learning.

- To help students in integrating different aspects of physical, practical, aesthetic, moral and intellectual dimensions of education to develop a holistic personality of each student.
- To nurture an effective citizen with a strong value base and ethics.
- To familiarize students with environmental contexts, inclusivity and sustainable development.
 - To acquaint the students with the multidimensional professional exposure and skills available in the government and private sector.

Programme Outcomes

PO1: Enrichment of Intellectual and Epistemic Tradition:

The programme develops students' wide understanding of and on the major concepts, thoughts, and ideas of international and national legal system of LL.B Three Year Professional Course. It also enriches their analytical, critical, creative faculties.

PO2: Inculcation of Planning Abilities:

The programme hones effective planning abilities including time management, resource management, delegation skills and organizational skills of students which may develop their leadership qualities. It also prepares students for implementing plans, organizing several cultural and academic activities, coordinating to meet deadlines.

PO3: Amelioration of Problem Solving Skills:

The programme prepares students to contextualize and to rationalize the principles of scientific enquiry, theoretical and philosophical thoughts, analytical and creative thinking for solving problems and making decision in the socio-pragmatic realities of life. These problem solving skills are instrumental in finding,

analyzing, evaluating and applying information systematically so that judicious decision could be made.

PO4: Appropriate Application of Methodological Tools:

The programme makes a candid attempt of familiarizing students with some relevant methodological tools which help them exploring the underlying ideas, thoughts, concepts and meanings of law. A text is embedded into a rich cultural, social, pragmatic, and political realities and the apposite application of those methodological tools may unravel the textual and contextual richness.

PO5: Development of Leadership and Soft Skills:

Human beings while negotiating with the socio-pragmatic realities face umpteen numbers of challenges which are related to human reactions, motivation, leadership, conflict resolution and team building. All these problems can be responded and resolved with the development of soft skills and the designed programme indeed aims to resolve them.

PO5: Formation of Professional Identity:

Education intends to develop not only the intellectual and epistemological textures of the inhabitants of the synchronic society but it also hones professionalism among the denizens. Education of the globalized as well as globalized era focuses on the formation of professional identity among professionals. Thus, the programme intends to develop professional identity among students.

PO6: Nurturing Ethics:

The vying competitiveness has developed a great sense of individuality, utilitarianism, and material competitiveness among students. They have impelled the people to ignore honesty, empathy, integrity, and ethical principles and therefore, people are not able to make any ethical interventions. The programme therefore intends to nurture ethics and *dharma* among the denizens of the world.

PO7: Developing Communicative Competence:

The programme intends to develop grammatical and communicative competence among students and make them aware of the nature, form and function of language. Language is not merely a medium to communicate but is more fundamental to the process of the formation of ideas, thoughts and concepts. The programme therefore nurtures listening, writing, speaking and reading skills of students which allow them to communicate effectively in textual, personal and interpersonal contexts so that the discursive practices may be enriched and the trajectory of knowledge may get strengthened.

PO8: The knowledge, knower and Society:

The programme disseminates the fact the conception and distribution of knowledge in any form seems meaningless unless it is seen functioning in a society which is defined by the existence of human beings. The benefit of the common mass is always at the centre of all social, cultural, political, technological, and scientific innovations. Thus, the programme intends to integrate knowledge, knower or the human beings and society so that a sustainable society can be developed.

PO9: Environment and Sustainability:

The unprecedented growth and development in the world on industry, technology, trade and commerce etc have damaged the balance between nature and culture, Environment, ecology and all natural resources have been exploited to such a level that many of them are exhausted. Looking at these miserable conditions, the programme intends to prepare students to respond to some major issues of environment and sustainability.

PO10: Lifelong Learning:

A culture is inseparably intertwined into the complexes of its intellectual tradition or the systems of knowledge. The intellectual tradition remains alive

when the people communicate and engage themselves with some discursive practices. These practices help one in the identification of some thrust areas on the basis of self-criticality and reflexivity that keep the process of lifelong learning alive and unseasonable. Thus, the programme develops a strong urge among students to strive on the path of lifelong learning.

Programme Educational Objective

LL.B. Three Year programme has been conceptualized with a vision of creating dedicated professionals who are well trained in legal studies. The Three year programme designed amidst the five-fold education model of Kumaun University, Faculty of Law, SSJ Campus, Almora (Uttarakhand) would comprise a unique mix of foundational, vocational and variety of disciplinary courses in field of Law to enable the students of diverse backgrounds to find a new perspective of life and play a leading role in administration of justice and upholding the ideals of the Indian Constitution in the promising time to come.

The main objectives of LL.B. programme are:

1. To provide holistic development of the students by providing a combination of technology and value based traditional education.
2. To present a wider perspective of law before students by focusing on law subjects.
3. To train women for the legal profession and to provide a centre where scholars might contribute to an understanding of law and participate creatively in its growth and improvement.
4. To demonstrate how the legal rules have developed, the reasons underlying them and to make them understand the nexus between legal and social history.
5. To inculcate the principles underlying the existing legal rules and to point the right road for future development and preparing the students to take up leadership roles especially in judicial services.

6. To acquaint students with the operative legal rules, both substantive and procedural and to equip them with adequate experience to apply these rules.
7. To equip the students with sufficient knowledge of the historical and sociological background of the country's legal system and to provide understanding of other legal systems of the world so that the students do not find themselves at a complete loss when it comes to adopting a comparative approach.
8. To develop ability amongst the students to participate in Moot Courts, Debates & discussions and Seminars with a good level of confidence and challenge the very premise of legal concepts and their applications.

Programme Outcomes

PO1: Knowledge:

The student will be able to understand the fundamentals and implications of various legal rules along with the intricacies involved in legal profession.

PO2: Planning abilities:

The student will be equipped with different legal abilities after the completion of the course by which they can deal with the different legal issues associated with the society and individuals.

PO3: Problem Analysis:

They will be able to apply legal principles in real life issues through the analytical skills which will be developed by analysis of case laws and critical understanding of statutory provisions.

PO4: Modern Tool Usage:

Case analysis, Moot Court exercises, Debates, Alternate Dispute Resolution methods, Internships *etc.* will be used to improve their argumentative and writing skills.

PO5: Leadership Skills:

Today legal education is getting redefined in terms of information technology, globalization, environment and start-ups; the focus of this programme is on developing professional leaders among women in consonance with value education imparted at Faculty of Law, SSJ Campus Almora with traditional as well as modern approach.

PO6: Professional Identity:

Legal profession is a noble profession and it is not limited to the technical knowledge of legal rules. The prescribed course will help in nurturing the students in a way so that they can meet the standards of different avenues opening in legal profession.

PO7: Ethics:

The learner will be imbued with the ethical standards of legal profession & the values nurtured at the Faculty of Law, Kumaun University, SSJ Campus Almora that are required for practical and impartial behaviour of a law graduate.

PO8: Communication:

Students will be able to express complex ideas effectively and accurately in every walk of life whether it is professional or social.

PO9: Local and Global Citizenship:

Students will be able to assess the way in which legislation and government policies are formed and influenced the social, economical and legal order in national as well as global context. They will be able to understand and empathise cultural differences and practices required to work effectively in multi-cultural environment.

PO10: Environment and sustainability:

Learners will involve in various co-curricular activities like Legal Aid Camps, regular Legal Aid Clinic at departmental as well as institutional level to

gain practical exposure that will help them in adapting the socioeconomic, legal and political environment.

PO11: Life Long Learning:

The habit of continuous learning & life-long useful practical skills developed and acquired through the course that will motivate the students for further researches in the field of law, performing different professional roles, ultimately for leading a successful life.

Detailed Syllabus

LL.B Ist Semester

Paper-I

LB 101

Law of Contract – I

Max. Marks : 100

Learning Outcomes:

- The students will be able to understand various general principles related to contract law.
- The students will be able to deal effectively with the various disputes related to contracts.

LL.B Ist Semester

Paper-II

LB- 102

Law of Torts, Motor Vehicle Act & Consumer Protection

Max. Marks : 100

Learning Outcomes:

- The students will be able to understand the fundamental principles of tortious liability.

- The students will understand the difference between the law of torts and other laws.
- The students will have a comprehensive understanding about the existing law on consumer protection in India.
- The students will be aware of the basic procedures for handling consumer dispute and issues on motor vehicle.
- The students will be able to appreciate the emerging questions and policy issues in consumer law and motor vehicle law for future research.

LL.B Ist Semester

Paper-III

LB- 103

Constitutional Law-I

Max. Marks : 100

Learning Outcomes:

- The student will able to understand the need for the constitution
- The student will able to explain the role of the constitution in a democratic society
- The student will able to list the key feature of the constitution
- The student will able to appreciate the fundamental right of the citizens of India.

LL.B Ist Semester

Paper-IV

LB- 104

Family Law-I (Hindu Law)

Max. Marks : 100

Learning Outcomes:

- The students will be able understand the vast discipline of Hindu Law and other Personal Laws.
- The students will be able understand the significance of Hindu Law and other Personal Laws.
- The students will be able get insight into various concepts of Hindu Law and other Personal Laws which will help in shaping their career as Judges, Lawyers, Academicians and Jurists.

LL.B Ist Semester

Paper-V

LB- 105

Criminal Law (IPC)

Max. Marks: 100

Learning Outcomes:

- The students will get familiar to the principles of criminal law.
- The students will be able to expose the range of mental states that constitutes mens-rea essential for committing crime.
- The students will get acquainted to the latest developments and changes in the field of criminal law.
- The students will get familiarize with the key concepts regarding crime and criminal law.
- The students will be able to learn various offences punishable under IPC.
- The students get acquainted to the latest developments and changes in the field of criminal law.

LL.B 2nd Semester

Paper-VI

LB- 201

Contract-II

Max. Marks: 100

Learning Outcomes:

- The students will be able to analyze the implications of a contractual arrangement falling under any of the discussed head of special contracts.
- The students will be able to determine the legality of the transactions and also the rights and duties of the parties thereto
- The students will be able to purposefully deal with the disputes arising out of such contractual arrangements.

LL.B 2nd Semester

Paper-VII

LB- 202

Muslim Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to understand the vast discipline of Muslim Law.
Understanding the significance of Muslim Law:
- The students will be able get insight into various concepts of Muslim Law which will help in shaping their career as Judges, Lawyers, Academicians and Jurists.

LL.B 2nd Semester

Paper-VIII

LB- 203

Constitutional Law-II

Max. Marks: 100

Learning Outcomes:

- The student will develop an understanding of Fundamental rights, directive principles and fundamental duties.
- The students will learn the reasonable restriction imposed on various organs of the state so far as the rights are being concerned.
- The students will be able to acquaint the scope and parameters of part III, part IV and part IV A of the Constitution.

**LL.B 2nd Semester
Paper-IX**

LB- 204

Public International Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to get in-depth knowledge of Public International Law.
- The students will be able to pursue careers in government agencies, international organisations, non-governmental organisation and the private law firms which are dealing in global legal issues.
- The students will be able to get theoretical knowledge and handle the complexity of drafting of various instruments which will encourage them to think creatively about the challenges within the Public International law.
- The students will be able to understand a system regulating interstate interactions.

LL.B 2nd Semester

Paper-X

LB- 205

Environmental Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to evaluate and formulate environmental law and policy.
- The students will be able to understand effectively the working of the Institutions relating to environment.
- The students will be able to develop ability to assess the social and ecological impacts of environmental law and policy.

LL.B 3rd Semester

Paper-XI

LB- 301

Jurisprudence

Max. Marks: 100

Learning Outcomes:

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

- Develop their intellectual skills by developing a critical understanding of law.
- Realize the great potential for interaction between legal philosophy and legal practices.
- Formulate what relevant questions to be asked when laws are being discussed or legal reforms are being proposed.
- Analyze the consequences of law and its administration on social welfare and may think about changes for the betterment of the superstructure of laws.
- The students will be able to resolve typical legal conflicts, select and interpret codes and other current legislation.
- The student not only will be able to use this skill in practice but will also be motivated to take up detailed historical studies on his own after the course.
- The logical analysis of legal concepts sharpens the logical technique of the students.
- They will be able to find the difference between enforcement of codes and cases.

LL.B 3rd Semester

Paper-XII

LB- 302

Administrative Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to analyse the advanced principles of administrative law, undertake self-directed legal research at primary level and evaluate complex legal information with a particular emphasis upon legislation.
- The students will be able to apply principles of Administrative law to complex legal problems.
- The students will be able to analyse the impact and operation of administrative law for government accountability
- The students will be made aware about the legal remedies under Administrative law.

LL.B 3rd Semester

Paper-XIII

LB- 303

Property Law (Transfer of Property Act & Easement Act)

Max. Marks: 100

Learning Outcomes:

- The students will be able to know how to apply knowledge and able to solve practical problems related to property.
- The students will be able to integrate theoretical knowledge and handle the complexity of drafting the various instruments of transfer of property.
- The students will possess, understand and develop their skill in property related issues and can establish them self in civil cases as their specific area.

LL.B 3rd Semester

Paper-XIV

LB- 304

Company Law

Max. Marks: 100

Learning Outcomes:

- Demonstrate comprehensive and accurate knowledge, understanding of those areas of company law identified in the indicative syllabus.
- Critically analyse complex problems in relation to regulation of companies, apply the legal principles studied to these problems, evaluate competing arguments or solutions and present well supported conclusions both orally and in writing.
- Form a critical judgment on areas of controversy within the topics studied.

LL.B 3rd Semester

Paper-XIV (a)

LB- 304 (a)

Law Relating to Crime against Women

Max. Marks: 100

Learning Outcomes:

- The students will be able to understand the socio-legal position of women and law relating to crime against women special provisions made for them.
- The students will be able to get the knowledge of efforts made for the betterment of women at national and International level.

LL.B 3rd Semester

Paper-XV

LB- 305

Practical Training: Professional Ethics, Accountancy for Lawyers and Bar-Bench Relations

Max. Marks: 60

Learning Outcomes:

- The students will demonstrate comprehensive and accurate knowledge and understanding of code of conduct required for Legal Profession.
- The students will be able to exhibit understanding of Lawyers in the whole process of administration of justice.
- The students will study the provisions of Advocates Act, Contempt of Courts Act & Rules of Bar Council.

LL.B 4th Semester

Paper-XVI

LB- 401

Civil Procedure Code

Max. Marks: 100

Learning Outcomes:

- To analyze, outline and assess the structure and purpose of the civil courts system as it presently operates.
- To assess the sources of procedural rules and practices in the Supreme Court. Assessment criteria.
- To analyze and evaluate the steps prior to litigation, the process of preparation for trial and the enforcement of judgments or orders and costs. • The students will be able to understand the practical aspects of Civil Procedure.
- The students will be able to research properly and cite Legal authorities, such as cases, statutes and secondary sources.
- The students will be able to understand the remedial procedure under the Civil Procedure.
- The students will get aware with the provisions related to Law of Limitation.

LL.B 4th Semester
Paper-XVII
LB- 402
Criminal Procedure Code

Max. Marks: 100

Learning Outcomes:

- The students will be made aware about constitution of Criminal Courts & requisites for institution of criminal proceedings.
- The students will be able to initiate various procedures for seeking justice in criminal cases.
- The students will be aware with the intricacies of trial proceedings.
- The concept of plea bargaining, double jeopardy etc under criminal justice system will be imbibed in the learner.
- The students will understand remedial measures under criminal justice system.

LL.B 4th Semester
Paper-XVIII
LB- 403
Law of Evidence

Max. Marks: 100

Learning Outcomes:

- The student will be able to analyse and define the concept and general nature of evidence, and illustrate the different types of evidence and court procedures relating to evidence.
- The student will be able to determine and analyse the standard of proof and burden of proof in civil and criminal cases, and specify types of presumptions.

- The student will be able to understand rules governing examination in chief, cross examination and re-examination, and establish the procedures in civil or criminal trial.

LL.B 4th Semester

Paper-XIX

LB- 404

Offence against Child & Juvenile Justice

Max. Marks: 100

Learning Outcomes:

- **The course would expose the student to the criminal laws relating to child.**
- **The students will understand the constitutional and statutory protection available to the child under civil and criminal law.**
- **The students will understand the international humanitarian law for the protection of child.**

LL.B 4th Semester

Paper-XX

LB- 405

Alternative Disputes Resolution

Max. Marks: 100

Learning Outcomes:

- The students will be able to understand various methods of resolving disputes under ADR system.
- The students will develop understanding of participants' negotiating behavior
- The students will be able to use such processes to advance the interests of clients.

LL.B 5th Semester

Paper-XXI
LB- 501
Labour Law-I

Max. Marks: 100

Learning Outcomes:

- The students will be able to define the provisions of Constitutional Safeguards on Social Security & Labour Welfare.
- The students will be aware about the Trade Unions Act, 1926, Industrial Disputes Act, 1947, Workmen's Compensation Act, 1923, The Employees' Provident Funds and Miscellaneous Provisions Act, 1952 and the Payment of Gratuity Act, 1972, Unorganised Workers' Social Security Act 2008.
- The students will be able to understand the provisions of the Factories Act, 1948.

LL.B 5th Semester

Paper-XXII
LB- 502
Land Laws

Max. Marks: 100

Learning Outcomes:

- To enable the students to understand different legislations comprising land and revenue laws.
- To apprise the students with the professional dimension of the land laws since the land disputes comprise of a big area of litigation in India.
- To enable the students to get the composite understanding of the land and revenue laws.

LL.B 5th Semester

Paper-XXIII

LB- 503

Insurance Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to understand the intricacies of the insurance law.
- To acquaint the students to understand the theoretical and practical aspects of the insurance law with all its branches of insurance law.
- To introduce the students with the professional skills of insurance law since cases relating to insurance law constitute a big chunk of litigation in India.

LL.B 5th Semester

Paper-XXIV

LB- 504

International Environmental Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to evaluate and formulate environmental law and policy framed at the international level.
- The students will be able to understand effectively the working of the Institutions relating to environment under the auspices of the United Nations.
- The students will be able to develop ability to assess the social and ecological impacts of environmental law and policy to be applied in the litigation between the State parties.

LL.B 5th Semester

Paper-XXIV (a)

LB- 504 (a)

Intellectual Property Rights

Max. Marks: 100

Learning Outcomes:

- The learners will be able to use the principles of various IP laws while analyzing any problem related to IPR.
- Proficiency with the ability to engage as Patent Attorney, Trade Mark Agent and to work in the law firms specializing in IPR etc.

LL.B 5th Semester

Paper-XXV

LB- 505

Practical Training: Drafting, Pleading and Conveyancing

Max. Marks: 100

Learning Outcomes:

- The students will be able to draft legal documents.
- The students will be able to guide and advise client regarding effect and enforcement of deeds and documents.
- The students will be able to structure a commercial contract, draft notices and pleadings.

LL.B 6th Semester

Paper-XXVI

LB- 601

Principles of Taxation Laws

Max. Marks: 100

Learning Outcomes:

- The students will be able to understand procedure of direct tax assessment.
- The students will get thorough knowledge about the means and techniques of computing the total income and define tax complications and structure.
- The students will be imbued with the understanding of amendments made from time to time in Finance Act

LL.B 6th Semester

Paper-XXVII

LB- 602

Labour Law-II (Social Security & Social Welfare Legislation)

Max. Marks: 100

Learning Outcomes:

- The students will be able to know the provisions and procedure about the factory inspection.
- The students will be able to understand the provisions and procedure of the Minimum Wage Act, 1948, Maternity Benefits Act, 1961, Employees' State Insurance Act, 1948.

LL.B 6th Semester

Paper-XXVIII

LB- 603

Interpretation of Statutes

Max. Marks: 100

Learning Outcomes:

- The student will be able to Locate, identify and critically analyse relevant statutes, statutory provisions and legislative instruments, as well as pertinent judicial authority;
- The student will be able to interpret the appropriate provisions using the accepted tools and techniques of statutory interpretation;

- The student will be able to apply statutory provisions to fact scenarios and communicate the interpretation, nature and effect of statutory provisions to relevant stakeholders, such as clients and courts.

LL.B 6th Semester

Paper-XXIX

LB- 604

Media and Law

Max. Marks: 100

Learning Outcomes:

- The students will be able to evaluate the role and impact of self regulation on the media and journalists.
- The students will be able to understand the role of the press in a democracy.
- The students will be able to explain and apply the laws of defamation and Contempt of court, privacy law, broadcasting law and intellectual property to practice.

LL.B 6th Semester

Paper-XXX

LB- 605

Moot Court, Pre Trial Preparations and Internship

Max. Marks: 100

Learning Outcomes:

- The students will be able to develop advocacy skills.
- The students will get familiarize with the various stages of trial in civil and criminal cases.
- The students will be exposed to real court experience and they should imbibe the skills of client interviewing.

LL.B 6th Semester

Paper-XXXI

LB- 606

Human Rights: Law and Practice

Max. Marks: 100

Learning Outcomes:

- The students will be able to think analytically about the implementation and development of international human rights law and to apply this body of law in your own professional and national setting.
- The students will be able to promote an advanced and complex understanding of the theoretical, conceptual and practical challenges facing the fields of human rights law and sustainable development, adopting an interdisciplinary approach.
- The students will be able to analyze complex problems, find and deploy a variety of legal authorities, and communicate effectively in a variety of settings.

Paper-XXXII

LB- 607

General English

Max. Marks: 60

Learning Outcomes:

- To enable the students to learn English since it constitutes the basic language for the academicians, professionals and judges.
- To empower the students to enhance their communicative skills in English.
- To enable the students to learn English in particular the language and its application in legal academics (Legal Language).

Master of Laws(LL.M.)

Programme Objectives:

The curriculum of LL.M. has been designed to prepare students with the key skills and competencies required to demonstrate these learning outcomes in academics, profession and corporate sector. Every student after the completion of his LL.M. should be able to meet the following requirements:

1. He should demonstrate to identify and understand the key concepts in Indian substantive law;
2. He should be able to apply the key concepts of substantive law to the given set of facts, skill of legal analysis, reasoning and problem solving;
3. He should demonstrate the knowledge of the precedent and their application to the given facts;
4. He should demonstrate the sharp acumen to the legal research;
5. He should have the understanding of international law and perform international research;
6. He should demonstrate communicative skills, including client interviewing and counseling, effective listening, critical reading, objectivity in legal drafting and persuasive skills;
7. He should be able to demonstrate professional judgment, ethics, and professionalism through conduct consistent with the professional values, standard, and discipline;
8. He should be able to understand, collaborate and engage with people of diverse backgrounds and experiences in a variety of legal settings;

9. He should demonstrate understanding of the professional commitment to access to justice;
10. He should have the knowledge and exposure to the career options and employment avenues available to a legal professional.

Programme Specific Outcome

Legal education programme is one of the scientific and creative mode of advance education. Its specialties are to develop leadership, interpreter, advisor, arbitrator, legal culturist, and value maker. It can be summarized in following manner-

- (i) Evaluate a case opinion from multiple perspectives: e.g., use of precedent, reasoning and rhetoric; reliance of historic, economic or political sources and cultural or social values; special attention in prospective impact.
- (ii) Construct a synthesis of multiple case holdings to properly read, understand and use statutes and other enacted rules to solve legal problems or construct legal arguments.
- (iii) Understand the basic theories and practice of legislative enactment and interpretation.
- (iv) Understand the relationship between cases and statutes, and proper and appropriate use of solution of legal problem.
- (v) Predict the probable judicial resolution of simulated legal disputes.
- (vi) Recognize legal issues in simulated scenarios.
- (vii) Identify and categorize relevant material facts in scenario.
- (viii) Identify and synthesize relevant rules of law from one or more primary legal authorities.

- (ix) Identify and evaluate analogies and distinctions between facts in the sources of the rules and in scenario facts.

Course Outcome

Prepare students in order to achieve professional excellence, commitment to fairness, justice, compassion, and the highest ethical standard of moral values. In the legal education scope for career development, community service, leadership, faith on own capacity, adjust in global society, and inter disciplinary approach of research. Students after getting legal education shall competent in core and valuable assessment of social problem. Legal course of education shall develop core professional competencies. This are-

First: competencies in knowledge of law and legal profession.

Second: competencies relating to professional skills. Fundamentals of Course outcome is as follows:

- 1. Careers:** To develop the academic skilled of students to enhance legal knowledge and competencies. It will enable the students to succeed in every range of career. The career of law student is in every field of life i.e. administration, legal profession, executor of plan or good planner, social reformer, value protector, self employer, motivator, arbitrator, mediator, conciliator, legal adviser, and best creator of society.
- 2. Service:** Prepare students to protect and preserve composite culture, secularism principles, value ideas, national development, serve community, participate in legal service programme, legal service provider and contribute in dispute resolution mechanism.
- 3. Leadership:** the legal course would provide opportunities to law students' professional skills of collaboration, counseling and needed for competent and ethical participation as leader of the legal

profession. All students will also demonstrate a basic understanding of business fundamentals and be able to read and understand basic financial documents as all rounder of the discipline and leader as legal expert.

- 4. Faith on own capacity:** LL.M. students will demonstrate a basic understanding global law, perform legal analysis, capacity in oral communication and oral arguments, deeper understanding of financial law, core doctrine of administrative law, intellectual property laws, legal analysis, ability to find out structural components, operational elements and analytical framework for a compliance function of major legal system of country.
- 5. Adjust in global society:** The purpose of law is to provide justice, this is global phenomenon. The students shall demonstrate understanding of universal principles of law including capacity of project management. Application and adoption of new vistas of law shall be correlated with the competency of skilled capacity by the students for the development of Law.
- 6. Inter-disciplinary approach of research:** law students shall demonstrate research knowledge of interdisciplinary legal studies. Students shall generate knowledge in the social world. Students usually prepared to undertake legal research and analysis, by getting quality legal education they will able to develop methodological skills to undertake interdisciplinary legal studies. Students shall get competency in social, problem and legal solution.

Paper-wise learning outcome

LL.M. 101 Law and Social Transformation in India

- Awareness of Indian approaches to social and economic problems in the context of law as a means of social control and change.
- A spirit of enquiry to explore and exploit law and legal institutions as a means to achieve development.
- The endeavor is to make the students aware of the role the law.

LL. M. 102 Indian Constitutional law

- It is very essential for meaningful understanding of students related to living documents of Constitution.
- Exposed the new challenges and perspective of Constitutional development.
- Explore the knowledge of specialized area of law.

LL.M. 103 Union-State Financial Relations

- Understand model of federalism and explore to analyze its application.
- Application of Co-operative relation between union and states.
- Development of understanding capacity in fiscal, trade and commerce areas of law.

LL.M. 104, Constitutionalism Pluralism and Federalism

- Real analysis of participatory democracy.
- Philosophical, fundamental and new horizons of rule of law.
- Comparative study of pluralism and secularism.

LL.M. 201: Mass Media and Law

- Knowledge about press, radio, television, films and its practical application.
- Develop capacity to make society modernization.
- Cultivation of mind of the students to increase potential values.

LL.M. 202: Administrative Law

- New norm of relationship between the state and its citizenship.
- Knowledge about civil service and administrative agencies.
- Standard of administrative behavior supported by constitutional values.

LL.M. 203: Jurisprudence and Judicial process

- Analysis and evaluation the legal process from broader juristic, perspective.
- To study the nature of judicial process as an instrument of social ordering.
- Highlight the role of court as policy maker, participant in the power process.

LL.M. 204: Legal Education and Research Methodology

- Law Student shall get an insight into the objectives of legal education.
- Produce law expert with better competent and expertise.
- Students shall familiarize him with the system of legal education.

LL.M. 301: Human Rights

- Understand the changing global scenario to bring new concept of human rights.
- Human rights protection and promotion in democratic society.
- Sense of responsibilities, obligation and duties for the betterment of society.
- Develop participatory democratic values in privatization, globalization and liberalization.

LL.M. 302: National Security, Public Order and Rule of Law

- Law student will be in position to understand social transparency of accountable functioning.
- Unity, integrity, sovereignty and rule of law are the core learning goal of legal analysis.
- Fundamental legal criticism of natural ideology and existing analysis.

LL.M. 304: Research Methodology (Practical)

- Research Methodology – Application of Research tools.
- Doctrinal Research – Research writing on given assignment
- Socio-Legal Research – Research writing on given socio-legal topic using primary data
- Law Teaching – Students are required to take law class teaching

LL.M. 400: Dissertation

- Socio-Legal problem for critical analysis.
- Develop Research writing skilled.
- Creative activities in legal research.
- Augmentation, argument, analytical and critical development habit of law students.

Programme Educational Objectives

The B.Sc. programme aims at holistic development of the students through the innovative and comprehensive study. Geology programme aims to provide an understanding of fundamental of Earth's interior, dynamics and processes involved. These competencies are developed in the students by providing through theoretical, practical and field.

On completion of the Programme, students will be able to:

- i) To get the basic knowledge of geology.
- ii) Develop independent learning abilities and analytical thinking through problem-based assignments, laboratory exercises and report writing.
- iii) Understand a scientific problem and conduct experiments that would make a substantial contribution to its solution
- iv) Apply knowledge and understanding in order to initiate and carry out an extended piece of work or project for higher studies.
- v) Develop team work and awareness amongst students towards the importance of multidisciplinary approach for problem solving skills
- vi) Train the students for attainment of technical skills, intellectual capability with exposure to modern technologies to serve as an individual or as a team leader.
- vii) Create awareness among students about conservation and sustainability of environment.

Programme Outcomes

The following are the outcome of Geology programme:

- i) Obtain in depth knowledge of Geology and think originally and draw the conclusions independently.
- ii) Apply appropriate methods, resources and computational tools with an understanding of their limitations.
- iii) Excel the potential among students as leaders in industry and management.
- iv) To develop the Professional identity as a Geologist, to understand the earth and environment
- v) Expertise in the operation of equipment, adherence to laboratory safety standards and good practices.
- vi) Develop scientific ethics, including, confidentiality and accountability.
- vii) Ability to express effectively in reports writing, presentations and to interact with others.



**Vision, Mission, PEO, PO, PSO & CO of
DEPARTMENT OF MATHEMATICS, KUMAUN UNIVERSITY, SOBAN SINGH
JEENA CAMPUS, ALMORA**



About the Department

- The department of Mathematics, Kumaun University, Nainital was established in 1951 at DSB Campus Nainital and the department of Mathematics at S. S. J. Campus , Almora come into existence in the year 1962. It is the biggest department in terms of strength of the students. The department is running undergraduate, post graduate and Ph. D. programs ever 1962. The department offers opportunities for the education and research in a wide spectrum of areas in Mathematics, such as Differential Geometry, Riemannian Geometry, Special functions, Operation Research, Mathematical statistics, Relativity & Astrophysics etc. Department is recognized as Centre of Excellence in Mathematical Science(CEMS) by Uttarakhand Science and Research Centre (USERC) in 2011. The department have dedicated, experienced & sincere faculty members and non – teaching members. Department has an MOU with National Defence Academy, Khadakwasla, Pune for Ph.D. degree. One assistant professor of National Defence Academy is doing his research work under the supervision of HOD Prof. Jaya Upreti. The department organized Madhava Mathematics Competition for undergraduate students with the collaboration of NBHM every year in winter.

Vision:

- Imparting of quality of Mathematics education and inculcating education of the spirit of research through innovative teaching and research methodologies.
- The centre stage Mathematical knowledge in the curriculum, install analytical and logical thinking among students and promote Mathematical reasoning as an important area of human thought.
- To achieve high standards of excellence in generating and propagating knowledge in Mathematics.
- Department is committed for providing an education that combines rigorous academics with joy of discovery.
- To provide an environment where student can learn, become competent users of Mathematics and understand the use of Mathematics in other disciplines.

Mission:

- To nurture mathematically inclined students & provide them a supportive environment that fosters intellectual growth.
- To create an environment that supports outstanding research.
- To pursue collaborate programmes with highly reputed national & international institute.
- To prepare our undergraduate students to develop the attitude and ability to apply Mathematical methods and ideas in a wide variety of careers.
- To produce post graduate students with strong foundation to join research or to serve industry.
- To provide the best possible facilities for our students, particularly in the area of computer facilities, library facilities and administrative support.

Programme Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) for Mathematics describe accomplishments that students are expected to attain within three to five years after graduation and post graduation.

- PEO – 1** : To provide students knowledge and insight in Mathematics so that they are able to work as mathematical professional.
- PEO – 2** : To prepare them to pursue higher studies and conduct research.
- PEO – 3** : To provide students with knowledge and capability in formulating & analysis of mathematical models in real life application.
- PEO – 4** : To introduce the fundamentals of mathematics to students and strength the student's logical and analytical ability.
- PEO – 5** : To develop teaching skills, subject knowledge in the course of their study which will help them to shine in various field including Education, IT etc.

Programme Outcomes (POs)

The UG and PG graduates of Mathematics will be able to:

- PO – 1** : **Knowledge domain:** Demonstrate an understanding of the basic concepts in mathematics, statistics, operations research and their importance in the solution of some real- world problems.
- PO – 2** : **Problem analysis:** Analyze and solve the well-defined problems in mathematics statistics, and operations research. Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decision. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- PO – 3** : **Presentation and Interpretation of Data:** Demonstrate the ability to manipulate and visualize data and to compute standard statistical summaries.
- PO – 4** : **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources and computing tool such as Excel, MATLAB, MATHEMATICA, SPSS etc with an understanding of the limitations.

- PO – 5** : **Ethics:** Analyze relevant academic, professional and research ethical problems and commit to professional ethics and responsibilities with applicable norms of the data analysis and research practices.
- PO – 6** : **Communication:** Effectively communicate about their field of expertise on their activities, with their peer and society at large. Such as, being able to comprehend and write effective reports and design documentation, make effective presentations.
- PO – 7** : **Project Management:** Apply Knowledge and understanding of principles of mathematics and statistics effectively as an individual, and as a member or leader in diverse teams to manage projects in multidisciplinary environment.
- PO – 8** : **Research Proposal:** Define, design and deliver a significant piece of research work that is clear and concise. Demonstrate the necessary skills and knowledge of deeper understanding of their chosen research area. Understand the philosophy of research in mathematical sciences and appreciate the value of its development.
- PO –9** : **Thrust area:**

Riemannian Geometry studies smooth manifolds using a Riemannian metric. There are many applications of Riemannian geometry to other branches of mathematics and to the sciences. Einstein used it and its generalization, Finsler geometry to formulate general relativity theory. It impacted group theory, representation theory analysis, algebraic and differential topology.

Relativity is one of the most famous scientific theories of the 20th century. Formulated by Albert Einstein in 1905, the theory of Relativity is the notion that the laws of physics are the same everywhere. The theory explains the behavior of objects in space and time, and it can be used to predict everything from the existence of black hole, to light bending due to gravity, to the behavior of the planet Mercury in its orbit.

Operations Research (OR) is relatively a new discipline. The first formal activities of OR were initiated in England during the Second World War, when a team of British scientists set out to make decisions regarding the best utilization of war material. OR begins when some mathematical and quantitative technique is used to verify the decision being taken. OR provides a quantitative technique or a scientific approach to the executives for making better decisions for operations under their control.

Statistics is about the mathematical modeling of observable phenomena, using stochastic models, and about analyzing data: estimating parameters of the model and testing hypotheses. In these notes, we study various estimation and testing procedures. We consider their theoretical properties and we investigate various notions of optimality.

Programme Specific Outcome (PSOs)

After the successful completion of UG and PG programs in Mathematics the students will be able to:

- PSO – 1** : Understand the mathematical concepts and application in the field of algebra / analysis, statistic, manifolds, relativity & astrophysics.
- PSO – 2** : For (B.Sc) -: Get jobs in public / private sectors and pursuing higher studies at national and international level.
- PSO – 3** : To apply knowledge of Mathematics in all the fields of learning including higher research and extensions.
- PSO – 4** : To provide a systematic understanding of the concepts and theories of mathematics and analyze the situations.

Course Outcomes (COs)

List of COs for UG and PG Courses of Mathematics

A. List of Undergraduate Courses

B. Sc. Three Year Degree Course

Department of Mathematics:

Semester	Paper	Title
Semester - I	I	Elementary Algebra and Trigonometry
	II	Differential Calculus
Semester - II	I	Geometry and vector analysis
	II	Integral Calculus
Semester -III	I	Advanced Algebra
	II	Differential Equations
	III	Mechanics
Semester- IV	I	Vector spaces and Matrices
	II	Real Analysis
	III	Mathematical Methods
Semester -V	I	Linear Algebra
	II	Complex Analysis
	III	Functions of several variables and Partial Differential Equations
Semester- VI	I	Numerical Methods
	II	Mathematical Statistics
	III	Operation Research

Semester - I

Paper I - Elementary Algebra and Trigonometry

S.No. Topics

1. **Numbers:** Natural numbers, Integers, Rational and Irrational Numbers, Real numbers, Complex numbers, Mappings, Equivalence relation and partitions, Congruence modulo n .
2. **Roots of Equations:** Fundamental Theorem of Algebra, Relation between Roots and Coefficients, Transformation of Equations, Descartes rule of signs, Algebraic Solution of Cubic equations (Cardan method), Bi-quadratic Equation.
3. **Elementary matrices:** Symmetric, Skew-symmetric, Hermitian and skew-Hermitian matrices, Elementary operations and matrices, ad joint and inverse of matrix.
4. **Trigonometry:** De-movire's Theorem and its applications, Exponential, Logarithmic, Circular and Hyperbolic function together with their inverses, Gregory's series and Summations of Trigonometric series.

Paper II – Differential Calculus

S.No. Topics:

1. **Limit, Continuity and Differentiability:** Functions of one variable, Limit of a function (ϵ - δ Definition), Continuity of a function, Properties of continuous functions, Intermediate value theorem, Classification of Discontinuities, Differentiability of a function, Rolle's Theorem, Mean value theorems and their geometrical interpretations, Applications of mean value theorems.
2. **Successive Differentiation, Expansions of functions and Indeterminate forms:** Successive Differentiation, n^{th} Differential coefficient of functions, Leibnitz Theorem; Taylor's Theorem, Maclaurin's Theorem, Taylor's and Maclaurin's series expansions.
3. **Tangents and Normals:** Geometrical meaning of $\frac{dy}{dx}$, Definition and equation of Tangent, Tangent at origin, Angle of intersection of two curves, Definition and equation of Normal, Cartesian subtangent and subnormal, Tangents and Normals of polar curves, Angle between radius vector and tangent, Perpendicular from pole to tangent, Pedal equation of curve, Polar subtangent and polar subnormal, Derivatives of arc (Cartesian and polar formula).
4. **Curvature and Asymptotes:** Curvature, Radius of curvature; Cartesian, Polar and pedal formula for radius of curvature, Tangential polar form, Centre of curvature, Asymptotes of algebraic curves, Methods of finding asymptotes, Parallel asymptotes.
6. **Singular Points and Curve Tracing:** Regular points and Singular Points of a curve, Point of inflection Double Points, Cusp, Node and conjugate points, Curve tracing.

II Semester

Paper I – Geometry and vector analysis

S.No. Topics:

1. **Polar Equation of conics:** Polar coordinate system, Distance between two points, Polar equation of a Straight line, Polar equation of a circle, Polar equation of a conic, Chords, Tangent and Normal to a conic, Chord of contact, Polar of a point.
2. **Vector Algebra and its Applications to geometry (Plane and Straight Line):** Triple product, Reciprocal vectors, Product of four vectors. General equation of a Plane, Normal and Intercept forms, Two sides of a plane, Length of perpendicular from a point to a plane, Angle between two planes, System of planes. Direction Cosines and Direction ratios of a line, Projection on a straight line, Equation of a line, Symmetrical and unsymmetrical forms, Angle between a line and a plane, Coplanar lines, Lines of shortest distance, Length of perpendicular from a point to a line, Intersection of three planes, Transformation of coordinates.
3. **Vector Differentiation:** Ordinary differentiation of vectors, Applications to mechanics, Velocity and Acceleration, Differential operator-Del, Gradient, Divergence and Curl.
4. **Vector Integration:** Line, Surface and volume integrals, Simple applications of Gauss divergence theorem, Green's theorem and Stokes theorem (without proof).

Paper II –Integral Calculus

S.No. Topics

1. **Definite Integrals:** Integral as a limit of sum, Properties of Definite integrals, Fundamental theorem of integral calculus, Summation of series by integration, Infinite integrals, Differentiation and integration under the integral sign.
2. **Functions Defined by Infinite Integrals:** Beta function, Properties and various forms, Gamma function, Recurrence formula and other relations, Relation between Beta and Gamma function, Evaluation of integrals using Beta and Gamma functions.
3. **Multiple Integrals:** Double integrals, Repeated integrals, Evaluation of Double integrals, Double integral in polar coordinates, Change of variables and Introduction to Jacobians, Change of order of integration in Double integrals, Triple integrals, Evaluation of Triple integrals, Dirichlet's theorem and its Liouville's extension.
4. **Geometrical Applications of Definite Integrals:** Area bounded by curves (quadrature), Rectification (length of curves), Volumes and Surfaces of Solids of revolution.

III Semester

Paper I – Advanced Algebra

S.No. Topics

1. **Rings:** Rings, Various types of rings, Rings with unity, Rings without zero divisors, Properties of rings, Sub rings.
2. **Ideals:** Ideals, Quotient rings, Principal ideals, Maximal ideals, Prime ideals, Principal ideal domains, Characteristic of a ring.
3. **Integral domains and Fields:** Integral domain, Field, Skew field etc., Field of quotients of an integral domain, Embedding of an integral domain in a field, Factorization in an integral domain, Divisibility, Units, Associates, Prime and irreducible elements, Unique Factorization Domain, Euclidean rings.
4. **Polynomial rings:** Polynomials over a ring, Degree of a polynomial, Zero, Constant and monic polynomials, Equality of polynomials, Addition and multiplication of polynomials, Polynomial rings, Embedding of a ring R into $R[x]$, Division algorithm, Euclidean algorithm, Units and associates in polynomials, Irreducible polynomials.

Paper II – Differential Equations

S.No. Topics

1. **Differential equations:** Introduction of Differential equations, Order and Degree of Differential Equations Complete primitive (general solution, particular solution and singular solutions), Existence and uniqueness of the solution $\frac{dy}{dx} = f(x, y)$.
2. **First Order Differential Equations:** Differential equations of first order and first degree, Separation of variables, Homogeneous Equations, Exact Equations, Integrating Factor, Linear Equation, Equation of First order but not of first degree, Various methods of solution, Clairaut's form, Singular solutions, Trajectory, Orthogonal Trajectory, Self-Orthogonal family of Curves.
3. **Linear Differential Equations:** Linear equations with constant coefficients, Complementary function, Particular integral, Working rule for finding solution, Homogeneous linear equations.
4. **Miscellaneous Equations:** Simultaneous differential equations, Differential equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ where P, Q, R are functions of x, y, z . Exact differential equations, Total differential equations, Series solutions of differential equations, Linear differential equations of second order with variable coefficients.
5. **Applications:** Initial and boundary value problems, Simple applications of differential equations of first order.

Paper III – Mechanics

S.No. Topics

1. **Rectilinear motion:** Newton's Laws of Motion, velocity and acceleration, motion under constant acceleration, motion under inverse square law, rectilinear motion with variable acceleration, Simple Harmonic Motion.
2. **Kinematics in two dimension:** Angular velocity and angular acceleration, Components of velocity and acceleration along coordinate axes, Radial and transverse components of velocity and acceleration, tangential and normal components of velocity and acceleration.
3. **Motion in resisting medium, constrained motion and Central orbits:** Terminal Velocity, Motion in resisting medium in a straight line, Motion on vertical circle, Cycloidal motion, Central Force, Central orbit, intrinsic equation, Pedal form, apse and apsidal distance.
4. **Statics:** Coplanar Forces, Equilibrium of forces in three dimensions, Common catenary, Catenary of uniform strength, Virtual work.

IV Semester

Paper I – Vector Space and Matrices

S.No. Topics

1. **Vector spaces:** Vector space, sub spaces, Linear combinations, linear spans, Sums and direct sums.
2. **Bases and Dimensions:** Linear dependence and independence, Bases and dimensions, Dimensions and subspaces, Coordinates and change of bases.
3. **Matrices:** Idempotent, nilpotent, involuntary, orthogonal and unitary matrices, singular and nonsingular matrices, negative integral powers of a nonsingular matrix; Trace of a matrix.
4. **Rank of a matrix:** Rank of a matrix, linear dependence of rows and columns of a matrix, row rank, column rank, equivalence of row rank and column rank, elementary transformations of a matrix and invariance of rank through elementary transformations, normal form of a matrix, elementary matrices, rank of the sum and product of two matrices, inverse of a non-singular matrix through elementary row transformations; equivalence of matrices.
5. **Applications of Matrices:** Solutions of a system of linear homogeneous equations, condition of consistency and nature of the general solution of a system of linear non-homogeneous equations, matrices of rotation and reflection.

Paper II – Real Analysis

S.No. Topics

1. **Continuity and Differentiability of functions:** Continuity of functions, Uniform continuity, Differentiability, Taylor's theorem with various forms of remainders.
2. **Integration:** Riemann integral-definition and properties, integrability of continuous and monotonic functions, Fundamental theorem of integral calculus, Mean value theorems of integral calculus.
3. **Improper Integrals:** Improper integrals and their convergence, Comparison test, Dritchlet's test, Absolute and uniform convergence, Weierstrass M-Test, Infinite integral depending on a parameter.
4. **Sequence and Series:** Sequences, theorems on limit of sequences, Cauchy's convergence criterion, infinite series, series of non-negative terms, Absolute convergence, tests for convergence, comparison test, Cauchy's root Test, ratio Test, Rabbe's, Logarithmic test, De Morgan's Test, Alternating series, Leibnitz's theorem.
5. **Uniform Convergence:** Point wise convergence, Uniform convergence, Test of uniform convergence, Weierstrass M-Test, Abel's and Dritchlet's test, Convergence and uniform convergence of sequences and series of functions.

Paper III – Mathematical Methods

S.No. Topics

1. **Integral Transforms:** Definition, Kernel.
2. **Laplace Transforms:** Definition, Existence theorem, Linearity property, Laplace transforms of elementary functions, Heaviside Step and Dirac Delta Functions, First Shifting Theorem, Second Shifting Theorem, Initial-Value Theorem, Final-Value Theorem, The Laplace Transform of derivatives, integrals and Periodic functions.
3. **Inverse Laplace transforms:** Inverse Laplace transforms of simple functions, Inverse Laplace transforms using partial fractions, Convolution, Solutions of differential and integro-differential equations using Laplace transforms. Dirichlet's condition.
4. **Fourier Transforms:** Fourier Complex Transforms, Fourier sine and cosine transforms, Properties of Fourier Transforms, Inverse Fourier transforms.

V Semester

Paper I – Linear Algebra

S.No. Topics

1. **Linear Transformations:** Linear transformations, rank and nullity, Linear operators, Algebra of linear transformations, Invertible linear transformations, isomorphism; Matrix of a linear transformation, Matrix of the sum and product of linear transformations, Change of basis, similarity of matrices.
2. **Linear Functionals:** Linear functional, Dual space and dual basis, Double dual space, Annihilators, hyperspace; Transpose of a linear transformation.
3. **Eigen vectors and Eigen values:** Eigen vectors and Eigen values of a matrix, product of characteristic roots of a matrix and basic results on characteristic roots, nature of the characteristic roots of Hermitian, skew-Hermitian, unitary and orthogonal matrices, characteristic equation of a matrix, Cayley-Hamilton theorem and its use in finding inverse of a matrix.
4. **Bilinear forms:** Bilinear forms, symmetric and skew-symmetric bilinear forms, quadratic form associated with a bilinear form.

Paper II - Complex Analysis

S.No. Topics

1. **Complex Variables:** Functions of a complex variable; Limit, continuity and differentiability.
2. **Analytic functions:** Analytic functions, Cauchy and Riemann equations, Harmonic functions.
3. **Complex Integration:** Complex integrals, Cauchy's theorem, Cauchy's integral formula, Morera's Theorem, Liouville's Theorem, Taylor's series, Laurent's series, Poles and singularities.
4. **Residues:** Residues, the Residue theorem, the principle part of a function, Evaluation of Improper real integrals.

Paper III – Functions of Severable Variables and Partial Differentiable Equations

S.No. Topics

1. **Functions of several variables:** Limit, continuity and differentiability of functions of several variables.
2. **Partial Derivatives:** Partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, Jacobians, Chain rule, Euler's theorem on homogeneous functions, harmonic functions, Taylor's expansion of functions of several variables.
3. **Partial differential equations:** Partial differential equations of first order, Charpit's method, Linear partial differential equations with constant coefficients. First-order linear, quasi-linear PDE's using the method of characteristics.
4. **Partial differential equations of 2nd-order:** Classification of 2nd-order linear equations in two independent variables: hyperbolic, parabolic and elliptic types (with examples).

VI Semester

Paper I – Numerical Methods

S.No. Topics

1. **Errors in numerical Calculations:** Absolute, Relative and Percentage errors, General Error, Error in series approximation.
2. **Solutions of Algebraic and Transcendental Equations:** Bisection method, False position method, Newton-Raphson Method, Picard's iteration method.
3. **Linear systems of equations:** Consistency of Linear System of equations, Solutions of Linear Systems by direct method: Guassian elimination and computation of inverse of a matrix, Method of Factorization,. Solutions of linear systems by iterative methods: Jacobi method, Gauss-Siedel method.
4. **Interpolation and curve fitting:** Errors in Polynomial interpolation, Finite differences, Differences of a polynomial, Newton's forward and backward interpolation, Central differences, Gauss, Stirling, Bessel's and Everett's Formulae, Lagrange's Interpolation formula.
5. **Numerical differentiation and integration:** Numerical differentiation, Newton-Cotes Integration formula, Numerical integration by Trapezoidal rule, Simpson's 1/3, Simpson's 3/8, and Romberg Integration.

Paper II- Mathematical Statistics

S.No. Topics

1. **Descriptive Statistics and Exploratory Data Analysis:** Frequency distribution, Graphical representation of a frequency distribution, Measures of central tendency, Measures of dispersion, Moments, skewness and kurtosis.
2. **Correlation and regression:** Scatter diagram, Karl Pearson's coefficient of correlation and its calculation, Regression and equations of lines of regression, Rank correlation coefficient, Concept of Partial and Multiple correlations in case of distribution of three variables.
3. **Probability:** Notion of Probability, Random experiment, sample space, Mathematical and statistical definitions of Probability of an event, Axiom of probability, elementary properties of probability; equally likely, mutually exclusive, independent and compound events, Conditional probability, Additive law of probability and Multiplicative law of probability, Mathematical expectation, Inverse probability, Baye's Theorem, Concept of random variable.

Paper III- Operation Research

S.No. Topics

1. **Basics of OR and LPP:** Development of OR, Definition, characteristics, scope, objectives and limitations of OR, convex sets, Basic feasible solutions, Formulation of LPP, Graphical Method to solve LPP, General LPP, Canonical and Standard forms, Properties of Solutions and Theory of Simplex method, Big M Method and Two phase simplex method, Degeneracy in LPP. Duality in LPP, Duality and simplex method, Dual simplex method.
2. **Transportation and assignment Models:** Formulation of TP, Transportation Table, Finding initial basic feasible solution, Test of optimality, Degeneracy, MODI method, Stepping Stone method, Solutions of Assignment problems, Hungarian method.

B.A. /B. Sc. Mathematics
Course Structure (Semester System)
Undergraduate level onward 2019.

I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester
Elementary Algebra and Trigonometry	Geometry and vector analysis	Analytical Geometry	Differential Equation	Real Analysis	Complex Analysis
Differential Calculus	Integral Calculus	Group Theory	Ring Theory	Functions of several variables and Partial Differential Equations	Linear Algebra

B. List of Postgraduate Courses

M. Sc. MATHEMATICS SEMESTER CURRICULUM

Semester	Paper	Title	Credits
Semester I	I	Real Analysis	6
	II	Topology	6
	III	Differential Geometry and Tensor Calculus	6
Semester II	I	Complex Analysis	6
	II	Abstract Algebra	6
	III	Differential Equations	6
Semester III	I	Linear Algebra	6
	II	Measure Theory	6
	III	Numerical Solutions of ODE and PDE	6
Semester IV	I	Dynamics of Rigid Bodies	6
	II	Functional Analysis	6
	III	Calculus of variation and Integral Equations	6
<ul style="list-style-type: none"> Electives for Semester I & III (Out of six papers only one paper will be opted) 			
		Mathematical Statistics	6
		Number Theory	6
		Fluid Mechanics	6
		Discrete Mathematics	6
		Computer Programming and Mathematical Computations	6
		Special Functions	6
<ul style="list-style-type: none"> Electives for Semester II & IV (Out of six papers only one paper will be opted) 			
		Relativity	6
		Riemannian Geometry	6
		Advanced Abstract Algebra	6
		Operation Research	6
		Statistical Analysis	6
		Dynamical System	6

SEMESTER I

Paper I

Real Analysis

Course No.: 5311

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Metric spaces with various examples, Open sets, Interior of a set, Structure of open subsets of the real line, Limit points, Closed sets, closure of a set, Subspaces.	6
2.	Cauchy sequences, Complete metric spaces and completion of a metric space, Continuity and Uniform continuity, Sequential notion of continuity and Uniform limit theorem, Compactness.	6
3.	Functions of several variables: Concept of functions of two variables, Simultaneous and iterated limits in functions of two variables.	6
4.	Partial derivatives: Definition, Existence and continuity, Interchange of order of differentiation, Directional derivatives.	6
5.	Composite functions, Continuity and differentiability of functions of two variables, Taylor's theorem.	6

Paper – II

TOPOLOGY

Course No.: 5312

Credit Hours: Per week

I Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Topological spaces with examples, Topologies on the real number system, Open sets, Neighbourhood of a point/set.	6
2.	Local Base, Base and sub-base of a topology, closed sets, interior, boundary, closure, limit point, Derived sets.	6

3.	Continuous functions, Homeomorphisms, Topological property and topological embedding, Rules for constructing continuous functions in topological spaces.	6
4.	Compact spaces, Limit point compact and Sequentially compact spaces, Locally compact spaces, Connected spaces, Path connected spaces, Components, Locally connected spaces.	6
5.	First and Second Countable spaces, Separable and Lindelof spaces, Separation axioms: T1, T2, T3 (Regular), T4 (Normal) spaces.	6

Paper –III

DIFFERENTIAL GEOMETRY AND TENSOR CALCULUS

Course No.: 5313

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Curves in space, parameterized curves, regular curves, helices, arc length, reparametrization (by arc length), tangent, principal normal, binormal, osculating plane, normal plane, rectifying plane, curvature and torsion of smooth curves, Frenet-Serret formulae, Frenet approximation of a space curve.	6
2.	Order of contact, Osculating circle, osculating sphere, spherical indicatrices, involutes and evolutes, Bertrand Curves, intrinsic equations of space curves, isometries of R^3 , fundamental theorem of space curves, surfaces in R^3 regular surfaces, co-ordinate neighborhoods, parameterized surfaces, change of parameters, level sets of smooth functions on R^3 , surfaces of revolution, tangent vectors, tangent plane. first and second fundamental forms, classification of points on a surface.	6
3.	Curvature of curves on surfaces, normal curvature, principal curvatures, geometric interpretation of principal curvatures, Euler theorem, mean curvature, lines of curvature, Rodrigue's formula, umbilical points, minimal surfaces, definition and examples, Gaussian curvature, intrinsic formulae for the Gaussian curvature, isometries of surfaces.	6

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| 4. | Christoffel symbols, curvature tensor, geodesics, geodesics on a surface of revolution, geodesic curvature of a curve. | 6 |
| 5. | n -dimensional real vector space, contravariant vectors, dual vector space, Covariant vectors, tensor product, second order tensors, tensors of type (r, s) , symmetry and skew symmetry of tensors, fundamental algebraic operations: Addition, multiplication, contraction and inner product. Quotient law of tensors. | 6 |

SEMESTER II

Paper - I

COMPLEX ANALYSIS

Course No.: 5321

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Conformal mappings, Power series representation of analytic functions, Analytic functions as mappings, Riemann sphere, Linear transformations, Mobius transformation, Cross ratios, Mobius transformation on circles.	6
2.	Derivative of an analytic function, Higher order derivatives, Cauchy's theorem integral formula. Morera's theorem, Cauchy inequality and Liouville's theorem.	6
3.	Counting zeros, The open mapping theorem, Maximum modulus principle, Schwarz lemma, The fundamental theorem of algebra.	6
4.	Harmonic functions, Mean value property, Poisson formula.	6
5.	Entire functions, Jensen's formula, Meromorphic functions.	6

Paper – II

ABSTRACT ALGEBRA

Course No.: 5322

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Normal and subnormal series, Zassenhaus's lemma, Schreiers' refinement theorem, composition series, Jordan Holder theorem, chain conditions, examples. Internal and external direct products and their relationship.	6
2.	Sylow subgroups. Sylow's I, II and III theorems, p – groups, examples and applications, Groups of order p q , Direct and inverse images of Sylow subgroups.	6
3.	Commutators. Solvable groups, solvability of subgroups and factor groups. Nilpotent groups and their equivalent characterizations.	6
4.	Rings, ideals, prime and maximal ideals ,quotient rings. Factorisation theory in commutative domains. Prime and irreducible elements, G.C.D. Euclidean Domains. Principal Ideal Domain. Divisor chain condition. Unique Factorisation Domains, examples and counter examples. Polynomial rings over domains. Eisenstein's irreducibility criterion .Unique factorisation in polynomial rings over U.F.D.s.	6
5.	Fields, finite fields, field extensions, Galois extensions.	6

Paper – III

DIFFERENTIAL EQUATIONS

Course No.: 5323

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs., Sturm-Liouville boundary value problem, Green's function.	6
2.	Formation of P.D.E.'s. First order P.D.E.'s, Classification of first order, P.D.E.'s, Complete, general and singular integrals, Lagrange's or quasi - linear equations, Integral surfaces through a given curve. Orthogonal surfaces to a given system of surfaces, Characteristic curves.	6
3.	Charpit's method, Jacobi's Method. Cauchy problem for first order PDEs.	6
4.	Linear equations with constant coefficients, Reduction to canonical forms, Classification of second order P.D.E.s.General solution of higher order PDEs with constant coefficients.	6
5.	Method of separation of variables: Laplace, Heat and Wave equations in Cartesian, cylindrical and spherical polar coordinates.	6

SEMESTER III

Paper – I

LINEAR ALGEBRA

Course No.: 5331

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	A brief review of vector space, Inner products, Orthogonality, Best approximations, Projections, Cauchy-Schwartz inequality.	6
2.	Adjoint of a linear transformation, Self adjoint transformations, Unitary operators.	6

3.	Normal operators: Definition and properties.	6
4.	Spectral theory for normal operator, Polar decomposition of a linear operator, Roots of a family of normal operators, Self adjoint algebra generated by a family of linear operators.	6
5.	Eigen vectors and eigen values of a linear operator, Minimal polynomial of a linear operator and its relations to characteristic polynomial, Caley-Hamilton theorem.	6

Paper – II

MEASURE THEORY AND INTEGRATION

Course No.: 5332

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Countable sets, uncountable sets, relation between the cardinality of a nonempty set and the cardinality of its power set; Boolean ring, σ -ring, Boolean algebra and σ -algebra of sets, Set function.	6
2.	Lebesgue Measure: Introduction, Outer measure, Measurable sets and Lebesgue measure, Example of nonmeasurable sets, Measurable functions.	6
3.	The Lebesgue Integral: The Riemann integral, The Lebesgue integral of a bounded function over a set of finite measure, The integral of nonnegative functions. The general Lebesgue integral, Convergence in measure.	6
4.	Containerized nursery- Type and size of container including root trainers, potting media.	6
5.	Differentiation and Integration: Differentiation of monotone functions, Functions of bounded variation, Differentiation of an integral, Absolute continuity, Convex functions.	6
6.	General Measure and Integration Theory: Measure spaces, Measurable functions, Integration, General convergence theorems, The L_p spaces, Measure and Outer Measure, Outer measure and measurability, The extension theorem, Inner measure, Caratheodory outer measure.	6

Paper –III

NUMERICAL SOLUTIONS OF ODE AND PDE

Course No.: 5333

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Numerical Solution of ordinary Differential equations: Numerical solution of ODE by Picard's, Euler's, Modified Euler's and Runge-Kutta methods, Boundary value problems: Finite difference method, Shooting method.	6
2.	Numerical Solution of Partial Differential equations: Classification of second order general PDE, Difference method.	6
3.	Difference methods for Parabolic PDE. Heat conduction equation and its numerical solutions with finite difference methods (Two and three level difference methods).	6
4.	Difference methods for Hyperbolic PDE. Wave equation and its numerical solutions with finite difference methods (First order only).	6
5.	Difference methods for Elliptical PDE. Dirichlet problem for Laplace equation and its numerical solutions with finite difference methods.	6

SEMESTER IV

PAPER - I

DYNAMICS OF RIGID BODIES

Course No.: 5341

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	D'Alembert's principle, Motion about a fixed axis (Finite and Impulsive forces).	6
2.	Motion in two dimensions under Finite and Impulsive forces.	6
3.	Principle of conservation of momentum and energy.	6
4.	Lagrange's equations in generalized co-ordinates.	6
5.	Hamilton's principle, principle of least action, Euler's geometrical and dynamical equations.	6

PAPER - II

FUNCTIONAL ANALYSIS

Course No.: 5342

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Inequalities (Auxiliary, Cauchy Schwarz, Holder and Minkowski), Example of metric spaces (especially $R^n, C^n, l^n C[a, b], s, B(A), l^p$).	6
2.	Normed and Banach Spaces, Completion of a normed space, Finite dimensional normed spaces; Compactness and finite dimension, linear operators, Bounded and continuous linear operators; Linear functional; linear operators and functional on finite dimensional spaces, Dual space.	6
3.	Inner product space; Hilbert space; Properties of Inner product spaces, Orthogonal complements and direct sums, Orthonormal sets and sequences; Hilbert adjoint operators, Self-Adjoint, Unitary and normal operators.	6

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| 4. | Zorn's Lemma, Hahn Banach Theorem for real vector, Open mapping theorem, Closed graph theorem. | 6 |
| 5. | Banach Contraction Principle (BCP), Some applications of BCP. | 6 |

PAPER - III

CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS

Course No.: 5343

Credit Hours: Per week

II. Course Outline

B. Lectures

S.No.	Topics	No. of Lectures
1.	Functionals and extremals, Necessary and sufficient conditions for extrema, Variation and its properties.	6
2.	Euler equations, Cases of several dependent and independent variables, Variational methods for boundary value problems in ordinary and partial differential equations, Functionals dependent on higher derivatives, Parametric forms, Simple applications.	6
3.	Classification of linear integral equations, Relation between differential and integral equations.	6
4.	Fredholm equations of second kind with separable kernels, Fredholm alternative theorem, Eigen values and eigen functions.	6
5.	Method of successive approximation for Fredholm and Volterra equations, Resolvent kernel.	6

Electives for Semester I & III (Out of six papers only one paper will be opted)

ELECTIVES (SEMESTER I & III)

MATHEMATICAL STATISTICS

Course No.: 5351

Credit Hours: Per week

II. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Descriptive Statistics: Measures of central tendency, dispersion skewness and kurtosis Elements of probability: Sample space, discrete probability, independent events, Baye's theorem, random variables and distribution functions (univariate, bivariate, and generalization to multivariate).	6
2.	Mathematical expectation and moments: Moment generating function, Characteristic function and cumulants. Probabilistic inequalities (Tchebychev, Markov and Jensen). Modes of convergence: weak and strong laws of large numbers. Central limit theorem (i.i.d. case). Markov chains with finite and countable state space, Poisson and birth- and- death processes.	6
3.	Some standard discrete and continuous univariate distributions (Binomial, Poisson, Normal, Gamma and Beta).	6
4.	Correlation, Rank correlation. Regression lines. Multiple and partial correlation of three variables only.	6
5.	Concept of sampling and statistics: simple random sampling Stratified sampling and systematic sampling, Probability proportional to size sampling, Ratio and regression methods.	6

THEORY OF NUMBERS

Course No.: 5352

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Divisibility theory in integers, Prime Numbers, Unique Factorization theorem.	6
2.	Theory of congruences, Fermet's theorem, Wilson's theorem.	6
3.	Number-theoretic functions: $d(n), \sigma(n), \mu(n), \varphi(n)$ and $\phi(n)$ including elementary results.	6
4.	Primitive roots, Residues, Quadratic Reciprocity Law, Perfect numbers.	6
5.	Fibonacci numbers, Continued fractions, Irrational numbers, Representation of numbers by two or four squares.	6

FLUID DYNAMICS

Course No.: 5353

Credit Hours: Per week

I. Course Outline:

A. Lectures

S.No.	Topics:	No. of Lectures
1.	Lagrangian and Eulerian methods, Equation of continuity, Boundary surface, Stream lines, Velocity potential, Euler's equation of motions, Bernoulli's theorem, Helmholtz equations, Cauchy's integral, Equation of motion under impulsive forces, Principle of energy.	6
2.	Motion in two dimensions, Velocity potential and current functions, Sources and sinks, Doublet and images, Circle theorem, Motion of circular and elliptic cylinder in two dimensions, Joukowski transformation, Motion in three dimensions, Three dimensional sources, Sinks and doublets, Image of source in front of sphere, Motion of spheres, Stroke's stream function.	6
3.	General theory of irrotational motion, Permanence of irrotational motion circulation, Stroke's theorem, Kelvin's circulation theorem, Green's theorem, Kelvin's minimum energy theorem, Conformal Representation, Kutta and Joukowski transformation.	6

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| 4. | Vortex motion: Rectilinear vortices, Rectilinear vortex with a circular section, An infinite row of parallel rectilinear vortices, Karman stream, Use of conformal transformation, Vortex pairs. | 6 |
| 5. | General theory of stress strain, Navier-Stroke's equations. | 6 |

DISCRETE MATHEMATICS

Course No.: 5354

Credit Hours: Per week

I. Course Outline:

A. Lectures

S.No.	Topics	No. of Lectures
1.	Principle of mathematical induction, Partially ordered sets, Lattices: Lattices as partially ordered sets, Their Properties, Lattices and algebraic systems. Principle of duality, Sub lattices, Complete, Complemented and Distributive lattices.	6
2.	Boolean algebra, Boolean functions, Boolean expressions, Applications to switching circuits.	6
3.	Elements of graph theory: Basic terminology, Paths and circuits, Eulerian and Hamiltonian graphs, Planar graphs, Directed graphs.	6
4.	Trees: Rooted trees, path lengths, spanning trees, minimum spanning trees.	6
5.	Permutations and Combinations, the rules of sums and products, Properties of binary relations, Equivalence relations and partitions, Functions and Pigeonhole principle, Principle of inclusion and exclusion.	6

COMPUTER PROGRAMMING AND MATHEMATICAL COMPUTATION

Course No.: 5355

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Introduction to Programming in C: Introduction to Algorithms & Flowcharts Variables, constant, Keywords, signed and unsigned modifiers.	6
2.	Expression and operators: Arithmetic, logical and relational operators, bitwise operators, incremental operators, assignment operators. Functioning of these operators. Control flow: If-else, switch, while, do-while, for loops, continue, break statements, Nesting of control statements and loops.	6
3.	Working with functions: Variable and functions, Argument passing to functions, type of functions, storage classes, scope rule, C preprocessor and standard libraries.	6
4.	Pointers, arrays and File handling: Pointers, addresses, arrays, multidimensional arrays, String, Input/ Output, Standard input and output, basic file handling.	6
5.	User Defined Data-types: Structure, Union, enumeration.	6

SPECIAL FUNCTIONS

Course No.: 5356

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Preliminaries, Gamma function and related functions, Gauss multiplication theorem, the hypergeometric differential equation, Gauss hypergeometric function.	5
2.	Preliminaries, Gamma function and related functions, Gauss multiplication theorem, the hypergeometric differential equation, Gauss hypergeometric function.	8

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| 3. | Bessel's equation, solution of Bessel's equation, Bessel's functions $J_n(x)$, Recurrence Formulae, Equations reducible to Bessel's equation, orthogonality of Bessel's Functions, A generating function for $J_n(x)$, Basic properties. | 5 |
| 4. | Legendre's equation, Legendre's polynomial $P_n(x)$, Legendre's function of the second kind $Q_n(x)$, General solution of Legendre's equation, Rodrigue's formula. | 8 |
| 5. | Legendre polynomials, A generating function of Legendre's polynomial, Orthogonality of Legendre polynomials, Recurrence formulae for $P_n(x)$. | 5 |

Electives for Semester II & IV (Out of five papers only one paper will be opted)

RELATIVITY

Course No.: 5371

Credit Hours: Per week

II. Course Outline

B. Lectures

S.No.	Topics	No. of Lectures
1.	Special Relativity: Inertial Frames of reference, Michelson-Morley experiment, Doppler effect, Stellar aberration, Simultaneity, Postulates of special relativity, Lorentz transformation, Length contraction, Time dilation, Clock paradox, Addition of velocities and accelerations, Four-dimensional space time, Light cone, Mass variation, Velocity four vector, Momentum and force, Mass-Energy relationship.	6
2.	General Relativity: Geodesics, Geodesic coordinates, Curvature tensor and its algebraic properties, Bianchi's identities, Contracted curvature tensor, Conditions for a flat space time, Displacement of space-time, Killing equations, Groups of motion, Space-time of constant curvature.	6
3.	Principal of covariance, Non-inertial frames of reference, Principal of equivalence, Weak field approximation of geodesic equations, Law of gravitation in empty space-time, Canonical coordinates, Schwarzschild solutions.	6

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| 4. | Experimental tests of general relativity, Schwarzschild metric in isotropic coordinates, Birkhoff's theorem, Law of gravitation in non-empty space time. | 6 |
| 5. | Energy-Momentum tensor for a perfect fluid, Poisson's equation as the weak field approximation, Schwarzschild interior solution, Gravitational collapse of a ball. Einstein-Maxwell equations of electromagnetism, Gravitational field of a point charge. | 6 |

RIEMANNIAN GEOMETRY

Course No.: 5372

Credit Hours: Per week

III. Course Outline

C. Lectures

S.No.	Topics	No. of Lectures
1.	Dual vector Spaces: N-dimensional real vector space, Covariant vectors, Dual space, Contravariant vectors, tensor product, Other tensors of second order, Tensors of type (r,s). Algebraic Operations on tensors: Symmetric and skew symmetric properties, Fundamental algebraic operations, Inner product of vectors, Euclidean vector space.	6
2.	Tensor Calculus: Differentiable manifold, Lie-bracket, Tangent space, Connexions, Covariant derivatives, Curvature tensor, Parallelism. Lie derivative, Exterior derivative, Cartan's structural equations.	6
3.	Riemannian geometry : Riemannian metric, Christoffel symbols, Curvature tensor with respect to Christoffel symbols, Differential operators, Geodesics, Geodesic coordinates, Riemannian curvature, Conformal curvature tensor, Frenet's formulae.	6
4.	Ricci's Coefficients of Rotation: Orthonormal basis, Curl of a congruence, Canonical congruences, Gaussian and Ricci curvature.	6
5.	Sub-manifolds and Hypersurfaces: Normals, Gauss's formulae, Weingarten equations, Coordinate viewpoint, Lines of curvature, Generalized Gauss and Mainardi-Codazzi equations.	6

ADVANCED ABSTRACT ALGEBRA

Course No.: 5373

Credit Hours: Per week

II. Course Outline

B. Lectures

S.No.	Topics	No. of Lectures
1.	Modules over a ring, Endomorphism ring of an abelian group, R-Module structure on an abelian group M as a ring homomorphism from R to $\text{End}_Z\{M\}$, Submodules, Direct summands, Annihilators, Faithful modules, Homomorphism, Factor modules, Correspondence theorem, Isomorphism theorems.	6
2.	$\text{Hom}_R[M, N]$ as an abelian group and $\text{Hom}_R[M, N]$ as a ring, Exact sequences, Five lemma, Products, coproducts and their universal property, External and internal direct sums.	6
3.	Free modules. Homomorphism extension property, Equivalent characterization as a direct sum of copies of the underlying ring, Split exact sequences and their characterizations, Projective modules, Injective modules, Divisible groups, Examples of injective modules, Boolean Algebra.	6
4.	Factorization of polynomials in extension fields, Splitting fields and their uniqueness, Separable field extensions, Perfect fields, Separability over fields of prime characteristic, Transitivity and separability, Automorphism of fields, Dedekind's theorem, Fixed fields, Normal extensions, Splitting fields and normality, Normal closures.	6
5.	Galois extensions, Fundamental theorem of Galois theory, Computation of Galois groups of polynomials.	6

OPERATION RESEARCH

Course No.:5374

Credit Hours: Per week

I. Course Outline:

B. Lectures

S.No.	Topics	No.of Lectures
1.	Basics of OR and LPP: Development of OR, Definition, characteristics, scope, objectives and limitations of OR, Formulation of LPP, Graphical Method to solve LPP, General LPP, Canonical and Standard forms, Properties of Solutions and Theory of Simplex method, Big M Method and Two phase simplex method, Degeneracy in LPP. Duality in LPP, Duality and simplex method, Dual simplex method, Revised simplex method and bounded variable problems.	6
2.	Transportation and assignment Models: Lp Formulation of TP, Transportation Table, Finding initial basic feasible solution, Test of optimality, Degeneracy, MODI method, Stepping Stone method, Solutions of Assignment problems, Hungarian method, Duality in assignment problem.	6
3.	Sensitivity Analysis: Changes in Objective Function Coefficient, Changes in constants, Changes in coefficients of decision variables in constraints, Structural changes.	6
4.	Integer and Dynamic Programming: Pure and Mixed integer programming, Gomory all IPP method, Fractional cut method, Branch and bound method, Dynamic programming: Recursive equation approach, dynamic programming algorithm.	6
5.	Network Analysis and Nonlinear Programming: Network flow problem, minimal spanning tree problem, shortest rout problem, maximal flow problem, minimum cost flow problems, critical path analysis, PERT and CPM, Formulation of NLPP, general NLPP, constrained optimization with equality and inequality constraints.	6

STATISTICAL ANALYSIS

Course No.: 5375

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	Statistical Inference: Concept of consistency, efficiency, sufficiency, unbiasedness, and completeness. Existence of best asymptotically, normal estimates under regularity conditions. Maximum likelihood and other methods of estimation. Properties of maximum likelihood estimates. Minimax and Baye's estimates. Interval estimation: Neyman's Approach. Best confidence intervals.	6
2.	Testing of Hypothesis: Simple and composite hypothesis, critical region, two types of errors, level of significance and power of a test. Most powerful test and uniformly most powerful test.	6
3.	Neyman and Pearson's lemma. Likelihood Ratio tests. Large sample test. Sampling distribution of mean and variates. Exact sampling distributions: t, F and Z distributions and tests of significance based on them. Chi square distribution and its applications. Non parametric tests. Analysis of variance and covariance. Gauss – Markov models. Fixed, random and mixed effect models.	6
4.	Simple and multiple linear regressions. Elementary regression diagnostics. Logistic regression.	6
5.	Hazard function and failure rates. Censoring and life testing series and parallel systems.	6

DYNAMICAL SYSTEM

Course No.: 5376

Credit Hours: Per week

I. Course Outline

A. Lectures

S.No.	Topics	No. of Lectures
1.	One Dimensional Dynamics: Examples of dynamical systems, Preliminaries from calculus, elementary definitions, Hyperbolicity, An example from quadratic family, symbolic dynamics.	6
2.	Topological conjugacy, Chaos, structural stability, Sarkovskii's theorem, The Schwarzian derivative, Bifurcation theory.	6

3. **Complex Analytic Dynamics:** Preliminaries from complex analysis, The Riemann sphere, Steriographic projection, Examples from quadratic maps. 6
4. Equicontinuity and normal families, Montel's Theorem, Julia and Fatou sets, Fixed and periodic points and their classification. 6
5. Critical points, Exceptional points, Properties of Julia sets, Mandelbrot set. 6

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