

## **PROGRAMME OUTCOMES FOR B.Ed. (2 YEARS)**

- PO 1 To develop an understanding of the contemporary Indian Society with special reference to education.
- PO 2 To create sensitivity about language diversity in classroom and its role in teaching learning process.
- PO 3 To understand basic concepts and ideas of educational theory.
- PO 4 To build understanding and perspective on the nature of the learner, diversity and learning.
- PO 5 To comprehend the role of the systems of governance and structural – functional provisions that support school education.
- PO 6 To develop problems solving ability through action research
- PO 7 To understand about teaching, pedagogy, school management and community involvement.
- PO 8 To understand various educational issues in the context of diverse socio, cultural and multilingual Indian Society.
- PO 9 To build skills and abilities of communication, reflection, art, aesthetics, theatre, self expression and ICT.
- PO 10 To understand various level of learners, their needs, an interest and peculiar problems and motivate them for learning.

**PROGRAMME SPECIFIC OUTCOMES (PSO):** After completion of the Program, learner's shall be able:

- PSO 1:** To assimilate and put to practice knowledge of Philosophical and sociological bases of education.
- PSO 2:** To acquire knowledge of various theories of Psychological development and their application in the field of education.
- POS 3:** To learn and apply various teaching skills in classrooms.
- POS 4:** To develop communication skills for effective teaching.
- POS 5:** To develop ability to understand and apply various ICT tools in the field of education.
- POS 6:** To develop understandings with respect to various pedagogical perspectives viz. Mathematics, Science, Languages, Social Studies, Commerce.
- POS 7:** To appreciate the role of teacher, school and community in conservation of environment.
- POS 8:** To apply their knowledge of fundamentals of guidance and counselling in dealing with problems of diverse learners, and recognize the role of teachers, school authorities and guidance-counsellor in providing guidance services.
- POS 9:** To emphasize the role of teacher as an agent of social change through peace and value education, and to engage student-teachers in preserving positive values and bringing harmony between traditional and modern values.
- POS10:** To engage with school and students in real contexts and participate in school activities.

- PSO11:** To develop and maintain teaching-learning resources, unit plans and reflective journals.
- PSO12:** To select and organise subject content and learning experiences from the community and undertake activities for community development.
- PSO13:** To engage with the educational issues of contemporary Indian society.
- PSO14:** To analyze curriculum in Indian context and demonstrate how curriculum development can be linked to innovation and change.
- PSO15:** To demonstrate skills, roles, responsibilities of an inclusive teacher.

### COURSE OUTCOMES

<b>Semester-I</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-101</b>	<b>Philosophical and sociological perspectives of Education</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Express the concept of education and state its various aims.</li> <li>2. Explain relationship between educational philosophy and aims of education.</li> <li>3. Explain various social factors influencing the process of education.</li> <li>4. Express and compare ideas of select philosophical thinkers.</li> <li>5. Understand the relationship between processes of education and culturalization.</li> </ol>
<b>B-102</b>	<b>Psychology of Development and Learning</b>	<p>The pupil- teacher will be able:</p> <ol style="list-style-type: none"> <li>1. To understand salient features and problems of growth and development during different stages.</li> <li>2. To analyze the role of teacher in developing socio-emotional climate in classroom.</li> <li>3. To deal with adjustment and mental health relates issues of students.</li> <li>4. To understand learning needs of students.</li> <li>5. To use motivation strategies in classroom.</li> <li>6. To guide personality development among students.</li> </ol>

		7. Use the concept of Intelligence and personality in determining teaching –learning strategies.
<b>B-103</b>	<b>Principles and Methods of Teaching</b>	The student-teachers will able to: <ol style="list-style-type: none"> <li>1. Understand the process of teaching and its components.</li> <li>2. Understand various methods &amp; techniques of teaching.</li> <li>3. Be prepared to inculcate desirable components of teaching, skills and models of teaching.</li> </ol>
<b>EPC-104</b>	<b>Language across Curriculum</b>	The student-teachers will able to: <ol style="list-style-type: none"> <li>1. Understanding the role and importance of language in teaching-learning.</li> <li>2. Acquisition of a critical understanding of the role of language in learning and development.</li> </ol>
<b>EPC-105</b>	<b>Psychological Tests</b>	The student-teachers will able to: <ul style="list-style-type: none"> <li>• Understand application and related aspects of selected psychological tests.</li> <li>• Analyse test-results with a view to understand child psychology, learning needs and teaching strategy.</li> </ul>

<b>Semester-II</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-201-A</b>	<b>Pedagogy of Mathematics</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Understandings mathematics as a discipline.</li> <li>2. The ability to critically explore methods and techniques of mathematics teaching.</li> <li>3. The ability to create pedagogic understanding of mathematical concepts in the classroom.</li> <li>4. Epistemological insights into Mathematics as a discipline.</li> <li>5. Ability to conduct action research in Mathematics teaching.</li> </ol>
<b>B-201-B</b>	<b>Pedagogy of Physical Sciences</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Have attained pedagogic understanding of physical sciences.</li> <li>2. Acquire the necessary skills, attitudes, values and competency of a science teacher.</li> <li>3. Develop insights into strategies for physical science teaching.</li> <li>4. Acquire skills of evaluating cognitive, affective and psychomotor outcomes.</li> <li>5. Acquire skills for scientific leadership in school and society.</li> <li>6. Acquire skill for Action-Research in Physical-sciences.</li> </ol>
<b>B-201-C</b>	<b>Pedagogy of Biological Science</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the nature, characteristics and values related to biological sciences.</li> <li>2. Understand development of Biology as a subject in National and International context.</li> <li>3. Acquire knowledge, skills and teaching competencies for conducting theory and practical lessons.</li> <li>4. Acquire skills of constructive teaching.</li> <li>5. Acquire ability to conduct Action-</li> </ol>

		<p>Research in Biological science teaching and learning.</p> <p>6. Acquire competencies to organize curricular and co-curricular activities in Biological sciences.</p>
<b>B-201-D</b>	<b>Pedagogy of English</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Develop an understanding of Indian classrooms with reference to use of English as a language.</li> <li>2. Critically evaluate various theoretical underpinnings in pedagogic context.</li> <li>3. Apply the methods and approaches for teaching English language.</li> <li>4. Develop lesson plans in accordance to prescribed method.</li> </ol>
<b>B-201-E</b>	<b>हिन्दी शिक्षण पाठ्यक्रम</b>	<ul style="list-style-type: none"> <li>• भाषा की शुद्धता पर अधिकार।</li> <li>• आत्माभिव्यक्ति में पूर्ण दक्षता।</li> <li>• भाषा की विविध विधाओं के अन्तर में स्पष्टता।</li> <li>• भाषा शिक्षण में नवीन सहायक सामग्रियों के प्रयोग में सफलता।</li> <li>• वचन और लेखन में कुशलता।</li> <li>• साहित्यिक रूचि का विकास।</li> </ul>
<b>B-201-F</b>	<b>Pedagogy of Sanskrit</b>	<p>Through undergoing this course the learner will:</p> <ol style="list-style-type: none"> <li>1. Cultivate an understanding of pedagogic challenges posed by Sanskrit as a subject.</li> <li>2. Assimilate pedagogic needs of Sanskrit through understanding the significance and foundation of teaching Sanskrit language.</li> <li>3. Develop an understanding of methods of teaching Sanskrit by learning about branches of the discipline and its established practices.</li> <li>4. Understand significance of instructional materials in teaching Sanskrit language.</li> <li>5. Demonstrate practical skills by exercising shloka recitation,</li> </ol>

		lecture, dramatization, etc.
<b>B-201-G</b>	<b>Pedagogy of Social Studies</b>	<ol style="list-style-type: none"> <li>1. The learner will understand the basic nature and foundations of teaching of Social studies.</li> <li>2. The learner will become equipped with different strategies and methods for teaching Social studies at secondary level.</li> <li>3. The learner will acquire skills of evaluating cognitive, affective and psychomotor outcomes in Social studies.</li> <li>4. The learner will acquire ability to undertake Action-Research in Social Studies.</li> <li>5. The learner will become equipped with competencies to organize curricular and co-curricular activities in social studies.</li> </ol>
<b>B-201-H</b>	<b>Pedagogy of Commerce</b>	<p>After undergoing the course the learner will be able:</p> <ul style="list-style-type: none"> <li>• To understand nature, need and importance of teaching commerce.</li> <li>• To know and use skills and competencies of teaching commerce at secondary level.</li> <li>• To understand different methods and techniques of evaluating cognitive, affective and psychomotor outcomes of Commerce teaching.</li> <li>• To understand the global issues and trends in the field of Commerce teaching.</li> <li>• To undertake Action-Research in the field of Commerce teaching.</li> <li>• To use different competencies to organize curricular and co-curricular activities in Commerce teaching.</li> </ul>
<b>B-202</b>	<b>School Administration and Management</b>	<p>The learner will be able:</p> <ol style="list-style-type: none"> <li>1. To understand the concept of school organization, administration &amp; management.</li> </ol>

		<ol style="list-style-type: none"> <li>2. To understand the latest trends in school organization, administration &amp; management.</li> <li>3. To identify and analyse the educational structure in India</li> <li>4. To identify various innovations in classroom management.</li> </ol>
<b>B-203</b>	<b>Educational Technology and ICT</b>	<p>The student-teacher will:</p> <ol style="list-style-type: none"> <li>1. Become aware of use of educational technology, ICT, Mass- media and multimedia.</li> <li>2. Become abreast with new technological trends in education.</li> <li>3. Get familiarized with fundamentals of ICT and multimedia.</li> <li>4. Be able to make best possible use of ICT and Multimedia in solving problems of teaching and learning.</li> </ol>
<b>EPC-204</b>	<b>Technology Enabled Learning</b>	<p>The student teacher will be able to:</p> <ul style="list-style-type: none"> <li>• Effectively use ICT tools, software applications and digital resources.</li> <li>• Integrate ICT into teaching-learning and evaluation process.</li> <li>• Use ICT for effective educational management.</li> </ul>
<b>EPC-205</b>	<b>Simulated, Micro and Supervised Teaching</b>	<p>The student-teacher will be able to:</p> <ul style="list-style-type: none"> <li>• Learn teaching skills and practice these in real classroom situations.</li> <li>• Take part in organization of different school activities.</li> <li>• Perform and deliver duties as specified from time to time.</li> <li>• Develop effective teaching learning materials.</li> </ul>

<b>Semester-III</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-301-A</b>	<b>Pre-internship and School Observation</b>	<ol style="list-style-type: none"> <li>1. The students will attain an understanding of different roles performed by teachers in school settings.</li> <li>2. The learners will attain proficiency in handling and/or maintaining different records maintained in school.</li> <li>3. The learners will attain a reflective attitude for improvement in different practice adopted in school.</li> </ol>
<b>B-301-B</b>	<b>Internship</b>	<p>The student-teachers will:</p> <ol style="list-style-type: none"> <li>1. Internalize different role expectations associated with teacher.</li> <li>2. Acquire different skills required for performance of their role as a subject-teacher.</li> </ol>
<b>B-302-A</b>	<b>Gender, School and Society</b>	<p>The student teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Develop a gender perspective in the field of education.</li> <li>2. Engage with his/her own position in society vis-a-vis gender roles.</li> <li>3. Observe and analyse field realities.</li> </ol>
<b>B-302-B.1</b>	<b>Teacher and Environmental Education</b>	<p>The pupil-teacher will:</p> <ol style="list-style-type: none"> <li>1. Develop understanding of his/her role in environmental conservation.</li> <li>2. Acquire global understanding of issues related to climate change.</li> <li>3. Develop sensitivity towards his responsibility for environmental conservation.</li> <li>4. Be able to organize various activities for conservation of environment.</li> <li>5. Be able to analyze various factors responsible for environmental degradation.</li> <li>6. Know about various organizations/agencies contributing in environmental</li> </ol>



		<p>conservation.</p> <p>7. Be able to discuss techniques for reducing adverse effects of climate change.</p>
<b>B-302-B.2</b>	<b>Guidance and Counseling</b>	<p>On successful completion of this course, student(s) will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of guidance/counselling and its significance for personality development of students.</li> <li>2. Provide primary guidance service to needy students.</li> <li>3. Analyze factors creating hindrance in student's developmental process.</li> <li>4. Understand process &amp; techniques of guidance &amp; counselling.</li> </ol>
<b>B-302-B.3</b>	<b>Value and Peace Education</b>	<p>The learners will:</p> <ul style="list-style-type: none"> <li>• Understand the concept of value education and peace education.</li> <li>• Move towards development of positive attitudes to make peaceful and value oriented society.</li> <li>• Understand positive and negative determinants related to value and peace.</li> <li>• Understand role of formal and informal agencies in development of value oriented and peaceful society</li> </ul>
<b>B-302-B.3</b>	<b>Basic Statistics</b>	<p>Through undergoing the course the learner will:</p> <ol style="list-style-type: none"> <li>1. Understand the concept and use of statistics in Education.</li> <li>2. Understand the nature and application of basic statistical methods.</li> </ol>
<b>EPC-303</b>	<b>Community Work</b>	<p>The learners will attain:</p> <ul style="list-style-type: none"> <li>• An understanding of the socio-cultural context and existing needs of students</li> <li>• Feel motivated to participate and organize specific community</li> </ul>

		<ul style="list-style-type: none"> <li>• Explain the concept and historical background of inclusive education.</li> <li>• Explain various forms of special children.</li> <li>• Analyze various programmes of teacher preparation for inclusive education.</li> <li>• Appreciate role and responsibilities of teacher in Inclusive Education</li> </ul>
<b>EPC- 405</b>	<b>Joyful Learning : Program <i>Anandam</i></b>	<p>The student-teachers will become able to:</p> <ol style="list-style-type: none"> <li>1. Express happiness and joy in feelings and behaviour in classroom and school.</li> <li>2. Develop emotional stability and a sense of self-reliance as inherent in program <i>Anandam</i>.</li> <li>3. Acquire skills of creative expression.</li> <li>4. Create a joyful learning environment.</li> </ol>

  
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DEPARTMENT OF BOTANY

## **H.N.B. PG COLLEGE KHATIMA**

**(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 postgraduate and Ph.D. students in the field of plant sciences that serve in academic and research institutions.
3. To serve society's needs and contribute to transforming 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 synthesize 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 organizations and societies.

### **PROGRAM OUTCOME:**

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

PO-1: Understand the 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, and their economic and ethnobotanical importance.

PO-5: Differentiate between different types of ecosystems and their structural components.

PO-6: Evaluate services provided by different ecosystems in the 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: Analyze the regeneration status of different tree species in their natural habitat. PO-10. Develop strategies for the conservation of rare and threatened plant species.

PO-11: Develop a protocol for propagation of economically and medicinally important plant species through plant tissue culture.

#### **PROGRAM SPECIFIC OUTCOME (PSOS):**

After the successful completion of the 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 for competitive exams like UPSC, NET, SET, GATE, etc.

PSO 3: Understand the multi-functionality of plants in the 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 U.G. LEVEL:**

1. Students will be able to explain how organisms function at the level of the biomolecules, genes, genome, cells, 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 P.G. 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



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वनस्पति विज्ञान विभाग  
हे०न०य०रा०स्नातकोत्तर महाविद्यालय  
खटीमा (ऊधम सिंह नगर)

# DEPARTMENT OF CHEMISTRY

## H.N.B. G.P.G. COLLEGE KHATIMA

Program specification outcome and Course Outcome are assessed by focusing on the outcome of internal as well as external examination. The marks obtained by the students in the semester/year examination, assignments, practical examination, etc. are reflective/ indicative of Programme/ Course outcomes. This offers information about the achievements of the students to the respective course teachers. Besides this, each department organizes Presentations, Quizzes, Chart/ Poster competitions to motivate the students to exert a little bit of extra effort for improving their performance. The POS is evaluated by the number of students getting selected in various institutions for higher or specialization studies and getting placement after the course.

### **Graduation:**

**Program outcome:** The U.G. program provides the understanding of fundamental chemistry from core to their basic application in daily life. At the end of this program student have acquired the knowledge of chemistry of system, surrounding and their positive and negative impact in our daily life and environment.

**Course outcome:** The students will be able to know

**Inorganic chemistry:** This course includes the fundamental study of atomic structure, periodic properties, Nature of chemical bonding, related theories and chemistry of all the elements of periodic table. Metallurgical processes, chemistry of transition elements, oxidation and reduction, coordination chemistry, hard and soft acid-base theory, metal-ligand bonding in transition metal complexes, magnetic properties of transition metal complexes, electronic spectra of transition metal complexes, thermodynamic and kinetic aspects of coordination compounds, organometallic chemistry, bioinorganic chemistry, inorganic polymers of silicon and phosphorus.

**Organic chemistry:** This course gives the understanding of structure and bonding, mechanism of organic reactions, stereochemistry of organic compounds and the study of different functional groups in organic molecules. Study of electromagnetic spectrum; absorption spectroscopy, spectroscopy, organo-metallic compounds, organo-sulphur compounds, heterocyclic compounds. Also it involves the study of biomolecular like carbohydrates, amino acids, peptides, proteins and nucleic acids which constitutes of body and monitor the functioning of life. Study of fats, oils and detergents, synthetic polymers, synthetic dyes, natural products.

**Physical Chemistry:-**This course links physical state with the chemical changes occurs in our surroundings and nature. The chemistry of different states i.e. Solid, liquid and gaseous state and colloidal state and branch of science that deals with the quantitative relationship between heat and other forms of energy called thermodynamics and the chemistry related to electrolytes called electrochemistry. Study of Elementary Quantum Mechanics, Spectroscopy, Photochemistry, Physical Properties and Molecular Structure, Solutions and Colligative Properties, Thermodynamics.

## **POST-GRADUATION**

**Program outcome:** The P.G program offer the understanding of detail, advanced and fine knowledge of chemistry. This program explores and covers the remaining concept of U.G program and links the text book chemistry to the daily life activities and their application. Importantly this program includes the course that deals with the study of interaction of light with matter called spectroscopy which helps in the real analysis.

## **COURSE OUTCOME: INORGANIC CHEMISTRY**

This Course encompasses the theories and bonding concepts in coordination compound and acids-bases in detail. The interesting chemistry of organometallic compounds.

The students will be able to know

1. The chemistry of main group elements, synthesis and properties of few main group compounds.
2. General properties and separation of lanthanides and actinides.
3. Basics of nuclear chemistry and radio analytical techniques.
4. Stability of organometallic compounds and clusters, and their applications as industrial catalysts.
5. Explain the formation, reaction mechanism and stability of coordination complexes.
6. Interpret the electronic and magnetic properties of inorganic compounds.

## **ORGANIC CHEMISTRY**

This advance organic chemistry course includes the mechanism, energy consideration, stereochemistry and different types of organic reactions in detail.

The students will be able to explain

1. Mechanistic aspects in nucleophilic and electrophilic substitution.
2. Reaction conditions, products formation and mechanisms of some named reactions.
3. Mechanisms of addition reactions of C=C and C=O bonds and elimination reactions.
4. Assess chromatographic separation and identification of organic compounds.
5. Distinguish purification, crystallization, and different distillation processes.
6. Recognize synthesis, purification and characterization of aspirin, Schiff's base, Diels-Alder adduct.

## **PHYSICAL CHEMISTRY**

This course includes the thermodynamic and kinetic behavior of reaction and various theories for reaction kinetics. The students will be able to:

1. Comprehend the redox processes in electrochemical systems.
2. Explain Debye-Huckel theory and determination of activity and activity coefficient.
3. Correlate and differentiate Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics, theories of specific heat for solids.
4. Interpret mechanism for chemical reactions for optimizing the experimental conditions.
5. Familiar with application of homogeneous and heterogeneous catalysis in chemical synthesis.
6. Explain the importance of adsorption process and catalytic activity at the solid surfaces.
7. Classify the colloidal material and their stability for many practical uses.

**GROUP THEORY AND INSTRUMENTATION CHEMISTRY:** Group Theory is the mathematical application to determine the symmetry of molecule and molecular operation and to obtain knowledge of its physical properties and binding nature. Instrumentation techniques involve the understanding about the instruments and techniques used in analysis.

The students will be able to explain

1. The concepts of symmetry and group theory in solving chemical structural problems.
2. Molecular structure by the use of character tables and projection operator techniques.
3. The importance of symmetry and group theory in spectroscopic applications.

**Spectroscopic Techniques:** This course deals with the study of interaction of light with matter. The light of different energy cause different type of changes like electronic, vibration, rotational, nuclear etc. interaction with different frequency light in molecule. Organic



spectroscopy includes NMR, ESR, Mossbauer, IR, UV-visible spectroscopy.

The students will be able to

1. Identify functional groups using IR,  $\lambda_{\max}$  for polyenes and  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds.
  2. Interpret Cotton effect curves for obtaining absolute configuration of chiral molecules with chromophores.
  3. Determine chemical structure by UV-Vis, IR,  $^1\text{H}$ NMR,  $^{13}\text{C}$ NMR and mass spectral data.
  4. Interpret microwave, vibration-rotation Raman and infra-red spectra for chemical analysis
  5. Analyze electronic spectra of different elements and simple molecules.
4. Comprehend Nuclear Magnetic and Electron Spin Resonance spectroscopic techniques for organic compounds analysis and medical diagnostics.

**Solid State Chemistry:** The students will be able to

1. Correlate the physicochemical properties, defects in solid, diffraction techniques, electrical and magnetic properties of materials.

**Chemistry for Biological System:** The students will be able to

1. Assess molecular structure and interactions present in proteins, nucleic acids, carbohydrates and lipids.
  2. Be familiar with organization and working principles of various components present in living cell.
  3. Evaluate kinetics, thermodynamics, and mechanism of protein folding.
1. Assess the structure and biological functions of proteins and the role of metals in biology.

**Inter Disciplinary Topics in Chemistry:** The students will be able to

1. Comprehend experimental techniques for different catalytic reactions.
2. Interpret physical and chemical characterization of catalysts and catalytic reaction.
3. Be familiar with various reagents and their applications in industry.
4. Various optical methods like AES, AAS, plasma and electric discharge spectroscopy, spectrofluorimetry, nephelometry and turbidimetry.
5. Potentiometric, coulometric, and voltametric methods of analysis.
6. Chromatographic techniques and applications.

**Photo Chemistry and Allied Chemistry:** Various reactions takes place by the effect of temperature change called thermal reaction. The reactions which takes place by the effect of light of different frequency and wavelength is called photochemical reaction and mechanism of such reactions studied under photochemistry.

The student will be able to

1. Conformational analysis of cycloalkanes, reactivity, chirality, interconversion, resolution and asymmetric synthesis.
2. Aromaticity, no aromaticity and antiaromaticity in carbocyclic and heterocyclic compounds.
3. Molecular orbital symmetry and possibility of thermally and photochemically pericyclic reactions.
4. Basics of photochemical reactions of alkenes, carbonyl and aromatic compounds.
5. Assess photochemistry and photophysical principles.
6. Identify and characterize of transient intermediates by ultrafast modern techniques.
7. know the theory and application of photochemistry and photophysical principles of macromolecules.

**organic Synthesis:** The synthesis of organic molecules involve various approached and mechanism, new molecules synthesized by mimicking the existing route amd concept. Retrosynthetic or disconnection approach also used to design various drug molecule and biologically active molecule.

The students will be able to interpret

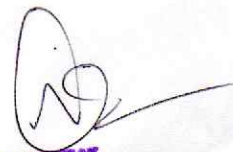
1. Mechanistic pathway of organic reactions.
2. Retro-synthetic approach to planning organic syntheses.
3. Conversion of different functional group *via* rearrangement reaction.

**Medicinal Chemistry:** The students will be able to

1. Comprehend drug designing and development, their SAR and QSAR.
2. Explain the mode of action of different drugs.
3. Describe the role of drugs to inhibit the particular enzymes and treatment of disease.

### **Program Specific Outcomes:**

Chemistry is a broad area, its important branch of science as everything we do is chemistry! All matter is made up of chemical, even our body is made of chemicals and chemical reaction occur when we eat, breath etc, so it's the study of everything. From starting (like extraction of elements, compounds) to their final state (like polymers, cosmetics, drugs and medicine etc.) Ready for application involve various chemical processes and purification techniques which were studied under the program. The advantage of leaning chemistry and acquiring knowledge about the process and techniques involves have great career opportunities in academic as well as industries. As this subject covers broad area, one can pursue a job as a pharmacologist, biochemist, lab technicians, analytical chemist, environmentalist, synthetic chemist, material scientist, geochemist, chemical engineer in industry.



विभागाध्यक्ष  
रसायन विज्ञान विभाग  
होनोरारोस्नातकोत्तर महाविद्यालय  
खटीमा (ऊधम सिंह नगर)

## **PROGRAMME OUTCOMES FOR B.Ed. (2 YEARS)**

- PO 1 To develop an understanding of the contemporary Indian Society with special reference to education.
- PO 2 To create sensitivity about language diversity in classroom and its role in teaching learning process.
- PO 3 To understand basic concepts and ideas of educational theory.
- PO 4 To build understanding and perspective on the nature of the learner, diversity and learning.
- PO 5 To comprehend the role of the systems of governance and structural – functional provisions that support school education.
- PO 6 To develop problems solving ability through action research
- PO 7 To understand about teaching, pedagogy, school management and community involvement.
- PO 8 To understand various educational issues in the context of diverse socio, cultural and multilingual Indian Society.
- PO 9 To build skills and abilities of communication, reflection, art, aesthetics, theatre, self expression and ICT.
- PO 10 To understand various level of learners, their needs, an interest and peculiar problems and motivate them for learning.

**PROGRAMME SPECIFIC OUTCOMES (PSO):** After completion of the Program, learner's shall be able:

- PSO 1:** To assimilate and put to practice knowledge of Philosophical and sociological bases of education.
- PSO 2:** To acquire knowledge of various theories of Psychological development and their application in the field of education.
- POS 3:** To learn and apply various teaching skills in classrooms.
- POS 4:** To develop communication skills for effective teaching.
- POS 5:** To develop ability to understand and apply various ICT tools in the field of education.
- POS 6:** To develop understandings with respect to various pedagogical perspectives viz. Mathematics, Science, Languages, Social Studies, Commerce.
- POS 7:** To appreciate the role of teacher, school and community in conservation of environment.
- POS 8:** To apply their knowledge of fundamentals of guidance and counselling in dealing with problems of diverse learners, and recognize the role of teachers, school authorities and guidance-counsellor in providing guidance services.
- POS 9:** To emphasize the role of teacher as an agent of social change through peace and value education, and to engage student-teachers in preserving positive values and bringing harmony between traditional and modern values.
- POS10:** To engage with school and students in real contexts and participate in school activities.

- PSO11:** To develop and maintain teaching-learning resources, unit plans and reflective journals.
- PSO12:** To select and organise subject content and learning experiences from the community and undertake activities for community development.
- PSO13:** To engage with the educational issues of contemporary Indian society.
- PSO14:** To analyze curriculum in Indian context and demonstrate how curriculum development can be linked to innovation and change.
- PSO15:** To demonstrate skills, roles, responsibilities of an inclusive teacher.

### **COURSE OUTCOMES**

<b>Semester-I</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-101</b>	<b>Philosophical and sociological perspectives of Education</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Express the concept of education and state its various aims.</li> <li>2. Explain relationship between educational philosophy and aims of education.</li> <li>3. Explain various social factors influencing the process of education.</li> <li>4. Express and compare ideas of select philosophical thinkers.</li> <li>5. Understand the relationship between processes of education and culturalization.</li> </ol>
<b>B-102</b>	<b>Psychology of Development and Learning</b>	<p>The pupil- teacher will be able:</p> <ol style="list-style-type: none"> <li>1. To understand salient features and problems of growth and development during different stages.</li> <li>2. To analyze the role of teacher in developing socio-emotional climate in classroom.</li> <li>3. To deal with adjustment and mental health relates issues of students.</li> <li>4. To understand learning needs of students.</li> <li>5. To use motivation strategies in classroom.</li> <li>6. To guide personality development among students.</li> </ol>

		7. Use the concept of Intelligence and personality in determining teaching –learning strategies.
<b>B-103</b>	<b>Principles and Methods of Teaching</b>	The student-teachers will able to: <ol style="list-style-type: none"> <li>1. Understand the process of teaching and its components.</li> <li>2. Understand various methods &amp; techniques of teaching.</li> <li>3. Be prepared to inculcate desirable components of teaching, skills and models of teaching.</li> </ol>
<b>EPC-104</b>	<b>Language across Curriculum</b>	The student-teachers will able to: <ol style="list-style-type: none"> <li>1. Understanding the role and importance of language in teaching-learning.</li> <li>2. Acquisition of a critical understanding of the role of language in learning and development.</li> </ol>
<b>EPC-105</b>	<b>Psychological Tests</b>	The student-teachers will able to: <ul style="list-style-type: none"> <li>• Understand application and related aspects of selected psychological tests.</li> <li>• Analyse test-results with a view to understand child psychology, learning needs and teaching strategy.</li> </ul>

<b>Semester-II</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-201-A</b>	<b>Pedagogy of Mathematics</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Understandings mathematics as a discipline.</li> <li>2. The ability to critically explore methods and techniques of mathematics teaching.</li> <li>3. The ability to create pedagogic understanding of mathematical concepts in the classroom.</li> <li>4. Epistemological insights into Mathematics as a discipline.</li> <li>5. Ability to conduct action research in Mathematics teaching.</li> </ol>
<b>B-201-B</b>	<b>Pedagogy of Physical Sciences</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Have attained pedagogic understanding of physical sciences.</li> <li>2. Acquire the necessary skills, attitudes, values and competency of a science teacher.</li> <li>3. Develop insights into strategies for physical science teaching.</li> <li>4. Acquire skills of evaluating cognitive, affective and psychomotor outcomes.</li> <li>5. Acquire skills for scientific leadership in school and society.</li> <li>6. Acquire skill for Action-Research in Physical-sciences.</li> </ol>
<b>B-201-C</b>	<b>Pedagogy of Biological Science</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the nature, characteristics and values related to biological sciences.</li> <li>2. Understand development of Biology as a subject in National and International context.</li> <li>3. Acquire knowledge, skills and teaching competencies for conducting theory and practical lessons.</li> <li>4. Acquire skills of constructive teaching.</li> <li>5. Acquire ability to conduct Action-</li> </ol>

		<p>Research in Biological science teaching and learning.</p> <p>6. Acquire competencies to organize curricular and co-curricular activities in Biological sciences.</p>
<b>B-201-D</b>	<b>Pedagogy of English</b>	<p>The pupil- teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Develop an understanding of Indian classrooms with reference to use of English as a language.</li> <li>2. Critically evaluate various theoretical underpinnings in pedagogic context.</li> <li>3. Apply the methods and approaches for teaching English language.</li> <li>4. Develop lesson plans in accordance to prescribed method.</li> </ol>
<b>B-201-E</b>	<b>हिन्दी शिक्षण पाठ्यक्रम</b>	<ul style="list-style-type: none"> <li>• भाषा की शुद्धता पर अधिकार।</li> <li>• आत्माभिव्यक्ति में पूर्ण दक्षता।</li> <li>• भाषा की विविध विधाओं के अन्तर में स्पष्टता।</li> <li>• भाषा शिक्षण में नवीन सहायक सामग्रियों के प्रयोग में सफलता।</li> <li>• वचन और लेखन में कुशलता।</li> <li>• साहित्यिक रूचि का विकास।</li> </ul>
<b>B-201-F</b>	<b>Pedagogy of Sanskrit</b>	<p>Through undergoing this course the learner will:</p> <ol style="list-style-type: none"> <li>1. Cultivate an understanding of pedagogic challenges posed by Sanskrit as a subject.</li> <li>2. Assimilate pedagogic needs of Sanskrit through understanding the significance and foundation of teaching Sanskrit language.</li> <li>3. Develop an understanding of methods of teaching Sanskrit by learning about branches of the discipline and its established practices.</li> <li>4. Understand significance of instructional materials in teaching Sanskrit language.</li> <li>5. Demonstrate practical skills by exercising shloka recitation,</li> </ol>



		lecture, dramatization, etc.
<b>B-201-G</b>	<b>Pedagogy of Social Studies</b>	<ol style="list-style-type: none"> <li>1. The learner will understand the basic nature and foundations of teaching of Social studies.</li> <li>2. The learner will become equipped with different strategies and methods for teaching Social studies at secondary level.</li> <li>3. The learner will acquire skills of evaluating cognitive, affective and psychomotor outcomes in Social studies.</li> <li>4. The learner will acquire ability to undertake Action-Research in Social Studies.</li> <li>5. The learner will become equipped with competencies to organize curricular and co-curricular activities in social studies.</li> </ol>
<b>B-201-H</b>	<b>Pedagogy of Commerce</b>	<p>After undergoing the course the learner will be able:</p> <ul style="list-style-type: none"> <li>• To understand nature, need and importance of teaching commerce.</li> <li>• To know and use skills and competencies of teaching commerce at secondary level.</li> <li>• To understand different methods and techniques of evaluating cognitive, affective and psychomotor outcomes of Commerce teaching.</li> <li>• To understand the global issues and trends in the field of Commerce teaching.</li> <li>• To undertake Action-Research in the field of Commerce teaching.</li> <li>• To use different competencies to organize curricular and co-curricular activities in Commerce teaching.</li> </ul>
<b>B-202</b>	<b>School Administration and Management</b>	<p>The learner will be able:</p> <ol style="list-style-type: none"> <li>1. To understand the concept of school organization, administration &amp; management.</li> </ol>

		<ol style="list-style-type: none"> <li>2. To understand the latest trends in school organization, administration &amp; management.</li> <li>3. To identify and analyse the educational structure in India</li> <li>4. To identify various innovations in classroom management.</li> </ol>
<b>B-203</b>	<b>Educational Technology and ICT</b>	<p>The student-teacher will:</p> <ol style="list-style-type: none"> <li>1. Become aware of use of educational technology, ICT, Mass- media and multimedia.</li> <li>2. Become abreast with new technological trends in education.</li> <li>3. Get familiarized with fundamentals of ICT and multimedia.</li> <li>4. Be able to make best possible use of ICT and Multimedia in solving problems of teaching and learning.</li> </ol>
<b>EPC-204</b>	<b>Technology Enabled Learning</b>	<p>The student teacher will be able to:</p> <ul style="list-style-type: none"> <li>• Effectively use ICT tools, software applications and digital resources.</li> <li>• Integrate ICT into teaching-learning and evaluation process.</li> <li>• Use ICT for effective educational management.</li> </ul>
<b>EPC-205</b>	<b>Simulated, Micro and Supervised Teaching</b>	<p>The student-teacher will be able to:</p> <ul style="list-style-type: none"> <li>• Learn teaching skills and practice these in real classroom situations.</li> <li>• Take part in organization of different school activities.</li> <li>• Perform and deliver duties as specified from time to time.</li> <li>• Develop effective teaching learning materials.</li> </ul>

<b>Semester-III</b>		
<b>Course Code</b>	<b>Title</b>	<b>Course Outcomes</b>
<b>B-301-A</b>	<b>Pre-internship and School Observation</b>	<ol style="list-style-type: none"> <li>1. The students will attain an understanding of different roles performed by teachers in school settings.</li> <li>2. The learners will attain proficiency in handling and/or maintaining different records maintained in school.</li> <li>3. The learners will attain a reflective attitude for improvement in different practice adopted in school.</li> </ol>
<b>B-301-B</b>	<b>Internship</b>	<p>The student-teachers will:</p> <ol style="list-style-type: none"> <li>1. Internalize different role expectations associated with teacher.</li> <li>2. Acquire different skills required for performance of their role as a subject-teacher.</li> </ol>
<b>B-302-A</b>	<b>Gender, School and Society</b>	<p>The student teacher will be able to:</p> <ol style="list-style-type: none"> <li>1. Develop a gender perspective in the field of education.</li> <li>2. Engage with his/her own position in society vis-a-vis gender roles.</li> <li>3. Observe and analyse field realities.</li> </ol>
<b>B-302-B.1</b>	<b>Teacher and Environmental Education</b>	<p>The pupil-teacher will:</p> <ol style="list-style-type: none"> <li>1. Develop understanding of his/her role in environmental conservation.</li> <li>2. Acquire global understanding of issues related to climate change.</li> <li>3. Develop sensitivity towards his responsibility for environmental conservation.</li> <li>4. Be able to organize various activities for conservation of environment.</li> <li>5. Be able to analyze various factors responsible for environmental degradation.</li> <li>6. Know about various organizations/agencies contributing in environmental</li> </ol>

		<p>conservation.</p> <p>7. Be able to discuss techniques for reducing adverse effects of climate change.</p>
<b>B-302-B.2</b>	<b>Guidance and Counseling</b>	<p>On successful completion of this course, student(s) will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of guidance/counselling and its significance for personality development of students.</li> <li>2. Provide primary guidance service to needy students.</li> <li>3. Analyze factors creating hindrance in student's developmental process.</li> <li>4. Understand process &amp; techniques of guidance &amp; counselling.</li> </ol>
<b>B-302-B.3</b>	<b>Value and Peace Education</b>	<p>The learners will:</p> <ul style="list-style-type: none"> <li>• Understand the concept of value education and peace education.</li> <li>• Move towards development of positive attitudes to make peaceful and value oriented society.</li> <li>• Understand positive and negative determinants related to value and peace.</li> <li>• Understand role of formal and informal agencies in development of value oriented and peaceful society</li> </ul>
<b>B-302-B.3</b>	<b>Basic Statistics</b>	<p>Through undergoing the course the learner will:</p> <ol style="list-style-type: none"> <li>1. Understand the concept and use of statistics in Education.</li> <li>2. Understand the nature and application of basic statistical methods.</li> </ol>
<b>EPC-303</b>	<b>Community Work</b>	<p>The learners will attain:</p> <ul style="list-style-type: none"> <li>• An understanding of the socio-cultural context and existing needs of students</li> <li>• Feel motivated to participate and organize specific community</li> </ul>

		<ul style="list-style-type: none"> <li>• Explain the concept and historical background of inclusive education.</li> <li>• Explain various forms of special children.</li> <li>• Analyze various programmes of teacher preparation for inclusive education.</li> <li>• Appreciate role and responsibilities of teacher in Inclusive Education</li> </ul>
<b>EPC- 405</b>	<b>Joyful Learning : Program <i>Anandam</i></b>	<p>The student-teachers will become able to:</p> <ol style="list-style-type: none"> <li>1. Express happiness and joy in feelings and behaviour in classroom and school.</li> <li>2. Develop emotional stability and a sense of self-reliance as inherent in program <i>Anandam</i>.</li> <li>3. Acquire skills of creative expression.</li> <li>4. Create a joyful learning environment.</li> </ol>

  
 विभागाध्यक्ष (बी०एड०)  
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DEPARTMENT OF BOTANY

## **H.N.B. PG COLLEGE KHATIMA**

**(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 postgraduate and Ph.D. students in the field of plant sciences that serve in academic and research institutions.
3. To serve society's needs and contribute to transforming 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 synthesize 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 organizations and societies.

### **PROGRAM OUTCOME:**

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

PO-1: Understand the 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, and their economic and ethnobotanical importance.

PO-5: Differentiate between different types of ecosystems and their structural components.

PO-6: Evaluate services provided by different ecosystems in the 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: Analyze the regeneration status of different tree species in their natural habitat. PO-10. Develop strategies for the conservation of rare and threatened plant species.

PO-11: Develop a protocol for propagation of economically and medicinally important plant species through plant tissue culture.

**PROGRAM SPECIFIC OUTCOME (PSOS):**

After the successful completion of the 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 for competitive exams like UPSC, NET, SET, GATE, etc.

PSO 3: Understand the multi-functionality of plants in the 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 U.G. LEVEL:**

1. Students will be able to explain how organisms function at the level of the biomolecules, genes, genome, cells, 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 P.G. 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

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खटीमा (ऊधम सिंह नगर)



# DEPARTMENT OF CHEMISTRY

## H.N.B. G.P.G. COLLEGE KHATIMA

Program specification outcome and Course Outcome are assessed by focusing on the outcome of internal as well as external examination. The marks obtained by the students in the semester/year examination, assignments, practical examination, etc. are reflective/ indicative of Programme/ Course outcomes. This offers information about the achievements of the students to the respective course teachers. Besides this, each department organizes Presentations, Quizzes, Chart/ Poster competitions to motivate the students to exert a little bit of extra effort for improving their performance. The POS is evaluated by the number of students getting selected in various institutions for higher or specialization studies and getting placement after the course.

### **Graduation:**

**Program outcome:** The U.G. program provides the understanding of fundamental chemistry from core to their basic application in daily life. At the end of this program student have acquired the knowledge of chemistry of system, surrounding and their positive and negative impact in our daily life and environment.

**Course outcome:** The students will be able to know

**Inorganic chemistry:** This course includes the fundamental study of atomic structure, periodic properties, Nature of chemical bonding, related theories and chemistry of all the elements of periodic table. Metallurgical processes, chemistry of transition elements, oxidation and reduction, coordination chemistry, hard and soft acid-base theory, metal-ligand bonding in transition metal complexes, magnetic properties of transition metal complexes, electronic spectra of transition metal complexes, thermodynamic and kinetic aspects of coordination compounds, organometallic chemistry, bioinorganic chemistry, inorganic polymers of silicon and phosphorus.

**Organic chemistry:** This course gives the understanding of structure and bonding, mechanism of organic reactions, stereochemistry of organic compounds and the study of different functional groups in organic molecules. Study of electromagnetic spectrum; absorption spectroscopy, spectroscopy, organo-metallic compounds, organo-sulphur compounds, heterocyclic compounds. Also it involves the study of biomolecular like carbohydrates, amino acids, peptides, proteins and nucleic acids which constitutes of body and monitor the functioning of life. Study of fats, oils and detergents, synthetic polymers, synthetic dyes, natural products.

**Physical Chemistry:-**This course links physical state with the chemical changes occurs in our surroundings and nature. The chemistry of different states i.e. Solid, liquid and gaseous state and colloidal state and branch of science that deals with the quantitative relationship between heat and other forms of energy called thermodynamics and the chemistry related to electrolytes called electrochemistry. Study of Elementary Quantum Mechanics, Spectroscopy, Photochemistry, Physical Properties and Molecular Structure, Solutions and Colligative Properties, Thermodynamics.

## **POST-GRADUATION**

**Program outcome:** The P.G program offer the understanding of detail, advanced and fine knowledge of chemistry. This program explores and covers the remaining concept of U.G program and links the text book chemistry to the daily life activities and their application. Importantly this program includes the course that deals with the study of interaction of light with matter called spectroscopy which helps in the real analysis.

## **COURSE OUTCOME: INORGANIC CHEMISTRY**

This Course encompasses the theories and bonding concepts in coordination compound and acids-bases in detail. The interesting chemistry of organometallic compounds.

The students will be able to know

1. The chemistry of main group elements, synthesis and properties of few main group compounds.
2. General properties and separation of lanthanides and actinides.
3. Basics of nuclear chemistry and radio analytical techniques.
4. Stability of organometallic compounds and clusters, and their applications as industrial catalysts.
5. Explain the formation, reaction mechanism and stability of coordination complexes.
6. Interpret the electronic and magnetic properties of inorganic compounds.

## **ORGANIC CHEMISTRY**

This advance organic chemistry course includes the mechanism, energy consideration, stereochemistry and different types of organic reactions in detail.

The students will be able to explain

1. Mechanistic aspects in nucleophilic and electrophilic substitution.
2. Reaction conditions, products formation and mechanisms of some named reactions.
3. Mechanisms of addition reactions of C=C and C=O bonds and elimination reactions.
4. Assess chromatographic separation and identification of organic compounds.
5. Distinguish purification, crystallization, and different distillation processes.
6. Recognize synthesis, purification and characterization of aspirin, Schiff's base, Diels-Alder adduct.

## **PHYSICAL CHEMISTRY**

This course includes the thermodynamic and kinetic behavior of reaction and various theories for reaction kinetics. The students will be able to:

1. Comprehend the redox processes in electrochemical systems.
2. Explain Debye-Huckel theory and determination of activity and activity coefficient.
3. Correlate and differentiate Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics, theories of specific heat for solids.
4. Interpret mechanism for chemical reactions for optimizing the experimental conditions.
5. Familiar with application of homogeneous and heterogeneous catalysis in chemical synthesis.
6. Explain the importance of adsorption process and catalytic activity at the solid surfaces.
7. Classify the colloidal material and their stability for many practical uses.

**GROUP THEORY AND INSTRUMENTATION CHEMISTRY:** Group Theory is the mathematical application to determine the symmetry of molecule and molecular operation and to obtain knowledge of its physical properties and binding nature. Instrumentation techniques involve the understanding about the instruments and techniques used in analysis.

The students will be able to explain

1. The concepts of symmetry and group theory in solving chemical structural problems.
2. Molecular structure by the use of character tables and projection operator techniques.
3. The importance of symmetry and group theory in spectroscopic applications.

**Spectroscopic Techniques:** This course deals with the study of interaction of light with matter. The light of different energy cause different type of changes like electronic, vibration, rotational, nuclear etc. interaction with different frequency light in molecule. Organic

spectroscopy includes NMR, ESR, Mossbauer, IR, UV-visible spectroscopy.

The students will be able to

1. Identify functional groups using IR,  $\lambda_{\text{max}}$  for polyenes and  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds.
  2. Interpret Cotton effect curves for obtaining absolute configuration of chiral molecules with chromophores.
  3. Determine chemical structure by UV-Vis, IR,  $^1\text{H}$ NMR,  $^{13}\text{C}$ NMR and mass spectral data.
  4. Interpret microwave, vibration-rotation Raman and infra-red spectra for chemical analysis
  5. Analyze electronic spectra of different elements and simple molecules.
4. Comprehend Nuclear Magnetic and Electron Spin Resonance spectroscopic techniques for organic compounds analysis and medical diagnostics.

**Solid State Chemistry:** The students will be able to

1. Correlate the physicochemical properties, defects in solid, diffraction techniques, electrical and magnetic properties of materials.

**Chemistry for Biological System:** The students will be able to

1. Assess molecular structure and interactions present in proteins, nucleic acids, carbohydrates and lipids.
  2. Be familiar with organization and working principles of various components present in living cell.
  3. Evaluate kinetics, thermodynamics, and mechanism of protein folding.
1. Assess the structure and biological functions of proteins and the role of metals in biology.

**Inter Disciplinary Topics in Chemistry:** The students will be able to

1. Comprehend experimental techniques for different catalytic reactions.
2. Interpret physical and chemical characterization of catalysts and catalytic reaction.
3. Be familiar with various reagents and their applications in industry.
4. Various optical methods like AES, AAS, plasma and electric discharge spectroscopy, spectrofluorimetry, nephelometry and turbidimetry.
5. Potentiometric, coulometric, and voltametric methods of analysis.
6. Chromatographic techniques and applications.

**Photo Chemistry and Allied Chemistry:** Various reactions takes place by the effect of temperature change called thermal reaction. The reactions which takes place by the effect of light of different frequency and wavelength is called photochemical reaction and mechanism of such reactions studied under photochemistry.

The student will be able to

1. Conformational analysis of cycloalkanes, reactivity, chirality, interconversion, resolution and asymmetric synthesis.
2. Aromaticity, no aromaticity and antiaromaticity in carbocyclic and heterocyclic compounds.
3. Molecular orbital symmetry and possibility of thermally and photochemically pericyclic reactions.
4. Basics of photochemical reactions of alkenes, carbonyl and aromatic compounds.
5. Assess photochemistry and photophysical principles.
6. Identify and characterize of transient intermediates by ultrafast modern techniques.
7. know the theory and application of photochemistry and photophysical principles of macromolecules.

**organic Synthesis:** The synthesis of organic molecules involve various approached and mechanism, new molecules synthesized by mimicking the existing route amd concept. Retrosynthetic or disconnection approach also used to design various drug molecule and biologically active molecule.

The students will be able to interpret


1. Mechanistic pathway of organic reactions.
2. Retro-synthetic approach to planning organic syntheses.
3. Conversion of different functional group *via* rearrangement reaction.

**Medicinal Chemistry:** The students will be able to

1. Comprehend drug designing and development, their SAR and QSAR.
2. Explain the mode of action of different drugs.
3. Describe the role of drugs to inhibit the particular enzymes and treatment of disease.

### **Program Specific Outcomes:**

Chemistry is a broad area, its important branch of science as everything we do is chemistry! All matter is made up of chemical, even our body is made of chemicals and chemical reaction occur when we eat, breath etc, so it's the study of everything. From starting (like extraction of elements, compounds) to their final state (like polymers, cosmetics, drugs and medicine etc.) Ready for application involve various chemical processes and purification techniques which were studied under the program. The advantage of leaning chemistry and acquiring knowledge about the process and techniques involves have great career opportunities in academic as well as industries. As this subject covers broad area, one can pursue a job as a pharmacologist, biochemist, lab technicians, analytical chemist, environmentalist, synthetic chemist, material scientist, geochemist, chemical engineer in industry.



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रसायन विज्ञान विभाग  
होनोरारोस्नातकोत्तर महाविद्यालय  
खटीमा (ऊधम सिंह नगर)

# **DEPARTMENT OF ECONOMICS**

## **H.N.B. P.G. COLLEGE KHATIMA**

### **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 the national level with special focus on regional socio-economic problems for inclusive development.

### **MISSION**

The mission of the Department 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 an 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 of 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 in society in the field of economics.
- The students with a well-resourced learning environment in economics can serve society as a professional.
- 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.

### **PROGRAM 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.

### **COURSE OUTCOME (CO)**

The department runs degree course at Graduate and Post-graduate level and in this section the program outcome for both levels is given separately.

## **POST GRADUATE LEVEL COURSE (MASTER OF ARTS IN ECONOMICS) CBCS PATTERN (SESSION 2020-21)**

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**

#### **MICROECONOMICS (1<sup>st</sup> and 2<sup>nd</sup> SEMESTER)**

On successful 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 maximization.
- 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 economics through various theories.

### **PUBLIC FINANCE (1<sup>ST</sup> AND 2<sup>ND</sup> SEMESTER)**

On successful 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 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 (1<sup>st</sup> AND 2<sup>nd</sup> SEMESTER)**

On successful 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 trade and 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 (1<sup>ST</sup> SEMESTER)**

On successful 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 sections to understand Indian Economic Thoughts.

### **QUANTITATIVE TECHNIQUES IN ECONOMICS (1<sup>ST</sup> SEMESTER)**

On successful 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 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 of Index Numbers for solving various economic problems.

## **INDIAN ECONOMIC DEVELOPMENT AND POLICY (2<sup>nd</sup> SEMESTER)**

On successful 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 (2<sup>nd</sup> SEMESTER)**

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

- Understanding and measuring the National income.
- 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 successful 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 labor market with special reference to Indian Labor Market.
- They will understand the recruiting methods followed by industries to recruit the industrial labor.

- 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 successful completion of the course the students will be able to

- 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 successful completion of the course the students will be able to

- Develop ideas for the basic concept of the 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 successful 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**

## **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 behavior and functioning of industries.
- This also gives insight into how the firms organize 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.
- 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 the Economy of Uttarakhand
- Understand the importance of Human resources in the economy of Uttarakhand and the concept of migration and inequality in rural areas.
- Understand the planning part of the economy as well as the magnitude of regional imbalances and regional planning in India
- Understand the Industrial structure of Uttarakhand economy.

## **GRADUATE LEVEL COURSE**

### **(BACHELOR OF ARTS IN ECONOMICS)**

#### **SEMESTER LEVEL – I & II**

#### **MICROECONOMICS I & II**

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

- The behavior of individuals and small organizations with the help of various theories developed in their respective field.
- It will result in equipping the students with the various aspects of consumer behavior 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 successful 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.
- This will help them to understand and analyze 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 successful 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**

### **PROBLEMS AND PROSPECTS OF INDIAN ECONOMY I & II**

On successful 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 successful 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.

  
विभागाध्यक्ष

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खटीमा (ऊ० सिंह नगर)

- ❖ Vocational course is also to be done in this semester (each of 4 credits).
- ❖ During the fifth and Sixth semester the students will have to go through two discipline specific core in theory paper (each of 4 credits ; total 8+8=16 credits) and one Practical paper (each of 2 credits ; total 2+2=4 credits).
- ❖ Apart from this co-curricular course is must in each semester. The major research project is compulsory in fifth and sixth semester separately. ( each of 4 credits)

**Programme outcomes (POs) :**

PO 1	<ul style="list-style-type: none"> <li>• This course will provide students the basic concept of Education</li> <li>• The student will be able to understand relation between education and society.</li> <li>• The student will be able to analyse Indian and western philosophy.</li> </ul>
PO 2	<ul style="list-style-type: none"> <li>• The student will be able to understand new trends and importance of ICT.</li> <li>• The student will be able to explain the importance of human rights, environment in our life.</li> <li>• The student will be able to explain the importance of values, mental health and hygiene.</li> </ul>
PO 3	<ul style="list-style-type: none"> <li>• Students will be able to understand interdisciplinary nature of the subject.</li> <li>• Program will be helpful in conceptualization and synthesis of knowledge of life skill and sustainable education.</li> </ul>
PO 4	<ul style="list-style-type: none"> <li>• Program will be helpful in conceptualization and synthesis of knowledge of Educational aspects in relation to: Human Development- Human Behavior, Teaching Learning, Measurement and Evaluation, Society and Nation.</li> </ul>
PO 5	<ul style="list-style-type: none"> <li>• The student will be able to understand importance of research and statistics in education.</li> </ul>
PO 6	<ul style="list-style-type: none"> <li>• The student will be able to analyse administration and management in education.</li> <li>• The student will be able to explain the glorious history of education.</li> </ul>

**Programme specific outcomes (PSOs) :**  
**UG I Year / Certificate Course in FUNDAMENTAL EDUCATION**

1. This course provides the basic ideas and concepts of education and role of society in education.
2. This course has attempted to introduce students the philosophical basis of education, explaining how the Constitutional system of the nation contribute in the field of education
3. This course intends to clarify the educational aims and functions.
4. This course will help students to understand the contribution of great western and Indian philosopher in education.
5. This course introduces the challenges faced by Indian Education and initiates a critical analysis of concerns and solutions towards better education.
6. Program will be helpful in conceptualization and synthesis of knowledge of life skill and sustainable education.
7. The student will able to explain the importance of values, mental health and hygiene.

**Programme specific outcomes (PSOs) :**  
**UG II Year/ Diploma in PERSPECTIVES OF EDUCATION**

- A. The course aims to acquaint students with characteristic features of ancient, medieval and British education system and educational commissions set up from time to time.
- B. The student will able to explain the glorious history of education.
- C. This course will help students to understand constitutional values and provisions for education and their rights.
- D. This course provides the basic ideas and concepts of human right and environmental education.
- E. This course introduces the students about concept of New Trends in Education and importance of ICT.
- F. It explores the process of development and learning Through ICT.
- G. The students will be able to check different aspects of psychological parameter which are important for education through the tests and scales.

**Programme specific outcomes (PSOs) :**  
**UG III Year / Bachelor of Arts in EDUCATION**

- This Course enables the students to understand basic concept of psychological foundations of education and teacher education.
- This course consists of the knowledge of history of teacher education and various types of teacher education programmes in India.
- This program will be helpful in conceptualization and synthesis of knowledge of Educational aspects in relation to: Human Development- Human Behavior, Teaching Learning process.
- The programme will be helpful to know the major theories, concepts and mechanism which explain human behavior or various psychological phenomena.
- This course will enhance ability of students to interpret the design and conduct of basic research in education.
- This course provides the assessment and evaluation techniques used in Education by psychological tools.
- This course enables the students to understand concepts and needs of statistics in education.
- This course consists of the knowledge of Educational Administration and Management in schools.
- It will develop an insight about the organizational and Administrative structure of Education.
- This course discusses about the various governing/regulatory bodies of the Indian Education System.
- The student will able to understand importance of research and statistics in education.
- This Program will be helpful for students to understand MS Office and able to interpret /present research data diagrammatically or graphically with the help of computer.
- This course enables the students to understand concepts, needs and importance of Guidance and Counseling in our life.

<p><b>PSO 1</b></p>	<ul style="list-style-type: none"> <li>➤ The student will be able to understand the concept of psychological foundations of education.</li> <li>➤ To know the different psychological major theories of learning, intelligence and personality.</li> <li>➤ Students will be able to conceptualize the knowledge of Educational aspects in relation to human development.</li> </ul>
<p><b>PSO2</b></p>	<ul style="list-style-type: none"> <li>➤ The student will be able to understand the concept and need of teacher education.</li> <li>➤ The student will understand history of teacher education and various types of teacher education programme in India.</li> </ul>
<p><b>PSO 3</b></p>	<ul style="list-style-type: none"> <li>➤ The student will enhance ability to interpret design and conduct basic psychological research.</li> <li>➤ The student will be able to understand importance of research and statistics in education.</li> <li>➤ This course enables the students to imply statistics in research work in education.</li> </ul>
<p><b>PSO 4</b></p>	<ul style="list-style-type: none"> <li>➤ The students will be able to explain the concept and needs of Administration and Management in Education.</li> <li>➤ It will develop an insight about the organizational and Administrative structure of education.</li> <li>➤ The students will understand types of educational planning.</li> </ul>
<p><b>PSO 5</b></p>	<ul style="list-style-type: none"> <li>➤ This paper enables understanding about the various governing/regulatory bodies of the Indian Education System.</li> <li>➤ The student able to conduct the assessment and evaluation techniques used in Education with the help of psychological tools.</li> </ul>
<p><b>PSO 6</b></p>	<ul style="list-style-type: none"> <li>➤ The students will be able to understand computer programme MS Office and able to interpret /present research data diagrammatically or graphically with the help of MS Office.</li> <li>➤ This course enables the students to understand concepts, needs and importance of Guidance and Counseling in our life.</li> <li>➤ The students will be able to analyze difference between Guidance and Counseling.</li> </ul>

**DEPARTMENT OF ENGLISH**  
**H.N.B. POST GRADUATE COLLEGE KHATIMA**  
**PROGRAMME OUTCOME**

The main programme outcomes of M. A. in English are:

- Students shall be able to read, interpret, understand and write about diverse range of texts in English analytically and critically
- Students shall be able to analyze texts of a variety of literary genres in terms of style, figurative language and convention.
- Students shall be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
- Students shall be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students shall be able to ethically gather, understand, evaluate and synthesize information from a variety of written and web sources.
- Students shall be able to understand the growth of literature in India in English translation from classical to modern times.
- 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.
- Students shall be educated in both artistry and utility of English language through the study of literature and other contemporary forms of culture.
- 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.
- Students shall become good human beings as the course shall teach them the true philosophy of life.



# **DEPARTMENT OF GEOGRAPHY**

## **H.N.B. P.G. COLLEGE KHATIMA**

### **VISION OF THE DEPARTMENT**

Geography as a subject is offered at the undergraduate and postgraduate level to Arts, Science, and 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 society. Also, they will be to appreciate the current usage of in various fields of importance in agriculture, business, and industry. Further, the students will be exposed to the current trends in understanding basic physical and Human systems that affect everyday life (e.g. earth-sun relationships, water cycles, wind and ocean currents Population, settlement and 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 a random scattering of people and places.
- Enable to have sound knowledge of the theory and practical for understanding core subjects
- Facilitate the development and application of problem-solving skills in students.
- After all students are 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 a 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 of 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.
- Motivate students involved in self-reflexivity and lifelong learning.
- To inspire students in integrating different aspects of physical, practical, aesthetic, moral and intellectual dimensions of education to develop a holistic personality of each student.
- To help the student in becoming a responsible citizen for the nation and a sensitive and creative human resource for the society's 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, and 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 leaders from local to global levels.

**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.

## **SEMESTER COURSE FRAMEWORK**

### **SEMESTER-I**

#### **Geography (B.A/B. Sc)**

#### **PAPER I -PHYSICAL GEOGRAPHY (GUGP-101)**

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

- This course will familiarize students with 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: origin and classification.
- Interpret the Origin of continents and ocean basins and related theories, and describe Mountains, Plateaus and Plains, Gradational processes, Weathering and Erosion.
- Analyze Composition and structure of the atmosphere, Insulation, Vertical and Horizontal Distribution of atmospheric temperature Pressure and pressure belts, and Wind: 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**

**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 Techniques) (GUGP-P-103)**

**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)**

**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)**

**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
- Describe 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)**

**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**

### **PAPER I- CLIMATOLOGY AND BIOGEOGRAPHY (GUGP-301)**

**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**

**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
- Describe 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)**

**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**

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

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
- Describe Urban areas and the conurbation, Rural-urban fringe, Umland
- Describe Functional classification of towns, Hierarchy of urban settlement, Town planning: Meaning and principles

### **PAPER II- ENVIRONMENTAL GEOGRAPHY (GUGP-P-402- (a))**

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)**

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**

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, Intersection, Close Traverse, Open Traverse, and Correction of bearing
- Perform Plane Table Surveying: Radiation, Intersection, Close Traverse, Open Traverse, Resection by two point and three-point problems
- Measure height/depth by Indian Pattern Clinometer



## **SEMESTER-V**

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

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))**

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**

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**

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- PROJECTIONS**

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**

### **PAPER I- ECONOMIC GEOGRAPHY**

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))**

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 systems in Development Planning

## **PAPER-II- POLITICAL GEOGRAPHY**

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))**

**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, Economic, 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 Planning.

## **PAPER III- PRACTICAL- STATISTICAL TECHNIQUES AND GEOINFORMATICS**

**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)

*Manoj K. Singh*

*Department of Geography*

## 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।

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निर्धारित पाठ्यक्रम

प्राचीन एवं भक्तिकालीन काव्य : सम्मिलित कवि – चंदबरदाई, कबीर, जायसी, सूरदास एवं तुलसीदास  
(पाठ्यपुस्तक प्रो. मानवेन्द्र पाठक द्वारा सम्पादित)

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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

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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

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#### 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

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#### 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)

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## 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)

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## VII

सप्तम प्रश्नपत्र - छायावादोत्तर 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)

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## 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)

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## 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।

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### 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)

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### 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

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## 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 घिल्डियाल 'पहाड़ी', यमुनादत्त वैष्णव 'अशोक', पानू खोलिया और सुभाष पंत की कहानियाँ।  
 (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 सांखियाँ 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: संपा० 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: संपा० 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: संपा० रवीन्द्र कुमार जैन (व्याख्या हेतु प्रारंभिक 50 दोहे), नेशनल पब्लिशिंग हाउस, नई दिल्ली।
5. घनानंद: घनानंद कवित्त: संपा० 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

**XIV(ग)**

**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।)

### **XV(क)**

**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

**XV(ख)**

**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)

अथवा

**XV(ग)**

**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 आंशिक 100 पद) टिप्पणी: कबीरदास का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तक से व्याख्या पूछी जाएगी।

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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।

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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।

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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 ।

### **XVI**

#### **(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 ।

10. मशीनी अनुवाद ।
11. अनुवाद की सार्थकता, प्रासंगिकता एवं व्यावसायिक परिदृश्य ।
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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 ।

### **XVI**

#### **(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 ।

**DEPARTMENT OF HISTORY**  
**HNB PG COLLEGE KHATIMA**  
**BA FIRST YEAR**

**Paper 1- Ancient History**

Studying ancient history allows Students to understand where they have come from and why they are here, and by doing so, shows us how the ancients' attempts to shape their futures relate to our own actions in the present day.

**Paper 2-World History**

Through world history, students can learn how past societies, systems, ideologies, governments, cultures and technologies were built, how they operated, and how they have changed. The rich history of the world helps us to paint a detailed picture of where we stand today.

**BA SECOND YEAR**

**paper 1- Medieval History**

The medieval Indian period is an important period for students of history because of the developments in the field of art and languages, culture, and religion. Also, the period has witnessed the impact of other religions on the Indian culture and various political dimensions.

**Paper 2 -World History**

Students can learn about the pillars upon which different civilizations were built, including cultures and people different from their own.

**BA THIRD YEAR**

**Paper 1- Modern History**

Students will be able to understand India in 1707, British Expansion. Changes were introduced by the British. Popular Uprising and Revolts against the British. Socio-Religious Movements. The emergence of Indian Nationalism and India's struggle for independence

## **PAPER 2- INDIAN SOCIETY AND CULTURE**

Education is an important part of a student's life, and it calls for a system designed to support the student's overall development and growth. With the passage of time, conceptualization has improved, resulting in a positive shift in the delivery of knowledge to students. People are looking for more holistic and effective development of their children rather than just focusing on academic excellence. Also, since its inception, modern education has had a significant impact on Indian society and culture. On the one hand, it provided the key to the treasures of modern scientific and democratic thought to the Indian intelligentsia, and on the other hand, it might also disassociate people from their cultural roots, and fade Indian values.

## **MA 1<sup>st</sup> SEMESTER**

### **PAPER 1- WORLD HISTORY (1453- 1648 AD)**

World history is full of stories and facts. Some are inspiring and uplifting; others are chaotic and immoral. Tap into the vivid realm of history, and there are many vital lessons students need to learn. They will study times of suffering and times of joy, and the lessons they learn here can then be applied to their own life experience.

### **PAPER 2 HISTORIOGRAPHY: SOURCE AND EARLY TRENDS**

Historiography is important for a wide range of reasons. First, it helps us understand why historical events have been interpreted so differently over time. In other words, historiography helps students examine not only history itself, but also the broader overlying characteristics that shape the recording of history itself.

### **PAPER 3 - HISTORY OF UTTARAKHAND (FROM THE BEGINNING TO CHAND PERIOD)**

Students need to know about the history of Uttarakhand and its importance. In the Puranas, Uttarakhand was the ancient term for the central Indian Himalayas. Its peaks and valleys were known as *Svargaloka*: a temporary abode of the righteous, and the source of the Ganges. At that time, present-day Uttarakhand was also reportedly inhabited by rishis and sadhus. Uttarakhand is known as "the land of the gods" (Devbhumi) because of its number of Hindu pilgrimage sites.

During the Vedic period, several small republics known as Janapada existed in this region. The Pauravas, Kushanas, Kunindas, Guptas, Katyuris, Palas, Chands, Parmars (or Panwars), and the British have ruled the state by turns.

#### **PAPER 4- POLITICAL AND ECONOMIC HISTORY OF DELHI SULTANATE (AD 1206-1526)**

The Delhi Sultanate is very important for students because it started the Muslim Rule in India. Before that, it was the Rajputs under Prithiviraj Chauhan who ruled over Delhi and the surrounding areas. The start of Muslim rule brought in great cultural diversity which became an important and invaluable feature of our country.

#### **PAPER 5 - SOCIETY AND CULTURE OF INDIA**

The medieval period is an important era in Indian History for the development in the field of art, languages, culture, and religion, so students need to know about this period

Studying history opens up amazing avenues for a career. History is an academic discipline dealing with the study of societies and cultures of a certain time period or long periods of time, to enhance our understanding of the past.

A degree in history provides you with a set of transferable skills that are applicable to a wide range of careers such as law, publishing, journalism and the media, museums, librarianship and archive work, teaching, advertising, work in the development sector, global charity work, Civil Services, and other competitive examinations and Academic Research fields, etc. Having a degree in history, you can specialize in various fields. At the graduate and postgraduate levels, most of these courses are offered nationwide.

A history degree, backed by specialization at the Master's level, can pave the way to a number of careers. Here are eight career options you can go for after a degree in History:

##### **1. ARCHAEOLOGY**

The work of an archaeologist can be research-based or field-related. It includes excavation, but that is only one aspect of archaeology. You are free to specialize in particular objects of study. For instance, you can be an expert on coins called a numismatist, or an epigraphist who decipher

inscriptions. The Archaeological Survey of India (ASI) employs archaeologists and is entrusted with the maintenance of 3,600 monuments, state departments of the archaeology of different state governments, heritage bodies, museums, and other research institutions.

## **2. MUSEOLOGY**

Museologists or specialists in museology are the ones who deal with the design, organization, and management of museums. Their work is filled with research, administration, and public relations. For instance, The National Museum Institute (New Delhi) offers master's in Museology.

## **3. MUSEUM CURATORS**

Museum curators specialize in natural history, metals, terracotta, textiles, paintings, and other related things. The field requires an artistic and aesthetic bent of mind along with administrative skills. It also includes maintenance of records of each item, for instance, from where it has been discovered or acquired, its estimated age, conservation treatment, and such details.

## **4. ARCHIVISTS**

Archivists are experts in preservation, repairing parchment and paper manuscripts, and microfilming documents. They get work in museums, libraries, the National Archives of India, and different state archives.

## **5. HISTORIANS**

A historian's job is to study and research history, and communicate it through written or published works. The prerequisite to becoming a historian is a bachelor's degree in history followed by a Masters in specific areas such as political history, military history, etc.

## **6. HISTORY EXPERTS**

There is a tremendous demand for History experts in movie houses as well who could undertake research work for costumes, jewelry, and movie sets. These experts work closely with both the director and the cinematographer. A history expert can go for a production house as a research analyst as well.

## **7. TEACHERS**

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 ।

### **XVI**

#### **(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 ।
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- 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 ।

SEM 4th

MAY -401	Yoga therapy	<ul style="list-style-type: none"> <li>• Student will learn how to cure different diseases with the help of yogic practices.</li> </ul>
MAY -402	Teaching methodology in yoga	<ul style="list-style-type: none"> <li>• In this paper students will learn about how they can conduct their yoga class in different interesting manner.</li> <li>• They will learn how to apply teaching techniques in their classes.</li> </ul>
<b>Elective subjects</b>		
MAY -403	Marma therapy	<ul style="list-style-type: none"> <li>• In this paper students will learn about marm therapy to cure disease.</li> </ul>
MAY -404	Principles of Ayurveda	<ul style="list-style-type: none"> <li>• Students will come to know about various herbal medicines, special diets, medicinal herbs and oils</li> </ul>
MAY -405	Applied Yoga	<ul style="list-style-type: none"> <li>• With the help of this paper student will understand how to apply their yoga knowledge in the felid of health, sport and physical education.</li> </ul>
MAY -406	Dissertation	<ul style="list-style-type: none"> <li>• Student will choose particular topic for their research work.</li> </ul>
MAY -407	Practical-1	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asana, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
MAY -408		<ul style="list-style-type: none"> <li>•</li> </ul>





**MA**  
**(Yoga and Alternative  
Therapies)**

**DEPARTMENT OF YOGIC SCIENCE**  
**H.N.B.PG.COLLEGE, KHATIMA**  
**KUMAUN UNIVERSITY NAINITAL**  
**(UTTARAKHAND)**

S. N.	Code		<i>Outcomes</i>
1	MAY – 101	Fundamentals of Yoga	<ul style="list-style-type: none"> <li>● Students of the UG course will have an understanding of Yoga, its origin, history and development of Yoga.</li> <li>● Introduction of Yoga according to various texts.</li> </ul>
2	MAY –102	Principles of Hath Yoga	<ul style="list-style-type: none"> <li>● Students will know about the all hath yogic scriptures, and get to know their different perceptive aspect about yogic practices. With the help of hath yoga techniques, students will get holistic health</li> </ul>
3	MAY –103	Human Anatomy & Physiology	<ul style="list-style-type: none"> <li>● The objectives behind teaching Anatomy and Physiology is to</li> <li>● Make students familiar with the systems of the body.</li> <li>● Give a hand on experience about the human body using models, charts and pictures.</li> <li>● Make students understand the organization of the body with respect to structural components.</li> </ul>
4	MAY –104	Bases of Psychology	<ul style="list-style-type: none"> <li>● Students will learn different perceptive of human psychology like- learning, emotion, motivation, intelligence, dream etc.</li> </ul>
5	MAY –105	Practical-1	<ul style="list-style-type: none"> <li>● Make the students aware of the asana for physical fitness and healthy life.</li> <li>● Know and understand about breathing practices.</li> </ul>
6	MAY –106	Practical-2	<ul style="list-style-type: none"> <li>● Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

## SEM 2

L = Lecture    T = Tutorial    P = Practical    CT = Cumulative Test    TA = Teacher Assessment

MAY –201	Patanjal Yoga sutra	<ul style="list-style-type: none"> <li>• Understand various modification of mind and the means of inhibiting them.</li> <li>• Have an understanding about the essence of Samadhi and Sadhana Pada.</li> <li>• Understand the essence of Vibhuti and Kaivalya pada.</li> </ul>
MAY –202	Yoga and Mental Health	<ul style="list-style-type: none"> <li>• Students will learn about mental health and mental disorders and relationship between yog and mental health.</li> </ul>
MAY –203	Alternative therapies	Students will come to know about the treatment of common ailments through alternative therapy.
MAY –204	Yoga in Upnishadas	<ul style="list-style-type: none"> <li>• Students will come to know about Indian Philosophy,upnishad and culture. Have an idea about the major principal Upanishads</li> <li>• Understand the essence of each Upanishad and how to put them into practice.</li> <li>• Understand each Upanishad and the role of it in our day to day life.</li> </ul>
MAY –205	Practical-1	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
MAY –206	Practical-2	<ul style="list-style-type: none"> <li>• In this practice student will make lesson plans for conducting the classes.</li> <li>• Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

**SEM 3rd**

MAY -301	Research Methodology& Statistics in Yoga	<ul style="list-style-type: none"><li>• In this paper students get to know about all the aspects of research like research procedure ,statistical analysis etc.</li></ul>
MAY -302	Principles of Naturopathy	<ul style="list-style-type: none"><li>• Students will learn about the nature cure treatment. Students learn mud therapy, hydrotherapy, fasting ,massage etc.</li></ul>
<b>Elective subjects</b>		
MAY -303	Essay E-III	<ul style="list-style-type: none"><li>• In this paper they overlook all the aspect of yoga.</li></ul>
MAY -304	Yoga & Personality Development E-IV	<ul style="list-style-type: none"><li>• Students will learn different aspects of personality , measurements of personality etc.</li></ul>
MAY -305	Yoga and personal Management	<ul style="list-style-type: none"><li>• Students will get to know how they will manage themselves like:- self management, self confidence, will power, etc</li></ul>
MAY -306	Yoga and health E-VI	<ul style="list-style-type: none"><li>• Students will study about health, diet, chakras, kundalini, panchprana and yogic management of different diseases.</li></ul>
MAY -305	Practical-1	<ul style="list-style-type: none"><li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li></ul>
MAY -306	Practical-2	<ul style="list-style-type: none"><li>• Research project work and advance practices of shatkarma and mudra and bandha make students more capable and knowableable.</li></ul>

**DEPARTMENT OF MATHEMATICS**  
**H.N.B. PG COLLEGE KHATIMA**

**Programme Outcomes (POs)**

The Students of mathematics studying at Under Graduate and Post Graduate level are prepared to enrich their knowledge in :

**PO-1** : Framing practical real life problem with the help of Mathematics and operation research.

**PO-2** : Finding the solution of problem and taking appropriate decision on them using different techniques and formulae used in Mathematics, Statistics and operation research.

**PO-3** : Understanding and handling of software like MS OFFICE, EXCEL ORIGIN, MATLAB etc. dealing with the problems.

**PO-4** : Delivering the knowledge acquired in the form of presentation and documentation with the society and colleagues effectively.

**PO-5** : Working efficiently towards a project in a team or to frame their own project dealing with real life problem in a competent world.

**PO-6** : Collecting research literature in framing new research problem, formulating the problem in mathematical form, finding their solution numerically and graphically with the different methods analytically or using MATLAB, EXCEL etc. and interpreting their results. **PO-7** : Different technological and industrial applications of nuclear reactors, solar collectors, electronic cooling and food mixing are greatly influenced by the nanofluids due to their increasing thermal conductivity and stability property. In the fields of engineering space technology and the processes taking place at a very high temperature, the importance of radiative heat transfer is observed. The nanofluid flow affects the heat and mass transfer flow in a medium. The students are given main thrust to formulate real world problems related to the nanofluid flow and to find the solution numerically and interpret its result in the social life for the society. These problems require the uses of EXCEL, ORIGIN and MATLAB etc.

*Bhatt*

**Programme Specific Outcome (PSOs)**

The students of mathematics background after passing at Under Graduate and Post Graduate level will be able to:

**PSO-1** : Get admission for further studies like research in Mathematics, Statistics or Operation Research in other reputed National and International Institutions.

**PSO-2** : Find the excellent jobs in Government/Public / Private Institutions in India/Abroad and will serve for the society and nation.

**PSO-3** : Find a place in the society to furnish the jobs for the people in need.

**PSO-4** : Form a project dealing with the real life situation happening around us by using mathematical aspects and find its solution which will be helpful for the people.

*Bhatt*

**PG DIPLOMA**  
**(Yoga and Alternative**  
**Therapies)**

**DEPARTMENT OF YOGIC SCIENCE**  
**H.N.B.PG.COLLEGE, KHATIMA**  
**KUMAUN UNIVERSITY NAINITAL**  
**(UTTARAKHAND)**

## 1<sup>st</sup> SEMESTER

<b>S.N.</b>	<b>Sub Code</b>	<b>Title of the Paper</b>	<b>OUTCOME</b>
1	DYAT-101	Introduction of Human Consciousness and Yoga	<ul style="list-style-type: none"><li>• Students of the UG course will have an understanding of Yoga, its origin, history and development of Yoga.</li><li>• Introduction of Yoga according to various texts.</li></ul>
2	DYAT-102	Hath Yoga	<ul style="list-style-type: none"><li>• Students will know about the all hath yogic scriptures, and get to know their different perceptive aspect about yogic practices.</li><li>• With the help of hath yoga techniques, students will get holistic health.</li></ul>

3	DYAT-103	Teaching Methodology in Yoga	<ul style="list-style-type: none"> <li>In this paper students will learn about how they can conduct their yoga class in different interesting manner.</li> <li>They will learn how to apply teaching techniques in their classes.</li> </ul>
4	DYAT-104	Human Anatomy & Physiology	<ul style="list-style-type: none"> <li>To know about the structure of the body</li> <li>To know about the necessary functions of the body</li> <li>To give brief idea about the diseases related to each system</li> <li>To throw light on anatomy so that student can experience the involvement of their body parts while practicing various postures of yoga.</li> </ul>
5	DYAT-151	Practical – I	<ul style="list-style-type: none"> <li>Make the students aware of the asana and pranayama for healthy life.</li> <li>Know and understand about shatkriya practices for purify whole body.</li> </ul>
6	DYAT-152	Practical – II	<ul style="list-style-type: none"> <li>In this practice student will make lesson plans for conducting the classes.</li> <li>Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

## 2<sup>nd</sup> SEMESTER

S.N	Sub Code	Title of the Paper	OUTCOME
1	DYAT-201	Patanjal Yoga	<p>Following the completion of this course, students shall be able to</p> <ul style="list-style-type: none"> <li>Understand various modification of mind and the means of inhibiting them.</li> <li>Have an understanding about the essence of Samadhi and Sadhana Pada.</li> <li>Understand the essence of Vibhuti and Kaivalya pada.</li> </ul>



2	DYAT-202	Yoga & Health	<ul style="list-style-type: none"> <li>• Student will come to know about what is the actual meaning of health according to Indian scriptures; student will come to know about holistic health.</li> <li>• "Diet is medicine" mean knowledge of diet therapy given to this paper.</li> </ul>
3	DYAT-203	Naturopathy	<ul style="list-style-type: none"> <li>• Students will learn about the nature cure treatment. students learn mud therapy, hydrotherapy, fasting, massage etc.</li> </ul>
4	DYAT-204	Yoga and Alternative Therapy	<ul style="list-style-type: none"> <li>• Students will come to know about alternative therapies to cure diseases.</li> <li>• Alternative therapies like Pranic healing, Magnet therapy, Acupressure, Yagya therapy, Medicinal plant therapy, swara therapy etc.</li> </ul>
5	DYAT-251	Practical – I	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
6	DYAT-252	Practical – II	<ul style="list-style-type: none"> <li>• Assignment on any Five Alternative Therapies will help student to get deep knowledge of treatments of diseases.</li> </ul>



# DEPARTMENT OF PHYSICS

## HNB PG COLLEGE KHATIMA

**PROGRAM OUTCOMES (POS):** The Physics department offers two programs:

1. Physics for B.Sc. students of PCM.
2. M.Sc. Physics.

Both these programs are primarily geared towards cultivating the idea – “*Physics is the study of nature and its laws (till the most fundamental level)*”, amongst the students. The Program Specific Outcomes (PSOs) and the Course Outcomes (COs) of the individual programs/courses/papers are more or less spun around this theme and are listed below.

**Program Specific Outcomes (PSOs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM)

**PSO1:** Understanding the fundamental concepts of Physics and its basic laws.

**PSO2:** Acquire the necessary mathematical tools and concepts required for understanding the underlying physics.

**PSO3:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical).

**PSO4:** Acquire problem solving skills and ability to apply them to real world physical phenomenon.

**PSO5:** Motivation to pursue higher studies (Postgraduate, Research etc.) in Physics.

**Course Outcomes (COs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM).

<b>Mechanics and Theory of Waves and Oscillations</b>	Understanding vector analysis (applying concepts for problem solving), the nabla operator (Gradient, Divergence & Curl), Differentiation and Integration of Vectors (fields), Integral Theorems (Gauss, Stokes, Green and corollaries). Understanding - Frame(s) of Reference, Newton's Laws (along with application for point particles as well as system of particle), (conservative) force and potential energy, Work-Energy Theorem, Rocket motion.
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Understanding quantities and ideas related to rotational motion- Angular Velocity, Angular momentum, Torque, Moment of Inertia (calculations and related theorems), Conservation of Angular Momentum.

Understanding Newton's law of gravitation, Gravitational Field, Potential & Potential Energy, Central force, Kepler's Laws of Planetary motion, Satellite and Planetary orbits and motions.

Understanding material properties such as elasticity, stress, strain, various elastic constants and their relationships, Experimental methods to determine the various elastic properties.

Understanding fluids at rest (surface tension, excess pressure) as well as in motion (viscosity, flow through capillary tube, Bernoulli's theorem, Poiseuille's formula), Experimental methods to determine surface tension and viscosity.

Understanding Simple Harmonic Motion, the Harmonic Oscillator Equation and solutions, Linearity and Superposition principle, Superposition of Harmonic Oscillations- Collinear(Interference & Beats) and Perpendicular (Lissajous Figures).

Understanding waves and wave motion, Waves on a string (travelling and standing), Normal-modes, Group and Phase velocities. Understanding the Fourier Theorem and its applications.

Understanding Damped Harmonic Oscillations, Over/Under/Critical damping, Relaxation time, LCR circuit.

Understanding Forced Harmonic Oscillations, Transient and Steady state behavior, Resonance and Sharpness, Bandwidth, Quality Factor.

Understanding intensity and loudness of sound waves, Decibels, Ultrasonic waves (generation, detection and uses), Building acoustics, Reverberation time and Sabine's formula, (Acoustic) design of buildings.

<p><b>Electricity and Magnetism</b></p>	<p>Understand the basic concepts of Electrostatics-Field, Flux, Gauss's Theorem with applications, Potential and relation with Field, Potential Energy. Also concept of conductors, dielectrics and capacitance, The Electric-Vector.</p> <p>Understand the basic concepts of Magnetostatics- Biot-Savart's Law and applicatons, The Lorentz Force law, Div and Curl of magnetic field and the magnetic vector potential, Ampere's circuital law, Magnetism in matter (Magnetization, Permeability, Susceptibility) and Types of Magnetic materials (Dia, Para &amp; Ferro). Understanding inductance (self and mutual and induction), Faraday's Law, Lenz' Law &amp; energy conservation, AC circuits- RC, LC and LCR, Resonance.</p> <p>Realizing that EM is contained in the 4 Maxwell's Equations, Understanding equation of continuity, displacement current, Maxwell's correction to Ampere's circuital law. Gain knowledge on EM waves, propagation and their properties using Maxwell's equations, Polarization of EM Waves.</p>
<p><b>Practical (B.Sc. !st Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 1 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Momentof Inertia, Elastic constants, Simple &amp; Compound pendulums, Current, Voltage, Resistances, Solenoid, LCR circuit, SHM, Normal modes of a string etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>
<p><b>Heat Thermo dynamics &amp; Statistical Physics</b></p>	<p>Understanding the basic thermodynamic concepts- State variable, Equilibrium, Heat, Work, Zeroth and First Laws and the concepts of Temperature and Internal Energy, Applications of First Law to various processes (Adiabatic, Isothermal etc.), Mayer's relation.</p> <p>Understanding the need of second law of thermodynamics, Reversible &amp; Irreversible processes, Heat Engine and Refrigerator, Second Law of Thermodynamics (in term of Engines and refrigerators), concept of entropy, the Carnot cycle, second law in terms of entropy change, the Nernst theorem.</p>

Understanding the four thermodynamic potentials, The Maxwell's relations and applications (response functions, Joule-Thompson cooling, Calusius-Clapeyron equation etc.)

Understanding the Kinetic Theory of Gases (towards a microscopic description), Maxwell's velocity distribution law, transport phenomenon, the classical equipartition theorem and its use to determine specific heats of mono-atomic and diatomic gases.

Understanding Blackbody radiation (the first step towards quantum mechanics), Spectral emissive power, Energy Density of Cavity Radiation, The Rayleigh-Jeans Law, Planck's law and deducing Wien's displacement law, Wien's distribution laws (1<sup>st</sup> and 2<sup>nd</sup>), Stefan-Boltzmann law and Rayleigh-Jeans from it.

Understanding Basic postulates of Statistical Physics, Macro and Micro States, Phase Space, Density distribution in phase space,  $\mu$  space representation and its division, Statistical average values, Condition of equilibrium, Stirling's Approximation, Entropy and Thermodynamic probability, Boltzmann entropy relation. Ensembles, Micro -canonical, Canonical and Grand Canonical ensembles, Statistical definition of temperature and interpretation of second law of thermodynamic, Pressure, Entropy and Chemical potential. Entropy of mixing and Gibb's paradox, Partition function and Physical significances of various statistical quantities.

Understanding Maxwell-Boltzmann statistics and Distribution law, Energy distribution function, MaxwellBoltzmann law of velocity distribution (most probable velocity, average velocity, RMS velocity), Limitations of M-B statistics, Elementary idea of quantum statistics.

<p><b>optics</b></p>	<p>Understanding Geometrical Optics- Fermat's principle of extremum path and applications, Cardinal points, Combination of Lenses, Lagrange equation of magnification.</p> <p>Understanding optical instruments- Eye pieces (Ramsden's, Huygen's and Gaussian), Aberrations (and types) and their corrections.</p> <p>Understanding the Interference of Light- The superposition principle, Coherence and conditions for interference, Double slit interference, Division of amplitude and division of wavefront, Fresnel's Biprism, Phase change upon reflection, Thin-film interference (Haidenger and Fizeau fringes), Newton's rings (theory and experimental setup), The Michelson Interferometer and its (experimental) use, Fabry-Perot interferometer.</p> <p>Understanding diffraction of light- Fresnel diffraction, Half-period zones and zone-plate, Diffraction pattern of edge, slit and wire, Fraunhofer diffraction (single, double and multiple slits), The diffraction grating as a measurement tool.</p> <p>Understanding polarization of light- Transverse EM Wave, Plane polarized light (production and analysis), Malus Law, Brewster's Law, The Nicol Prism, Circularly and Elliptically polarized light, Optical rotation, The polarimeter (experimental setup also).</p>
<p><b>Practical (B.Sc. 2<sup>nd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 2 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about thermal conductivity, blackbody radiation, calorimetry, statistical probabilities, dispersion, interference, gratings, lens combinations, polarization etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

**Modern  
Physics**

Understanding the origins of quantum theory- Blackbody radiation and early radiation laws, Planck's (revolutionary) idea (the quantum hypothesis & birth of quantum mechanics), Photoelectric and Compton effects. waves and their wavelength, Davisson-Germer Experiment, Wave-particle duality, The uncertainty principle (position-momentum and Energy-time), Interference experiments with particles.

Understanding the Schrodinger's equation (quantum mechanical equation of motion), Time dependent and time-independent versions, Framework of QM (postulates, wavefunction- properties and physical significance), Probability and Conservation, Operators, Eigenfunctions and Eigenvalues, Expectation values, The free particle wavefunction.

Learning to solve the Schrodinger's equation, Stationary states, Boundary conditions lead to quantization, Potential Step & Barrier and transmission, Potential well (infinite and finite depths), The one dimensional harmonic oscillator in QM, Zero point energy.

Learning to solve the Schrodinger's equation in three dimensions (for spherically symmetric systems), The Schrodinger's equation for the Hydrogen atom and solving it using separation of variables, Angular momentum eigenfunctions (spherical harmonics), Solving the radial equation using Frobenius's method, Emergence of the various quantum numbers (n, l and m).

Understanding the various atomic models- Thomson, Rutherford and Bohr, the Bohr model and the hydrogen spectra, Other quantum ideas/experiments- Bohr-Sommerfeld model and quantization condition, the Stern-Gerlach experiment and electron spin, Electron magnetic moment, Bohr magneton, Larmor's precession, The vector atom model, Space quantization.

Understanding optical spectra (on the basis of the vector atom model), LS and JJ couplings, Selection and Intensity Rules, The fine structure of sodium D lines, Magnetic interactions and Zeeman effect, X-ray spectra and

	<p>Moseley's Law.</p> <p>Understanding basics of radiation, Absorption and Emission (spontaneous and stimulated), The Einstein's A and B coefficients, Metastable states (long living), Population inversion, Pumping, Lasing action and Laser/Maser.</p> <p>Understanding Franck-Condon Principle, Molecular spectra, Rotational, Vibration and Electronic spectra of diatomic molecules, General features of electronic spectra, Luminescence, Basics of Raman effect.</p> <p>Understanding the atomic nucleus, Constituents of the nucleus, properties, Nature of nuclear force, Binding Energy and BE curve, Stable nuclei, The semi-empirical mass formula, Models of the nucleus (Liquid drop and Shell model), elementary particles and their classification schemes.</p>
<p><b>Electronics</b></p>	<p>Understanding Kirchoff's Laws, Superposition Theorem, Constant voltage source and constant current source, Conversion of voltage source into current source, Thevenin's Theorem and procedure for finding thevenin equivalent circuit, Norton's Theorem and procedure for finding Norton equivalent circuit, Maximum power transfer theorem, Applications of Network Theorems, Four terminal Network and h-parameters.</p> <p>Understanding elementary semiconductors and devices (intrinsic, extrinsic-P &amp; N), the PN diode and its characteristics in forward and reverse bias, Zener diode, Optoelectric devices- LEDs, Photodiode and Solar cell.</p> <p>Understanding diode circuits- The rectifier- Half-wave, Full-wave (Centre tapped and Bridge versions), Ripple factor and Efficiency, Filters (C, L, Pi etc.), Clipping and Clamping circuits using diodes, Voltage multipliers, Zener diode and voltage regulation.</p> <p>Understanding transistors and amplifiers- Bipolar Junction transistors (NPN, PNP), Characteristics (input and output) in various configurations (CE, CB &amp; CC), Current gains alpha and beta and their relation, Load line analysis, Q-point, Active, Cutoff and Saturation regions, Transistor biasings; Transistor Amplifiers- Voltage, Current and Power, Class A, B and C amplifiers; The Field Effect Transistor (FET) and the Uni-Junction</p>



	<p>Transistor (UJT)</p> <p>Understanding Oscillator circuits- Feedback (negative and positive), Birkhausen's criterion, RC (Wein bridge and Phase-Shift) &amp; LC (Collector tuned and Colpitt) oscillators and frequency of oscillation, Crystal oscillators, The Multivibrator and various operation modes (Monostable, Astable and Bistable).</p> <p>Understanding Digital Electronics and Circuits- Number systems (Binary etc.) and conversions, Basic Logic Gates (AND, OR &amp; NOT) and realizations using diodes and transistors, Universal Gates (NAND &amp; NOR), Other gates, Boolean Algebra- De Morgan's Theorem, Simplifying logic circuits, Minterm, Maxterm, SOP and POS, Karnaugh Map, Binary arithmetic (addition, subtraction) using circuits- Half/Full adders, Word (4-bit) binary adder-subtractor</p>
<p><b>Practical (B.Sc. 3<sup>rd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 3 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Energy quanta, quantization, diodes, LEDs, rectifiers, power supplies, transistors, amplifiers, oscillators, logic gates, Boolean algebra, logic circuits etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

## **PROGRAM SPECIFIC OUTCOMES (PSOs): FOR M.SC. PHYSICS**

**PSO 01:** Strengthening and further understanding of the fundamental concepts of Physics and its basic laws (as acquired during the Under-graduate studies) by augmenting mathematical rigor (at the Physicists level) along with Physical interpretations (and clear physical picture(s)) of any theory/process/situation.

**PSO 02:** Acquire the necessary mathematical-tools (analytic, approximate, numerical, graphical etc.) and concepts required for understanding the underlying physics and use them to solve complex and advanced problems (including those with real world applications).

**PSO 03:** Gain substantial knowledge in the various (core) branches of Physics- viz. Classical Mechanics, Electrodynamics, Mathematical Methods, Quantum Mechanics, Statistical Mechanics, Condensed Matter Physics, Astrophysics, Electronics, Nuclear Physics, Particle Physics etc.

**PSO 04:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical). Also gradually develop the scientific method by designing and conducting experiments.

**PSO 05:** To get an exposure to research and research methodology during the dissertation work (theoretical and/or experimental) to be performed during the last semester.

**PSO 06:** Motivation to pursue a research/academic career in Physics. Aim towards writing and qualifying in various competitive exams- (e.g. CSIR-UGC-NET, GATE, JEST, BARC, DRDO, Entrance exams of premier research institutes (National & International)).

**PSO 07:** Gain knowledge of the subject along with general competence and analytical skill for employment in other sectors viz. industry, R&D, consultancy, public administration etc.

## COURSE OUTCOMES (COS): FOR M.SC. PHYSICS

<p><b>Mathematical Physics</b></p>	<p>To learn series solution of differential equations, Legendre, Bessel, Hermite, and Laguerre differential equation and related polynomial, physical integral form of polynomials and their orthogonality relations. Generating Function and recurrence relation.</p> <p>Understanding curvilinear Coordinates and various operators in circular, cylindrical and spherical coordinate systems, classification of Tensors, Rank of a Tensor, covariant and contra-variant tensors, symmetric and anti-symmetric Tensors, Kronecker delta symbol. Contraction of Tensor, metric Tensor and Tensor densities, covariant differentiation and Geodesic equation.</p> <p>Understanding function of complex variable, Cauchy's Riemann differential equation, Cauchy's integral theorem, residues and Cauchy's residues theorem, singularities, evolution of residues and definite integral.</p> <p>Understanding Fourier integral and Fourier Transform, Fourier integral theorem, finite and infinite integral, Laplace transform of elementary function (Dirac delta &amp; Green's function), Solution of simple differential equations.</p>
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<p style="text-align: center;"><b>Classical Mechanics</b></p>	<p>Understanding mechanics of a system of particles (Constraints and generalized coordinates, D Alembert's principle, Lagrange equations for holonomic and non-holonomic systems and their applications, conservation laws of linear momentum, energy and angular momentum.</p> <p>Understanding Lagrangian and Hamiltonian Formulations with their applications to various conservative systems, Hamilton Jacobi theory.</p> <p>Understanding Dynamics of rigid bodies including Motion of a rigid body, body and space Reference system, angular momentum and Inertia tensor, Principle axes- Principle moments of Inertia, spinning tops, Euler angles, Infinitesimal rotations.</p> <p>Understanding Central force problem including Action and angle variables, phase integral, small oscillations, Kepler's laws of Planetary motion and their deduction, scattering in a Central field, Rutherford scattering cross section.</p>
<p style="text-align: center;"><b>Quantum mechanics</b></p>	<p>Understanding that our world is inherently quantum and so the proper framework to understand it is Quantum Mechanics.</p> <p>"Establishing"/Understanding the basic framework of QM(Schrodinger's equation, wavefunction and probabilistic interpretation, uncertainty relations etc.).</p> <p>Learning to solve the Schrodinger's (time-independent) equation (various one and three dimensional problems).</p> <p>Understanding the various formulations of QM and their equivalence- Schrodinger, Heisenberg (Matrix) and Dirac formulations.</p> <p>Understanding symmetry in QM- Space and Time translation symmetries as well as Rotational symmetry (Angular momentum, Spin, Addition etc.)</p> <p>Understanding the various approximation methods to solve the Schrodinger's equation (Perturbation, Variational method, WKB approximation) and application to different (stationary) state problems.</p> <p>Applying approximation methods to time dependent problems and treatment of radiation (emission and absorption) via such methods</p>

	<p>(Time dependent perturbation theory, Fermi's Golden Rule, the Semiclassical theory of radiation etc.).</p>
<p><b>Statistical Mechanics</b></p>	<p>Understanding the (average) microscopic description vs. the macroscopic description (as done in Thermodynamics) for a system with large no. of degrees of freedom.</p> <p>Understanding (and calculating within the framework) the various statistical ensembles and the corresponding (thermodynamic) formulations.</p> <p>Application of the statistical ideas to derive/understand the behavior of gases (ideal as well as real).</p> <p>Understanding the basics of Quantum SM (FD &amp; BE stat) and some simple applications.</p> <p>Understanding blackbody radiation as a gas of photons (i.e statistical treatment- BE statistics).</p>
<p><b>Atomic &amp; Molecular Physics</b></p>	<p>Understanding that optical properties of materials and realizing the fact that it are just an application of Quantum Mechanics to atomic/molecular systems.</p> <p>Understanding the atomic and molecular spectra along with their finer features (Fine structure, Vibrational-Rotational spectra).</p> <p>Understanding the effect of electric and magnetic fields on the various spectra via interactions (or charge and/or spin).</p> <p>Understanding the various theories/formulations/models to understand spectra (Vector atom model, LS, JJ coupling schemes, Raman spectroscopy, Heitler-London and Born-Oppenheimer treatments etc.)</p> <p>Understanding the quantum theory of radiation (Einstein's coefficients) and basic working principle of Lasers.</p>

<p><b>Practical (Sem1)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 1<sup>st</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. CRO, SCR, Transistors, Diodes, FET, Amplifiers, Oscillators, Antennas, Amplitude modulation/demodulation etc.). The student should use and develop “hand-skills”, observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>General relativity and cosmology</b></p>	<p>Understanding Christoffels connection as Einstein's connection, Gravitational action, field equations and their general properties, Newtonian limit of Einstein's field equations, Metric in spherically symmetric space-time (Schwarzschild metric), Orbits in the Schwarzschild metric, gravitational collapse of a dust sphere, Schwarzschild black holes.</p> <p>Introduction of Gravitational radiation, Wave equation in linearized theory and plane waves, propagating modes of gravity, gravitational waves in a flat space-time background, propagation of gravitational waves in the curved space-time, Energy and momentum of the gravitational waves, Detection of gravitational waves.</p> <p>Basic Concepts and elementary idea of big-bang and steady state cosmologies, Seagull static models, Cosmological principle, Friedmann space-time, Robertson-Walker line element, Weyl's postulate, expansion of the universe, Hubble's law, dynamical equation of cosmology</p> <p>and their consequences, the primordial fire and the remnant radiation, Big-bang and steady state models of the universe.</p>

<p style="text-align: center;"><b>Advanced Quantum Mechanics</b></p>	<p>Understanding, applying and formulating QM at an even deeper level than done earlier (in the QM Course).</p> <p>Applying quantum ideas to understand the scattering of particles. Employing various (approximate) methods- Partial Wave Analysis and the Born approximation.</p> <p>Understanding notion of identical and indistinguishable. Realizing origin of the Pauli's exclusion principle and related notions (Spin-Statistics connection, Permutation symmetry etc.) Formulation (along with the need) of the relativistic version of (NR) quantum mechanics.</p> <p>Working out in detail the two basic relativistic wave equations (Klein-Gordon and Dirac equations) and the various associated phenomenon/notions (Plane wave solutions, Negative Energies and Probabilities, Spin of electron and its magnetic moment, The Hole Concept, Particles and Antiparticles etc.)</p> <p>Understanding the need of relativistic quantum fields (towards Quantum Field Theory), Field formulations for the various wave equations via 2nd quantization.</p>
<p style="text-align: center;"><b>Nuclear Physics</b></p>	<p>Understanding the atomic nucleus and its various properties along with the experimental tools and techniques of nuclear investigations.</p> <p>Understanding basic properties of the nucleus and the various nuclear models.</p> <p>Understanding the nature of the nuclear force along with experimental setup(s) to study them. Understanding radioactive decay and its various feature.</p> <p>Understanding nuclear reactions by applying (mainly) quantum ideas to them.</p>

<p style="text-align: center;"><b>Elementary Particle Physics</b></p>	<p>Get a basic understanding of the fundamental constituents of our Universe (the “elementary” particles and the four fundamental interactions).</p> <p>Understanding the gauge principle and role of symmetry (along with ideas of unification). Understanding the common (mathematical) origin of (the various) conservation laws as a manifestation of (some) symmetry.</p> <p>A very basic understanding of the unification of the fundamental interactions- Electroweak and Grand Unifications.</p> <p>Understanding (hadronic) matter as composed of quarks and the “construction” schemes (i.e. various direct-product representation of SU(3)). An overview of the various properties of quarks (and also of the composite mesons and baryons).</p>
<p style="text-align: center;"><b>Condensed Matter Physics</b></p>	<p>Understanding of the basic (theoretical) ideas involved in the study of Condensed Matter Physics.</p> <p>Understanding the origin of elasticity (and elastic constants) from the properties of the underlying crystal structure.</p> <p>Understanding the interaction of crystals with radiation (X-rays) and the related theoretical framework as well as experimental setup(s) (Diffraction experiments).</p> <p>Understanding the quantum treatment of elastic/sound waves (i.e. the idea of phonons and phonon gas etc.)</p> <p>Understanding the thermal properties of solids on the basis of the phonon picture.</p> <p>Understanding crystal defects, superconductivity, and magnetism.</p>



<p><b>Practical (Sem2)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 2<sup>nd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. oscillators, electronically regulated power supply, negative feedback amplifiers, FET characteristics, Michelson Interferometer, Fabry Parot Interferometer, four probe method, Fresnel's Law, Magnetic susceptibility, Radiation laws, etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics I</b></p>	<p>Understanding Integrated Circuit technology, Classification of IC's, Fabrication of IC's &amp; components, Basic monolithic integrated circuit technology, processes used in monolithic technology, active &amp; passive components, metal semiconductor contact, thick &amp; thin film IC's, hybrid IC's, charge coupled devices (CCD), advantages &amp; limitations of integrated circuits. Understanding Operational amplifiers (Linear and Non-linear Analogsystems),</p>

<p style="text-align: center;"><b>Advanced Electronics II</b></p>	<p>Understanding Digital communication, Digital signal processing, Image processing (Basic ideas only), Pulse Modulation systems, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse position modulation, Pulse code modulation, Delta modulation Frequency division multiplexing (FDM), Basic idea of digital telemetry.</p> <p>Learning Optical communication, Principle of optical communication, Different modes of propagation of E. M. Wave through optical fibre, Brief concept, classification of fibres and ray path, Advantages of multimode fibres and cladding , Optical Fibre connectors, Optical Fibre communication Receiver, Brief Introduction , Signal path through optical data link, Block diagram of optical Receiver, Advantages of optical communication, Light propagation in cylindrical wave guide.</p> <p>Gaining knowledge of Memory and optoelectronic devices, Bulk and thin films. Photoconductive devices (LDR), Memory devices, static and dynamic random access memories SRAM and DRAM, CMOS and NMOS, nonvolatile-NMOS, magnetic, optical and ferromagnetic memories, charge coupled devices (CCD), LCDS.</p>
<p style="text-align: center;"><b>Electrodynamics</b></p>	<p>Realizing the unification of Electricity and Magnetism as a single physical concept- Electromagnetism (or Electrodynamics) and that Maxwell's equations express this fact. Understanding various electromagnetic phenomenon (EM Wave in vacuum, conductors, non-conductors, plasma, bounded media, wave guides).</p> <p>Understanding the potential formulation of ED (and its advantages).</p> <p>Understanding generation and nature of radiation (fields) from moving (accelerated) charges. Formulating ED (and writing and performing calculations) within the relativistic framework i.e. four-vector &amp; Tensor notations. Understanding the role of this relativistic formulation and ability to apply it elsewhere.</p>

<p><b>Practical (Sem 3)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 3<sup>rd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of this semester (Richardson's Law, ESR spectra, Hall effect, multivibrators, transistor amplifiers cum feedback amplifiers, FET and MOSFET, VTVM etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics 3</b></p>	<p>Understanding power supply regulation including Servomechanism, regulation using OA, Zener reference source, The 723 regulator current regulator, short circuit and over load protection, Precision rectifier, IC regulated power supply. Three terminal voltage regulations, dual Polarity regulated power supplies using 78 XX and 79 XX series regulators, Switched mode power supply (SMPS), Active filter , PLL understanding microwave production with basic ideas of Microwave frequencies, Principle of velocity modulation. Reflex klystron. Theory and uses an of cavity magnetron PIN &amp; GUNN Diode, Detection of microwave measurement of power.</p> <p>Understanding Advantages and Disadvantages of Microwave transmission, loss in free space, propagation of microwaves, atmospheric effects on prorogation , Fresnel zone problem, ground reflection, fading sowlles, detectors, components, antennas used in microwave communication system.</p>
<p><b>Advanced Electronics 4</b></p>	<p>Understanding Ananlog computation with Solution of ordinary linear differential equations with constant coefficients, Operation modes of analog computers, repetitive operation of computers, Time scaling,</p>

	<p>amplitude scaling, Generation of functions, Simulation of time varying systems.</p> <p>Understanding Boolean algebra, Canonical forms of Boolean, functions, Simplification of Boolean functions (K-map, Tabulation method), don't care conditions. Digital logic families;</p> <p>Adders &amp; Subtractors, Magnitude comparator, Code converters; Parallel adders, Encoders, Decoders, Multiplexers, Demultiplexers, Parity bit generator and checker, Read only memory (PROM, EPROM), P.L. Digital to Analog and Analog to Digital converters.</p> <p>Understanding Sequential logic- Memory element, RS, JK, JKMS, T type and Edge triggered Flip flop; Registers; Shift register; Counters— synchronous and Synchronous; The memory unit; Semiconductor Random Access Memory; Inter-register transfer; Arithmetic; Logic and Shift Micro-operation; Fixed point and floatation point data.</p>
<p><b>Practical (Sem 4)</b></p>	<p>Study of regulated power supply (723), operational amplifier (741), Timer (555), A to D and D to A converter, Logic gates (Different types), amplitude and frequency modulations and demodulations, different flip-flop circuits (RS, JK, Dk type, T-type, Master slave), Digital combinational and sequential circuits, Microprocessor (8085), SCR etc.</p>
<p><b>Dissertation/ Project</b></p>	<p>The student has to complete a dissertation/project (theoretical and/or experimental) and submit a written report during this last semester. This gives the students some exposure to research and research methodology. Moreover the written report enables the students to write scientific communication. All this is aimed at nurturing them into (possible) future researchers who are capable of- (a) thinking and analyzing critically and clearly (b) adopting the scientific method and (c) working independently.</p>
<p><b>Elective Courses</b></p>	

<p><b>Communication Electronics</b></p>	<p>Understanding AM and FM (Transmission and reception): Modulation, AM generation, Power consideration, Balanced modulator, SSB transmission, AM detection, AGC, Radio receiver characteristics, signal to noise ratio, FM analysis, noise considerations, generation, direct method and reactance tube method, FM transmitter, AFC, FM Propagation, phase discriminator.</p> <p>To know the propagation of radio waves, Antenna and TV.</p> <p>Study of transmission lines, Voltage and current relations on transmission line, propagation constant, characteristic impedance, impedance matching, quarter wave T/L as impedance transformer, attenuation</p> <p>along coaxial cable, cables of low attenuation, propagation of radio waves between two parallel lines, wave guide modes, TE<sub>10</sub> mode and cut off wavelength, cavity resonator, light propagation in cylindrical wave guide, step index and graded index fibers, attenuation and dispersion in fibers.</p>
<p><b>Plasma Physics</b></p>	<p>Introduction to Plasma, Elementary concept: Derivation of moment Equation from Boltzmann Equation, Plasma Oscillation, Debye Shielding, Plasma parameter, Magneto plasma, Plasma confinement.</p> <p>Understanding MagnetoHydrodynamics and magneto Plasma</p> <p>To study plasma propagation and fluid plasma, Propagation at finite angle and CMA diagram, Propagation through ionosphere and magnetosphere, Helicon, Faraday rotation, Fluid equations for a plasma, Continuity equation, Momentum balance equation, Equations of state, Two-fluid equations, Plasma resistivity.</p>

<p><b>Digital Electronics and Computer Architecture</b></p>	<p>Learning elementary idea of combinational and sequential circuits, Overview of Microcomputer organization and operation, Microprocessor evolution and types, Fundamental knowledge of Microprocessor (8085/8086), Architecture and its operation, Basic idea of logic devices for interfacing 8085/8086.</p> <p>Understanding Computer Organization and Architecture</p> <p>Understanding data communication, Computer and Communications, Need for communication networks, Internet and World Wide Web, communication protocols, Local Area Networks, Interconnecting networks, Future of Network Technology.</p> <p>To study Characteristics of communication channels, Allocation of Channels, Physical Communication media, Public Switched Telephone Network, Cellular Communication Path, ATM networks.</p>
<p><b>Atmospheric Physics</b></p>	<p>To gain knowledge about Earth atmosphere, Elementary concept of atmospheric sciences, atmosphere and its composition, Thermal and pressure variation in earth atmosphere, Thermal structure of the troposphere, stratosphere, mesosphere and ionosphere, Hydrostatic equation, spectral distribution of the solar radiation, Green house effect and effective temperature of earth. Meteorological process and different system, local winds, monsoons, fogs, clouds, precipitation, Cyclones and anti-cyclones, thunderstorms, Mountain Meteorology.</p> <p>Understanding Atmospheric Dynamics and Thermodynamics, Environmental pollution and climate change</p> <p>Study of Convective measurements of pressure, temperature, humidity, wind speed and direction, sunshine duration, radiation clouds, upper air pressure, temperature, humidity and wind measurements, Polit balloons, radiosonde, dropsonde, ozonesonde, GPS sonde. Application</p>

	<p>of radars to study the atmospheric phenomenon, LIDAR, SONAR, RASS</p> <p>(Radio- acoustic sounding system), Observational technique for aerosol.</p>
<p><b>Introduction to Nanoscience and Nanotechnology</b></p>	<p>Understanding Emergence of Nanotechnology – Challenges in Nanotechnology, Carbon age–New form</p> <p>of carbon (From Graphene sheet to CNT), Introduction to nanomaterials, evolution of nanoscience, general properties of nanomaterials, role of size in nanomaterials, semiconducting nanoparticles, nanoclusters, quantum wells, conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state. Synthesis of nano structured materials, sol-gel processing, Mechanical alloying and mechanical milling, Inert gas condensation technique, Nanopolymers, Bulk and nano composite materials, top down and bottom up approaches.</p> <p>Study of properties of nanomaterials and characterization techniques.</p> <p>Learning about the applications of nanomaterial to Molecular electronics and nanoelectronics, Quantum electronic devices, Carbon Nano Tube</p> <p>based transistor and Field Emission Display, Biological applications, Biochemical sensor, medical applications and Membrane based water purification. Biological systems- DNA and RNA - Lipids.</p>
<p><b>Self study Courses</b></p>	
<p><b>Advances in High Energy Physics</b></p>	<p>Understanding Gauge Theory and Unification of Fundamentals Forces, Quantum Chromodynamics, Thermal Field Theory and Beyond Standard Model</p>

<p><b>Advances in Laser Physics</b></p>	<p>Understanding Laser Raman Spectroscopy and Laser Spectroscopy in Molecular Beams.</p> <p>To gain knowledge of Modern Laser Spectroscopy.</p>
<p><b>Advances in Solar Physics</b></p>	<p>Learning about Solar Flares: Magnetohydrodynamic Processes, Solar Cycle: Observations and theory, Sun-Earth Connection.</p>
<p><b>Bio-Physics</b></p>	<p>To Know the Basic Concepts of Bio-Physics</p> <p>Understanding Technique For The Study of Biological Structure and Function</p> <p>To study the Radiation Effects on Biological Systems</p>
<p><b>Computer Application in Physics</b></p>	<p>Understanding the role of Computers in Physics, Formulation of a problem for solution on a computer, paradigm for solving physics problems for solution . Algorithms and Flowcharts</p> <p>Learning Scientific Programming (FORTRAN and C language), Scientific Word Processing and Modern Software's For Mathematical Computing (LaTeX and MatLab).</p> <p>Study of Computer Applications to Physical Problems(Numerical Methods and Monte Carlo methods).</p>
<p><b>Medical Physics</b></p>	<p>To know about the mechanics of human body, Physics of Respiratory and Cardiovascular System.</p> <p>Understanding Electricity in the Body and Sound/Light In Medicine and Diagnostic X-Rays and Nuclear Medicine.</p> <p>To gain knowledge about Medical Precision Equipments and Modern Medicines (MRI, PET, CT scan, ventilators, description, working, analysis and clinical applications of Ultrasonic imaging, ECG, EMG, EEG and ERG. Nanotechnology-based drugs e.g. Abraxane, Doxil, C-</p>



	dots (Cornell dots) and goldnano particle as a diagnostic tool, Anti-cancer polymeric nanomedicines, Use of nano-technology in Photodynamic therapy.
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# DEPARTMENT OF POLITICAL SCIENCE

## H.N.B. G.P.G. COLLEGE KHATIMA

### BACHOLER OF ARTS

<b>B.A. I Year</b>	Paper I – Principles of Political Science	The students will get basic knowledge of Political Science and various ideologies of political thinkers.
	Paper-II- Theories of Modern Government	Students will be able to get knowledge of Major Political systems and constitutions of various special countries
<b>B. A. II Year</b>	Paper I – Political thought	The Student will be able to understand various Political thoughts of some kind of world special and famous ancient Political thinkers.
	Paper II- Indian Government and Politics	The student will get basic knowledge of their fundamental rights, duties, and the Indian constitution.
<b>B. A. III Year</b>	Paper I – International Relations	The students can acquire knowledge of various countries' policies and the basic diplomatic rules and relations between each other countries.
	Paper-II Elements of Public Administration	Students will get basic knowledge of the organization and its important role in the budget, requirement, promotion, punishment, motivation, training, and also Lokpal and Lokayukta.

## MA. 1<sup>ST</sup> SEM.

<b>PAPER I</b>	Western Political thought (from Plato to Bodin)	Students will able to get knowledge about the ideology of famous ancient and medieval western political thinkers.
<b>PAPER II</b>	Comparative Politics	By studying this paper students can get knowledge of comparative elements of democracy such as political system, approach, structural functional approach, political culture, socialization, development, modernization, pressure group, electoral system and public opinion etc.
<b>PAPER III</b>	Public Administration	Student will get basic knowledge and difference of public and private administration.
<b>PAPER IV</b>	Indian Political system	Basic knowledge of Indian political system and basics of Indian constitution.
<b>PAPER V</b>	International Politics	The students can acquire the knowledge of various country's policies and the basic diplomatic rules and relations between each other country's.

## MA. 2<sup>ND</sup> SEM.

<b>PAPER I</b>	<b>Political thought (from Hobbes to Marx)</b>	Students will able to get knowledge about the ideology of famous modern political thinkers.
<b>PAPER II</b>	<b>Indian Administration</b>	Student will get basic knowledge and difference of public and private administration with reference to India.
<b>PAPER III</b>	<b>State politics in India with special reference to Uttarakhand</b>	Students can get the knowledge of state politics in the context of Uttarakhand.
<b>PAPER IV</b>	<b>Indian Political Dynamics</b>	Students can get the knowledge of main factors of Indian politics such as caste, communism, secularism, regionalism, gender, corruption etc.
<b>PAPER V</b>	<b>Dissertation</b>	Students can get the knowledge of basics of research.

### M.A. 3<sup>rd</sup> SEM.

<b>PAPER I</b>	<b>Indian Political thought</b>	Students can get the ideology of Indian political thinkers.
<b>PAPER II</b>	<b>Political Ideology</b>	This paper helps the students to understand the knowledge of the world's famous ideologies.
<b>PAPER III</b>	<b>Political thought (from Lenin to Rawls)</b>	The Student will be able to get the knowledge of the ideology of famous communist thinkers.
<b>PAPER IV</b>	<b>Gandhian Discourse in Politics</b>	The Student will get knowledge of the main elements of Gandhian ideologies.
<b>PAPER V</b>	<b>Human Rights / Local self Government/ India in World Affairs</b>	The Students will learn to take an overview on Human Rights, Local self Government and India in World Affairs

### M.A. 4<sup>th</sup> SEM.

<b>PAPER I</b>	<b>Contemporary Political Philosophy</b>	The students will be able to understand contemporary political ideologies.
<b>PAPER-II</b>	<b>Environmentalism</b>	The Student will get the knowledge of environmentalism from political angle.
<b>PAPER III</b>	<b>Post-Cold War International Relations</b>	Students can get the knowledge of the new world order and issues after the post-cold war international relations.
<b>PAPER IV</b>	<b>International Organization</b>	Students can get the knowledge of emerging history and objectives of international military and non-military organization.
<b>PAPER V</b>	<b>Research Methodology/Ethics and Politics</b>	Students can get the basic knowledge of keen factors related with research methods.
<b>PAPER VI</b>	<b>Viva- Voce</b>	To improve the personality development for future prospective.

# DEPARTMENT OF ENGLISH

## PROGRAMME OUTCOME

The main programme outcomes of M. A. in English are:

- Students shall be able to read, interpret, understand and write about a diverse range of texts in English analytically and critically
- Students shall be able to analyze texts of a variety of literary genres in terms of style, figurative language and convention.
- Students shall be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
- Students shall be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students shall be able to ethically gather, understand, evaluate and synthesize information from a variety of written and web sources.
- Students shall be able to understand the growth of literature in India in English translation from classical to modern times.
- 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.
- Students shall be educated in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture.
- 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.
- Students shall become good human beings as the course shall teach them the true

philosophy of life.

## **DEPARTMENT OF CHEMISTRY**

Program specification outcome and Course Outcome are assessed by focusing on the outcome of internal as well as external examination. The marks obtained by the students in the semester/year examination, assignments, practical examination, etc. are reflective/ indicative of Programme/ Course outcomes. This offers information about the achievements of the students to the respective course teachers. Besides this, each department organizes Presentations, Quizzes, Chart/ Poster competitions to motivate the students to exert a little bit of extra effort for improving their performance. The POS is evaluated by the number of students getting selected in various institutions for higher or specialization studies and getting placement after the course.

### **Graduation:**

**Program outcome:** The U.G. program provides the understanding of fundamental chemistry from core to their basic application in daily life. At the end of this program student have acquired the knowledge of chemistry of system, surrounding and their positive and negative impact in our daily life and environment.

**Course outcome:** The students will be able to know

**Inorganic chemistry:** This course includes the fundamental study of atomic structure, periodic properties, Nature of chemical bonding, related theories and chemistry of all the elements of periodic table. Metallurgical processes, chemistry of transition elements, oxidation and reduction, coordination chemistry, hard and soft acid-base theory, metal-ligand bonding in transition metal complexes, magnetic properties of transition metal complexes, electronic spectra of transition metal complexes, thermodynamic and kinetic aspects of coordination compounds, organometallic chemistry, bioinorganic chemistry, inorganic polymers of silicon and phosphorus.

**Organic chemistry:-**this course gives the understanding of structure and bonding, mechanism of organic reactions, stereochemistry of organic compounds and the study of different functional groups in organic molecules. Study of electromagnetic spectrum; absorption spectroscopy, spectroscopy, organo-metallic compounds, organo-sulphur compounds, heterocyclic compounds. Also it involves the study of biomolecular like carbohydrates, amino acids, peptides, proteins and nucleic acids which constitutes of body and monitor the functioning of life. Study of fats, oils and detergents, synthetic polymers, synthetic dyes, natural products.

**Physical Chemistry:-**This course links physical state with the chemical changes occurs in our surroundings and nature. The chemistry of different states i.e. Solid, liquid and gaseous state and colloidal state and branch of science that deals with the quantitative relationship between heat and other forms of energy called thermodynamics and the chemistry related to electrolytes called electrochemistry. Study of Elementary Quantum Mechanics, Spectroscopy, Photochemistry, Physical Properties and Molecular Structure, Solutions and Colligative Properties, Thermodynamics.

## **POST-GRADUATION**

**Program outcome:** The P.G program offer the understanding of detail, advanced and fine

knowledge of chemistry. This program explores and covers the remaining concept of U.G program and links the text book chemistry to the daily life activities and their application. Importantly this program includes the course that deals with the study of interaction of light with matter called spectroscopy which helps in the real analysis.

## **COURSE OUTCOME:**

### **INORGANIC CHEMISTRY**

This Course encompasses the theories and bonding concepts in coordination compound and acids-bases in detail. The interesting chemistry of organometallic compounds.

The students will be able to know

1. The chemistry of main group elements, synthesis and properties of few main group compounds.
2. General properties and separation of lanthanides and actinides.
3. Basics of nuclear chemistry and radio analytical techniques.
4. Stability of organometallic compounds and clusters, and their applications as industrial catalysts.
5. Explain the formation, reaction mechanism and stability of coordination complexes.
6. Interpret the electronic and magnetic properties of inorganic compounds.

### **ORGANIC CHEMISTRY**

This advance organic chemistry course includes the mechanism, energy consideration, stereochemistry and different types of organic reactions in detail.

The students will be able to explain

1. Mechanistic aspects in nucleophilic and electrophilic substitution.
2. Reaction conditions, products formation and mechanisms of some named reactions.
3. Mechanisms of addition reactions of C=C and C=O bonds and elimination reactions.
4. Assess chromatographic separation and identification of organic compounds.
5. Distinguish purification, crystallization, and different distillation processes.
6. Recognize synthesis, purification and characterization of aspirin, Schiff's base, Diels-



Alder adduct.

## **PHYSICAL CHEMISTRY**

This course includes the thermodynamic and kinetic behaviour of reaction and various theories for reaction kinetics. The students will be able to:

1. Comprehend the redox processes in electrochemical systems.
2. Explain Debye-Huckel theory and determination of activity and activity coefficient.
3. Correlate and differentiate Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics, theories of specific heat for solids.
4. Interpret mechanism for chemical reactions for optimizing the experimental conditions.
5. Familiar with application of homogeneous and heterogeneous catalysis in chemical synthesis.
6. Explain the importance of adsorption process and catalytic activity at the solid surfaces.
7. Classify the colloidal material and their stability for many practical uses.

**GROUP THEORY AND INSTRUMENTATION CHEMISTRY:** Group Theory is the mathematical application to determine the symmetry of molecule and molecular operation and to obtain knowledge of its physical properties and binding nature. Instrumentation techniques involve the understanding about the instruments and techniques used in analysis.

The students will be able to explain

1. The concepts of symmetry and group theory in solving chemical structural problems.
2. Molecular structure by the use of character tables and projection operator techniques.
3. The importance of symmetry and group theory in spectroscopic applications.

**Spectroscopic Techniques:** This course deals with the study of interaction of light with matter. The light of different energy cause different type of changes like electronic, vibration, rotational, nuclear etc. interaction with different frequency light in molecule. Organic spectroscopy includes NMR, ESR, Mossbauer, IR, UV-visible spectroscopy.

The students will be able to

1. Identify functional groups using IR,  $\lambda_{\max}$  for polyenes and  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds.

2. Interpret Cotton effect curves for obtaining absolute configuration of chiral molecules with chromophores.
  3. Determine chemical structure by UV-Vis, IR, <sup>1</sup>HNMR, <sup>13</sup>CNMR and mass spectral data.
  4. Interpret microwave, vibration-rotation Raman and infra-red spectra for chemical analysis
  5. Analyze electronic spectra of different elements and simple molecules.
4. Comprehend Nuclear Magnetic and Electron Spin Resonance spectroscopic techniques for organic compounds analysis and medical diagnostics.

**Solid State Chemistry:** The students will be able to

1. Correlate the physicochemical properties, defects in solid, diffraction techniques, electrical and magnetic properties of materials.

**Chemistry for Biological System:** The students will be able to

1. Assess molecular structure and interactions present in proteins, nucleic acids, carbohydrates and lipids.
  2. Be familiar with organization and working principles of various components present in living cell.
  3. Evaluate kinetics, thermodynamics, and mechanism of protein folding.
1. Assess the structure and biological functions of proteins and the role of metals in biology.

**Inter Disciplinary Topics in Chemistry:** The students will be able to

1. Comprehend experimental techniques for different catalytic reactions.
2. Interpret physical and chemical characterization of catalysts and catalytic reaction.
3. Be familiar with various reagents and their applications in industry.
4. Various optical methods like AES, AAS, plasma and electric discharge spectroscopy, spectrofluorimetry, nephelometry and turbidimetry.
5. Potentiometric, coulometric, and voltametric methods of analysis.
6. Chromatographic techniques and applications.

**Photo Chemistry and Allied Chemistry:** Various reactions takes place by the effect of

temperature change called thermal reaction. The reactions which takes place by the effect of light of different frequency and wavelength is called photochemical reaction and mechanism of such reactions studied under photochemistry.

The student will be able to

1. Conformational analysis of cycloalkanes, reactivity, chirality, interconversion, resolution and asymmetric synthesis.
2. Aromaticity, nonaromaticity and antiaromaticity in carbocyclic and heterocyclic compounds.
3. Molecular orbital symmetry and possibility of thermally and photochemically pericyclic reactions.
4. Basics of photochemical reactions of alkenes, carbonyl and aromatic compounds.
5. Assess photochemistry and photophysical principles.
6. Identify and characterize of transient intermediates by ultrafast modern techniques.
7. know the theory and application of photochemistry and photophysical principles of macromolecules.

**organic Synthesis:** The synthesis of organic molecules involve various approached and mechanism, new molecules synthesized by mimicking the existing route amd concept. Retrosynthetic or disconnection approach also used to design various drug molecule and biologically active molecule.

The students will be able to interpret

1. Mechanistic pathway of organic reactions.
2. Retro-synthetic approach to planning organic syntheses.
3. Conversion of different functional group *via* rearrangement reaction.

**Medicinal Chemistry:** The students will be able to

1. Comprehend drug designing and development, their SAR and QSAR.
2. Explain the mode of action of different drugs.
3. Describe the role of drugs to inhibit the particular enzymes and treatment of disease.

**Program Specific Outcomes:**

Chemistry is a broad area, its important branch of science as everything we do is chemistry! All matter is made up of chemical, even our body is made of chemicals and chemical reaction occur when we eat, breath etc, so it's the study of everything. From starting (like extraction of elements, compounds) to their final state (like polymers, cosmetics, drugs and medicine etc.) Ready for application involve various chemical processes and purification techniques which were studied under the program. The advantage of leaning chemistry and acquiring knowledge about the process and techniques involves have great career opportunities in academic as well as industries. As this subject covers broad area, one can pursue a job as a pharmacologist, biochemist, lab technicians, analytical chemist, environmentalist, synthetic chemist, material scientist, geochemist, chemical engineer in industry.

# DEPARTMENT OF PHYSICS

## HNB PG COLLEGE KHATIMA

**PROGRAM OUTCOMES (POS):** The Physics department offers two programs:

1. Physics for B.Sc. students of PCM.
2. M.Sc. Physics.

Both these programs are primarily geared towards cultivating the idea – “*Physics is the study of nature and its laws (till the most fundamental level)*”, amongst the students. The Program Specific Outcomes (PSOs) and the Course Outcomes (COs) of the individual programs/courses/papers are more or less spun around this theme and are listed below.

**Program Specific Outcomes (PSOs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM)

**PSO1:** Understanding the fundamental concepts of Physics and its basic laws.

**PSO2:** Acquire the necessary mathematical tools and concepts required for understanding the underlying physics.

**PSO3:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical).

**PSO4:** Acquire problem solving skills and ability to apply them to real world physical phenomenon.

**PSO5:** Motivation to pursue higher studies (Postgraduate, Research etc.) in Physics.

**Course Outcomes (COs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM).

<b>Mechanics and Theory of Waves and Oscillations</b>	Understanding vector analysis (applying concepts for problem solving), the nabla operator (Gradient, Divergence & Curl), Differentiation and Integration of Vectors (fields), Integral Theorems (Gauss, Stokes, Green and corollaries). Understanding - Frame(s) of Reference, Newton's Laws (along with application for point particles as well as system of particle), (conservative) force and potential energy, Work-Energy Theorem, Rocket motion.
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Understanding quantities and ideas related to rotational motion- Angular Velocity, Angular momentum, Torque, Moment of Inertia (calculations and related theorems), Conservation of Angular Momentum.

Understanding Newton's law of gravitation, Gravitational Field, Potential & Potential Energy, Central force, Kepler's Laws of Planetary motion, Satellite and Planetary orbits and motions.

Understanding material properties such as elasticity, stress, strain, various elastic constants and their relationships, Experimental methods to determine the various elastic properties.

Understanding fluids at rest (surface tension, excess pressure) as well as in motion (viscosity, flow through capillary tube, Bernoulli's theorem, Poiseuille's formula), Experimental methods to determine surface tension and viscosity.

Understanding Simple Harmonic Motion, the Harmonic Oscillator Equation and solutions, Linearity and Superposition principle, Superposition of Harmonic Oscillations- Collinear(Interference & Beats) and Perpendicular (Lissajous Figures).

Understanding waves and wave motion, Waves on a string (travelling and standing), Normal-modes, Group and Phase velocities. Understanding the Fourier Theorem and its applications.

Understanding Damped Harmonic Oscillations, Over/Under/Critical damping, Relaxation time, LCR circuit.

Understanding Forced Harmonic Oscillations, Transient and Steady state behavior, Resonance and Sharpness, Bandwidth, Quality Factor.

Understanding intensity and loudness of sound waves, Decibels, Ultrasonic waves (generation, detection and uses), Building acoustics, Reverberation time and Sabine's formula, (Acoustic) design of buildings.

<p><b>Electricity and Magnetism</b></p>	<p>Understand the basic concepts of Electrostatics-Field, Flux, Gauss's Theorem with applications, Potential and relation with Field, Potential Energy. Also concept of conductors, dielectrics and capacitance, The Electric-Vector.</p> <p>Understand the basic concepts of Magnetostatics- Biot-Savart's Law and applicatons, The Lorentz Force law, Div and Curl of magnetic field and the magnetic vector potential, Ampere's circuital law, Magnetism in matter (Magnetization, Permeability, Susceptibility) and Types of Magnetic materials (Dia, Para &amp; Ferro). Understanding inductance (self and mutual and induction), Faraday's Law, Lenz' Law &amp; energy conservation, AC circuits- RC, LC and LCR, Resonance.</p> <p>Realizing that EM is contained in the 4 Maxwell's Equations, Understanding equation of continuity, displacement current, Maxwell's correction to Ampere's circuital law. Gain knowledge on EM waves, propagation and their properties using Maxwell's equations, Polarization of EM Waves.</p>
<p><b>Practical (B.Sc. !st Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 1 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Momentof Inertia, Elastic constants, Simple &amp; Compound pendulums, Current, Voltage, Resistances, Solenoid, LCR circuit, SHM, Normal modes of a string etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>
<p><b>Heat Thermo dynamics &amp; Statistical Physics</b></p>	<p>Understanding the basic thermodynamic concepts- State variable, Equilibrium, Heat, Work, Zeroth and First Laws and the concepts of Temperature and Internal Energy, Applications of First Law to various processes (Adiabatic, Isothermal etc.), Mayer's relation.</p> <p>Understanding the need of second law of thermodynamics, Reversible &amp; Irreversible processes, Heat Engine and Refrigerator, Second Law of Thermodynamics (in term of Engines and refrigerators), concept of entropy, the Carnot cycle, second law in terms of entropy change, the Nernst theorem.</p>

Understanding the four thermodynamic potentials, The Maxwell's relations and applications (response functions, Joule-Thompson cooling, Calusius-Clapeyron equation etc.)

Understanding the Kinetic Theory of Gases (towards a microscopic description), Maxwell's velocity distribution law, transport phenomenon, the classical equipartition theorem and its use to determine specific heats of mono-atomic and diatomic gases.

Understanding Blackbody radiation (the first step towards quantum mechanics), Spectral emissive power, Energy Density of Cavity Radiation, The Rayleigh-Jeans Law, Planck's law and deducing Wien's displacement law, Wien's distribution laws (1<sup>st</sup> and 2<sup>nd</sup>), Stefan-Boltzmann law and Rayleigh-Jeans from it.

Understanding Basic postulates of Statistical Physics, Macro and Micro States, Phase Space, Density distribution in phase space,  $\mu$  space representation and its division, Statistical average values, Condition of equilibrium, Stirling's Approximation, Entropy and Thermodynamic probability, Boltzmann entropy relation. Ensembles, Micro -canonical, Canonical and Grand Canonical ensembles, Statistical definition of temperature and interpretation of second law of thermodynamic, Pressure, Entropy and Chemical potential. Entropy of mixing and Gibb's paradox, Partition function and Physical significances of various statistical quantities.

Understanding Maxwell-Boltzmann statistics and Distribution law, Energy distribution function, MaxwellBoltzmann law of velocity distribution (most probable velocity, average velocity, RMS velocity), Limitations of M-B statistics, Elementary idea of quantum statistics.



<p style="text-align: center;"><b>optics</b></p>	<p>Understanding Geometrical Optics- Fermat's principle of extremum path and applications, Cardinal points, Combination of Lenses, Lagrange equation of magnification.</p> <p>Understanding optical instruments- Eye pieces (Ramsden's, Huygen's and Gaussian), Aberrations (and types) and their corrections.</p> <p>Understanding the Interference of Light- The superposition principle, Coherence and conditions for interference, Double slit interference, Division of amplitude and division of wavefront, Fresnel's Biprism, Phase change upon reflection, Thin-film interference (Haidenger and Fizeau fringes), Newton's rings (theory and experimental setup), The Michelson Interferometer and its (experimental) use, Fabry-Perot interferometer.</p> <p>Understanding diffraction of light- Fresnel diffraction, Half-period zones and zone-plate, Diffraction pattern of edge, slit and wire, Fraunhofer diffraction (single, double and multiple slits), The diffraction grating as a measurement tool.</p> <p>Understanding polarization of light- Transverse EM Wave, Plane polarized light (production and analysis), Malus Law, Brewster's Law, The Nicol Prism, Circularly and Elliptically polarized light, Optical rotation, The polarimeter (experimental setup also).</p>
<p style="text-align: center;"><b>Practical (B.Sc. 2<sup>nd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 2 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about thermal conductivity, blackbody radiation, calorimetry, statistical probabilities, dispersion, interference, gratings, lens combinations, polarization etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

**Modern  
Physics**

Understanding the origins of quantum theory- Blackbody radiation and early radiation laws, Planck's (revolutionary) idea (the quantum hypothesis & birth of quantum mechanics), Photoelectric and Compton effects. waves and their wavelength, Davisson-Germer Experiment, Wave-particle duality, The uncertainty principle (position-momentum and Energy-time), Interference experiments with particles.

Understanding the Schrodinger's equation (quantum mechanical equation of motion), Time dependent and time-independent versions, Framework of QM (postulates, wavefunction- properties and physical significance), Probability and Conservation, Operators, Eigenfunctions and Eigenvalues, Expectation values, The free particle wavefunction.

Learning to solve the Schrodinger's equation, Stationary states, Boundary conditions lead to quantization, Potential Step & Barrier and transmission, Potential well (infinite and finite depths), The one dimensional harmonic oscillator in QM, Zero point energy.

Learning to solve the Schrodinger's equation in three dimensions (for spherically symmetric systems), The Schrodinger's equation for the Hydrogen atom and solving it using separation of variables, Angular momentum eigenfunctions (spherical harmonics), Solving the radial equation using Frobenius's method, Emergence of the various quantum numbers (n, l and m).

Understanding the various atomic models- Thomson, Rutherford and Bohr, the Bohr model and the hydrogen spectra, Other quantum ideas/experiments- Bohr-Sommerfeld model and quantization condition, the Stern-Gerlach experiment and electron spin, Electron magnetic moment, Bohr magneton, Larmor's precession, The vector atom model, Space quantization.

Understanding optical spectra (on the basis of the vector atom model), LS and JJ couplings, Selection and Intensity Rules, The fine structure of sodium D lines, Magnetic interactions and Zeeman effect, X-ray spectra and

	<p>Moseley's Law.</p> <p>Understanding basics of radiation, Absorption and Emission (spontaneous and stimulated), The Einstein's A and B coefficients, Metastable states (long living), Population inversion, Pumping, Lasing action and Laser/Maser.</p> <p>Understanding Franck-Condon Principle, Molecular spectra, Rotational, Vibration and Electronic spectra of diatomic molecules, General features of electronic spectra, Luminescence, Basics of Raman effect.</p> <p>Understanding the atomic nucleus, Constituents of the nucleus, properties, Nature of nuclear force, Binding Energy and BE curve, Stable nuclei, The semi-empirical mass formula, Models of the nucleus (Liquid drop and Shell model), elementary particles and their classification schemes.</p>
<p><b>Electronics</b></p>	<p>Understanding Kirchhoff's Laws, Superposition Theorem, Constant voltage source and constant current source, Conversion of voltage source into current source, Thevenin's Theorem and procedure for finding thevenin equivalent circuit, Norton's Theorem and procedure for finding Norton equivalent circuit, Maximum power transfer theorem, Applications of Network Theorems, Four terminal Network and h-parameters.</p> <p>Understanding elementary semiconductors and devices (intrinsic, extrinsic-P &amp; N), the PN diode and its characteristics in forward and reverse bias, Zener diode, Optoelectric devices- LEDs, Photodiode and Solar cell.</p> <p>Understanding diode circuits- The rectifier- Half-wave, Full-wave (Centre tapped and Bridge versions), Ripple factor and Efficiency, Filters (C, L, Pi etc.), Clipping and Clamping circuits using diodes, Voltage multipliers, Zener diode and voltage regulation.</p> <p>Understanding transistors and amplifiers- Bipolar Junction transistors (NPN, PNP), Characteristics (input and output) in various configurations (CE, CB &amp; CC), Current gains alpha and beta and their relation, Load line analysis, Q-point, Active, Cutoff and Saturation regions, Transistor biasings; Transistor Amplifiers- Voltage, Current and Power, Class A, B and C amplifiers; The Field Effect Transistor (FET) and the Uni-Junction</p>

	<p>Transistor (UJT)</p> <p>Understanding Oscillator circuits- Feedback (negative and positive), Birkhausen's criterion, RC (Wein bridge and Phase-Shift) &amp; LC (Collector tuned and Colpitt) oscillators and frequency of oscillation, Crystal oscillators, The Multivibrator and various operation modes (Monostable, Astable and Bistable).</p> <p>Understanding Digital Electronics and Circuits- Number systems (Binary etc.) and conversions, Basic Logic Gates (AND, OR &amp; NOT) and realizations using diodes and transistors, Universal Gates (NAND &amp; NOR), Other gates, Boolean Algebra- De Morgan's Theorem, Simplifying logic circuits, Minterm, Maxterm, SOP and POS, Karnaugh Map, Binary arithmetic (addition, subtraction) using</p> <p>circuits- Half/Full adders, Word (4-bit) binary adder-subtractor</p>
<p><b>Practical</b> <b>(B.Sc. 3<sup>rd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 3 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Energy quanta, quantization, diodes, LEDs, rectifiers, power supplies, transistors, amplifiers, oscillators, logic gates, Boolean algebra, logic circuits etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

### **PROGRAM SPECIFIC OUTCOMES (PSOs): FOR M.SC. PHYSICS**

**PSO 01:** Strengthening and further understanding of the fundamental concepts of Physics and its basic laws (as acquired during the Under-graduate studies) by augmenting mathematical rigor (at the Physicists level) along with Physical interpretations (and clear physical picture(s)) of any theory/process/situation.

**PSO 02:** Acquire the necessary mathematical-tools (analytic, approximate, numerical, graphical etc.) and concepts required for understanding the underlying physics and use them to solve complex and advanced problems (including those with real world

applications).

**PSO 03:** Gain substantial knowledge in the various (core) branches of Physics- viz. Classical Mechanics, Electrodynamics, Mathematical Methods, Quantum Mechanics, Statistical Mechanics, Condensed Matter Physics, Astrophysics, Electronics, Nuclear Physics, Particle Physics etc.

**PSO 04:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical). Also gradually develop the scientific method by designing and conducting experiments.

**PSO 05:** To get an exposure to research and research methodology during the dissertation work (theoretical and/or experimental) to be performed during the last semester.

**PSO 06:** Motivation to pursue a research/academic career in Physics. Aim towards writing and qualifying in various competitive exams- (e.g. CSIR-UGC-NET, GATE, JEST, BARC, DRDO, Entrance exams of premier research institutes (National & International)).

**PSO 07:** Gain knowledge of the subject along with general competence and analytical skill for employment in other sectors viz. industry, R&D, consultancy, public administration etc.

### **COURSE OUTCOMES (COS): FOR M.SC. PHYSICS**

<b>Mathematical Physics</b>	To learn series solution of differential equations, Legendre, Bessel, Hermite, and Laguerre differential equation and related polynomial, physical integral form of polynomials and their orthogonality relations. Generating Function and recurrence relation.  Understanding curvilinear Coordinates and various operators in circular, cylindrical and spherical coordinate systems, classification of Tensors, Rank of a Tensor, covariant and contra-variant tensors, symmetric and anti-symmetric Tensors, Kronecker delta symbol. Contraction of
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	<p>Tensor, metric Tensor and Tensor densities, covariant differentiation and Geodesic equation.</p> <p>Understanding function of complex variable, Cauchy's Riemann differential equation, Cauchy's integral theorem, residues and Cauchy's residues theorem, singularities, evolution of residues and definite integral.</p> <p>Understanding Fourier integral and Fourier Transform, Fourier integral theorem, finite and infinite integral, Laplace transform of elementary function (Dirac delta &amp; Green's function), Solution of simple differential equations.</p>
<p><b>Classical Mechanics</b></p>	<p>Understanding mechanics of a system of particles (Constraints and generalized coordinates, D'Alembert's principle, Lagrange equations for holonomic and non holonomic systems and their applications, conservation laws of linear momentum, energy and angular momentum.</p> <p>Understanding Lagrangian and Hamiltonian Formulations with their applications to various conservative systems, Hamilton Jacobi theory.</p> <p>Understanding Dynamics of rigid bodies including Motion of a rigid body, body and space Reference system, angular momentum and Inertia tensor, Principle axes- Principle moments of Inertia, spinning tops, Euler angles, Infinitesimal rotations.</p> <p>Understanding Central force problem including Action and angle variables, phase integral, small oscillations, Kepler's laws of Planetary motion and their deduction, scattering in a Central field, Rutherford scattering cross section.</p>
<p><b>Quantum mechanics</b></p>	<p>Understanding that our world is inherently quantum and so the proper framework to understand it is Quantum Mechanics.</p> <p>"Establishing"/Understanding the basic framework of QM</p>

	<p>(Schrodinger's equation, wavefunction and probabilistic interpretation, uncertainty relations etc.).</p> <p>Learning to solve the Schrodinger's (time-independent) equation (various one and three dimensional problems).</p> <p>Understanding the various formulations of QM and their equivalence- Schrodinger, Heisenberg (Matrix) and Dirac formulations.</p> <p>Understanding symmetry in QM- Space and Time translation symmetries as well as Rotational symmetry (Angular momentum, Spin, Addition etc.)</p> <p>Understanding the various approximation methods to solve the Schrodinger's equation (Perturbation, Variational method, WKB approximation) and application to different (stationary) state problems.</p> <p>Applying approximation methods to time dependent problems and treatment of radiation (emission and absorption) via such methods (Time dependent perturbation theory, Fermi's Golden Rule, the Semiclassical theory of radiation etc.).</p>
<p><b>Statistical Mechanics</b></p>	<p>Understanding the (average) microscopic description vs. the macroscopic description (as done in Thermodynamics) for a system with large no. of degrees of freedom.</p> <p>Understanding (and calculating within the framework) the various statistical ensembles and the corresponding (thermodynamic) formulations.</p> <p>Application of the statistical ideas to derive/understand the behavior of gases (ideal as well as real).</p> <p>Understanding the basics of Quantum SM (FD &amp; BE stat) and some simple applications.</p> <p>Understanding blackbody radiation as a gas of photons (i.e statistical treatment- BE statistics).</p>
<p><b>Atomic &amp; Molecular Physics</b></p>	<p>Understanding that optical properties of materials and realizing the fact that it are just an application of Quantum Mechanics to</p>

	<p>atomic/molecular systems.</p> <p>Understanding the atomic and molecular spectra along with their finer features (Fine structure, Vibrational-Rotational spectra).</p> <p>Understanding the effect of electric and magnetic fields on the various spectra via interactions (or charge and/or spin).</p> <p>Understanding the various theories/formulations/models to understand spectra (Vector atom model, LS, JJ coupling schemes, Raman spectroscopy, Heitler-London and Born-Oppenheimer treatments etc.)</p> <p>Understanding the quantum theory of radiation (Einstein's coefficients) and basic working principle of Lasers.</p>
<p><b>Practical (Sem1)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 1<sup>st</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. CRO, SCR, Transistors, Diodes, FET, Amplifiers, Oscillators, Antennas, Amplitude modulation/demodulation etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>General relativity and cosmology</b></p>	<p>Understanding the foundations of general relativity including Elements of Special relativity, Tensors as geometrical objects, Mach's Principle, non-inertial frames of reference, Gravity and space-time, Principle of equivalence and principle of general covariance, Metric tensor and gravity, Geodesics and Affine parameters (Christoffel symbols), covariant derivative and its geometrical interpretation, parallel transport, spacetime curvature and curvature tensor, Riemann curvature tensor, Bianchi identity, Ricci tensor, classification of space-time curvature (in different dimensions).</p>



	<p>Understanding Christoffels connection as Einstein's connection, Gravitational action, field equations and their general properties, Newtonian limit of Einstein's field equations, Metric in spherically symmetric space-time (Schwarzschild metric), Orbits in the Schwarzschild metric, gravitational collapse of a dust sphere, Schwarzschild black holes.</p> <p>Introduction of Gravitational radiation, Wave equation in linearized theory and plane waves, propagating modes of gravity, gravitational waves in a flat space-time background, propagation of gravitational waves in the curved space-time, Energy and momentum of the gravitational waves, Detection of gravitational waves.</p> <p>Basic Concepts and elementary idea of big-bang and steady state cosmologies, Seagull static models, Cosmological principle, Friedmann space-time, Robertson-Walker line element, Weyl's postulate, expansion of the universe, Hubble's law, dynamical equation of cosmology</p> <p>and their consequences, the primordial fire and the remnant radiation, Big-bang and steady state models of the universe.</p>
<p><b>Advanced Quantum Mechanics</b></p>	<p>Understanding, applying and formulating QM at an even deeper level than done earlier (in the QM Course).</p> <p>Applying quantum ideas to understand the scattering of particles. Employing various (approximate) methods- Partial Wave Analysis and the Born approximation.</p> <p>Understanding notion of identical and indistinguishable. Realizing origin of the Pauli's exclusion principle and related notions (Spin-Statistics connection, Permutation symmetry etc.) Formulation (along with the need) of the relativistic version of (NR) quantum mechanics. Working out in detail the two basic relativistic wave equations (Klein-Gordon and Dirac equations) and the various associated</p>

	<p>phenomenon/notions (Plane wave solutions, Negative Energies and Probabilities, Spin of electron and its magnetic moment, The Hole Concept, Particles and Antiparticles etc.)</p> <p>Understanding the need of relativistic quantum fields (towards Quantum Field Theory), Field formulations for the various wave equations via 2nd quantization.</p>
<p><b>Nuclear Physics</b></p>	<p>Understanding the atomic nucleus and its various properties along with the experimental tools and techniques of nuclear investigations.</p> <p>Understanding basic properties of the nucleus and the various nuclear models.</p> <p>Understanding the nature of the nuclear force along with experimental setup(s) to study them. Understanding radioactive decay and its various feature.</p> <p>Understanding nuclear reactions by applying (mainly) quantum ideas to them.</p>
<p><b>Elementary Particle Physics</b></p>	<p>Get a basic understanding of the fundamental constituents of our Universe (the “elementary” particles and the four fundamental interactions).</p> <p>Understanding the gauge principle and role of symmetry (along with ideas of unification). Understanding the common (mathematical) origin of (the various) conservation laws as a manifestation of (some) symmetry.</p> <p>A very basic understanding of the unification of the fundamental interactions- Electroweak and Grand Unifications.</p> <p>Understanding (hadronic) matter as composed of quarks and the “construction” schemes (i.e. various direct-product representation of SU(3)). An overview of the various properties of quarks (and also of the composite mesons and baryons).</p>

<p><b>Condensed Matter Physics</b></p>	<p>Understanding of the basic (theoretical) ideas involved in the study of Condensed Matter Physics.</p> <p>Understanding the origin of elasticity (and elastic constants) from the properties of the underlying crystal structure.</p> <p>Understanding the interaction of crystals with radiation (X-rays) and the related theoretical framework as well as experimental setup(s) (Diffraction experiments).</p> <p>Understanding the quantum treatment of elastic/sound waves (i.e. the idea of phonons and phonon gas etc.)</p> <p>Understanding the thermal properties of solids on the basis of the phonon picture.</p> <p>Understanding crystal defects, superconductivity, and magnetism.</p>
<p><b>Practical (Sem2)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 2<sup>nd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. oscillators, electronically regulated power supply, negative feedback amplifiers, FET characteristics, Michelson Interferometer, Fabry Parot Interferometer, four probe method, Fresnel's Law, Magnetic susceptibility, Radiation laws, etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics I</b></p>	<p>Understanding Integrated Circuit technology, Classification of IC's, Fabrication of IC's &amp; components, Basic monolithic integrated circuit technology, processes used in monolithic technology, active &amp; passive components, metal semiconductor contact, thick &amp; thin film IC's, hybrid IC's, charge coupled devices (CCD), advantages &amp; limitations of integrated circuits.</p>

	<p>Understanding Operational amplifiers (Linear and Non-linear Analog systems),</p>
<p><b>Advanced Electronics II</b></p>	<p>Understanding Digital communication, Digital signal processing, Image processing (Basic ideas only), Pulse Modulation systems, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse position modulation, Pulse code modulation, Delta modulation Frequency division multiplexing (FDM), Basic idea of digital telemetry.</p> <p>Learning Optical communication, Principle of optical communication, Different modes of propagation of E. M. Wave through optical fibre, Brief concept, classification of fibres and ray path, Advantages of multimode fibres and cladding , Optical Fibre connectors, Optical Fibre communication Receiver, Brief Introduction , Signal path through optical data link, Block diagram of optical Receiver, Advantages of optical communication, Light propagation in cylindrical wave guide.</p> <p>Gaining knowledge of Memory and optoelectronic devices, Bulk and thin films. Photoconductive devices (LDR), Memory devices, static and dynamic random access memories SRAM and DRAM, CMOS and NMOS, nonvolatile-NMOS, magnetic, optical and ferromagnetic memories, charge coupled devices (CCD), LCDS.</p>
<p><b>Electrodynamics</b></p>	<p>Realizing the unification of Electricity and Magnetism as a single physical concept- Electromagnetism (or Electrodynamics) and that Maxwell's equations express this fact. Understanding various electromagnetic phenomenon (EM Wave in vacuum, conductors, non-conductors, plasma, bounded media, wave guides).</p> <p>Understanding the potential formulation of ED (and its advantages).</p> <p>Understanding generation and nature of radiation (fields) from moving (accelerated) charges. Formulating ED (and writing and performing calculations) within the relativistic framework i.e. four-vector &amp; Tensor notations. Understanding the role of this relativistic formulation</p>

	and ability to apply it elsewhere.
<b>Practical (Sem 3)</b>	The various practicals included in the Physics syllabus of M.Sc. 3 <sup>rd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of this semester (Richardson's Law, ESR spectra, Hall effect, multivibrators, transistor amplifiers cum feedback amplifiers, FET and MOSFET, VTVM etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.
<b>Advanced Electronics 3</b>	<p>Understanding power supply regulation including Servomechanism, regulation using OA, Zener reference source, The 723 regulator current regulator, short circuit and over load protection, Precision rectifier, IC regulated power supply. Three terminal voltage regulations, dual Polarity regulated power supplies using 78 XX and 79 XX series regulators, Switched mode power supply (SMPS), Active filter , PLL understanding microwave production with basic ideas of Microwave frequencies, Principle of velocity modulation. Reflex klystron. Theory and uses an of cavity magnetron PIN &amp; GUNN Diode, Detection of microwave measurement of power.</p> <p>Understanding Advantages and Disadvantages of Microwave transmission, loss in free space, propagation of microwaves, atmospheric effects on propagation , Fresnel zone problem, ground reflection, fading sowlles, detectors, components, antennas used in microwave communication system.</p>
<b>Advanced Electronics 4</b>	Understanding Analog computation with Solution of ordinary linear differential equations with constant coefficients, Operation modes of analog computers, repetitive operation of computers, Time scaling,

	<p>amplitude scaling, Generation of functions, Simulation of time varying systems.</p> <p>Understanding Boolean algebra, Canonical forms of Boolean, functions, Simplification of Boolean functions (K-map, Tabulation method), don't care conditions. Digital logic families;</p> <p>Adders &amp; Subtractors, Magnitude comparator, Code converters; Parallel adders, Encoders, Decoders, Multiplexers, Demultiplexers, Parity bit generator and checker, Read only memory (PROM, EPROM), P.L. Digital to Analog and Analog to Digital converters.</p> <p>Understanding Sequential logic- Memory element, RS, JK, JKMS, T type and Edge triggered Flip flop; Registers; Shift register; Counters— synchronous and Synchronous; The memory unit; Semiconductor Random Access Memory; Inter-register transfer; Arithmetic; Logic and Shift Micro-operation; Fixed point and floatation point data.</p>
<p><b>Practical (Sem 4)</b></p>	<p>Study of regulated power supply (723), operational amplifier (741), Timer (555), A to D and D to A converter, Logic gates (Different types), amplitude and frequency modulations and demodulations, different flip-flop circuits (RS, JK, Dk type, T-type, Master slave), Digital combinational and sequential circuits, Microprocessor (8085), SCR etc.</p>
<p><b>Dissertation/ Project</b></p>	<p>The student has to complete a dissertation/project (theoretical and/or experimental) and submit a written report during this last semester. This gives the students some exposure to research and research methodology. Moreover the written report enables the students to write scientific communication. All this is aimed at nurturing them into (possible) future researchers who are capable of- (a) thinking and analyzing critically and clearly (b) adopting the scientific method and (c) working independently.</p>
<p><b>Elective Courses</b></p>	

<p><b>Communication Electronics</b></p>	<p>Understanding AM and FM (Transmission and reception): Modulation, AM generation, Power consideration, Balanced modulator, SSB transmission, AM detection, AGC, Radio receiver characteristics, signal to noise ratio, FM analysis, noise considerations, generation, direct method and reactance tube method, FM transmitter, AFC, FM Propagation, phase discriminator.</p> <p>To know the propagation of radio waves, Antenna and TV.</p> <p>Study of transmission lines, Voltage and current relations on transmission line, propagation constant, characteristic impedance, impedance matching, quarter wave T/L as impedance transformer, attenuation</p> <p>along coaxial cable, cables of low attenuation, propagation of radio waves between two parallel lines, wave guide modes, TE10 mode and cut off wavelength, cavity resonator, light propagation in cylindrical wave guide, step index and graded index fibers, attenuation and dispersion in fibers.</p>
<p><b>Plasma Physics</b></p>	<p>Introduction to Plasma, Elementary concept: Derivation of moment Equation from Boltzmann Equation, Plasma Oscillation, Debye Shielding, Plasma parameter, Magneto plasma, Plasma confinement.</p> <p>Understanding MagnetoHydrodynamics and magneto Plasma</p> <p>To study plasma propagation and fluid plasma, Propagation at finite angle and CMA diagram, Propagation through ionosphere and magnetosphere, Helicon, Faraday rotation, Fluid equations for a plasma, Continuity equation, Momentum balance equation, Equations of state, Two-fluid equations, Plasma resistivity.</p>

<p><b>Digital Electronics and Computer Architecture</b></p>	<p>Learning elementary idea of combinational and sequential circuits, Overview of Microcomputer organization and operation, Microprocessor evolution and types, Fundamental knowledge of Microprocessor (8085/8086), Architecture and its operation, Basic idea of logic devices for interfacing 8085/8086.</p> <p>Understanding Computer Organization and Architecture</p> <p>Understanding data communication, Computer and Communications, Need for communication networks, Internet and World Wide Web, communication protocols, Local Area Networks, Interconnecting networks, Future of Network Technology.</p> <p>To study Characteristics of communication channels, Allocation of Channels, Physical Communication media, Public Switched Telephone Network, Cellular Communication Path, ATM networks.</p>
<p><b>Atmospheric Physics</b></p>	<p>To gain knowledge about Earth atmosphere, Elementary concept of atmospheric sciences, atmosphere and its composition, Thermal and pressure variation in earth atmosphere, Thermal structure of the troposphere, stratosphere, mesosphere and ionosphere, Hydrostatic equation, spectral distribution of the solar radiation, Green house effect and effective temperature of earth. Meteorological process and different system, local winds, monsoons, fogs, clouds, precipitation, Cyclones and anti-cyclones, thunderstorms, Mountain Meteorology.</p> <p>Understanding Atmospheric Dynamics and Thermodynamics, Environmental pollution and climate change</p> <p>Study of Convective measurements of pressure, temperature, humidity, wind speed and direction, sunshine duration, radiation clouds, upper air pressure, temperature, humidity and wind measurements, Pilot balloons, radiosonde, dropsonde, ozonesonde, GPS sonde. Application</p>



	<p>of radars to study the atmospheric phenomenon, LIDAR, SONAR, RASS</p> <p>(Radio- acoustic sounding system), Observational technique for aerosol.</p>
<p><b>Introduction to Nanoscience and Nanotechnology</b></p>	<p>Understanding Emergence of Nanotechnology – Challenges in Nanotechnology, Carbon age–New form</p> <p>of carbon (From Graphene sheet to CNT), Introduction to nanomaterials, evolution of nanoscience, general properties of nanomaterials, role of size in nanomaterials, semiconducting nanoparticles, nanoclusters, quantum wells, conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state. Synthesis of nano structured materials, sol-gel processing, Mechanical alloying and mechanical milling, Inert gas condensation technique, Nanopolymers, Bulk and nano composite materials, top down and bottom up approaches.</p> <p>Study of properties of nanomaterials and characterization techniques.</p> <p>Learning about the applications of nanomaterial to Molecular electronics and nanoelectronics, Quantum electronic devices, Carbon Nano Tube</p> <p>based transistor and Field Emission Display, Biological applications, Biochemical sensor, medical applications and Membrane based water purification. Biological systems- DNA and RNA - Lipids.</p>
<p><b>Self study Courses</b></p>	
<p><b>Advances in High Energy Physics</b></p>	<p>Understanding Gauge Theory and Unification of Fundamentals Forces, Quantum Chromodynamics, Thermal Field Theory and Beyond Standard Model</p>

<p><b>Advances in Laser Physics</b></p>	<p>Understanding Laser Raman Spectroscopy and Laser Spectroscopy in Molecular Beams.</p> <p>To gain knowledge of Modern Laser Spectroscopy.</p>
<p><b>Advances in Solar Physics</b></p>	<p>Learning about Solar Flares: Magnetohydrodynamic Processes, Solar Cycle: Observations and theory, Sun-Earth Connection.</p>
<p><b>Bio-Physics</b></p>	<p>To Know the Basic Concepts of Bio-Physics</p> <p>Understanding Technique For The Study of Biological Structure and Function</p> <p>To study the Radiation Effects on Biological Systems</p>
<p><b>Computer Application in Physics</b></p>	<p>Understanding the role of Computers in Physics, Formulation of a problem for solution on a computer, paradigm for solving physics problems for solution . Algorithms and Flowcharts</p> <p>Learning Scientific Programming (FORTRAN and C language), Scientific Word Processing and Modern Software's For Mathematical Computing (LaTeX and MatLab).</p> <p>Study of Computer Applications to Physical Problems(Numerical Methods and Monte Carlo methods).</p>
<p><b>Medical Physics</b></p>	<p>To know about the mechanics of human body, Physics of Respiratory and Cardiovascular System.</p> <p>Understanding Electricity in the Body and Sound/Light In Medicine and Diagnostic X-Rays and Nuclear Medicine.</p> <p>To gain knowledge about Medical Precision Equipments and Modern Medicines (MRI, PET, CT scan, ventilators, description, working, analysis and clinical applications of Ultrasonic imaging, ECG, EMG, EEG and ERG. Nanotechnology-based drugs e.g. Abraxane, Doxil, C-</p>

	<p>dots (Cornell dots) and goldnano particle as a diagnostic tool, Anti-cancer polymeric nanomedicines, Use of nano-technology in Photodynamic therapy.</p>
<p><b>Optical Communication</b></p>	<p>Understanding Evolution of fiber optic system- Element of an Optical Fiber Transmission link- Ray Optics, Optical Fiber Modes and Configurations -Mode theoryof Circular Wave guides- Overview of Modes-Key Modal concepts- Linearly Polarized Modes -Single Mode Fibers- Graded Index fiber structure.</p> <p>Study of Signal Degradation Optical Fibers and Fiber Optical Sources And Coupling, Fiber Optical Receivers and Digital Transmission System.</p>

**DEPARTMENT OF BOTANY**  
**H.N.B. PG COLLEGE KHATIMA**

**(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 postgraduate and Ph.D. students in the field of plant sciences that serve in academic and research institutions.
3. To serve society's needs and contribute to transforming 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 synthesize 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 organizations and societies.

**PROGRAM OUTCOME:**

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

PO-1: Understand the 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, and their economic and ethnobotanical importance.

PO-5: Differentiate between different types of ecosystems and their structural components.

PO-6: Evaluate services provided by different ecosystems in the 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: Analyze the regeneration status of different tree species in their natural habitat. PO-10. Develop strategies for the conservation of rare and threatened plant species.

PO-11: Develop a protocol for propagation of economically and medicinally important plant species through plant tissue culture.

#### **PROGRAM SPECIFIC OUTCOME (PSOS):**

After the successful completion of the 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 for competitive exams like UPSC, NET, SET, GATE, etc.

PSO 3: Understand the multi-functionality of plants in the 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 U.G. LEVEL:**

1. Students will be able to explain how organisms function at the level of the biomolecules, genes, genome, cells, 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 P.G. 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.

# **DEPARTMENT OF ZOOLOGY**

## **HNB PG COLLEGE KHATIMA**

### **SYLLABUS/PROGRAM OUTCOMES**

1. Acquired the knowledge with facts and figures related to various papers in zoology such as Animal Diversity, Taxonomy, Evolution, Genetics, Biochemistry, Endocrinology, Toxicology and Ecology and animal behavior.
2. Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in the day-to-day life.
3. Acquired the skills in handling scientific instruments, planning and performing in laboratory equipments.
4. The skill of observation and drawing logical inference from the scientific experiments.
5. Analyze the given scientific data critically and systematically and the ability to draw the objective conclusions.
6. Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
7. Realize how developments in any science subject help in the development of other science subject and vice versa and how interdisciplinary approach helps in providing better solution and new ideas for the sustainable development.
8. Develop various communication skills such as reading, listening, speaking, etc.
9. Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

### **SEC (UG LEVEL) PUBLIC HEALTH AND HYGIENE- OUTCOMES**

### M.A. 3<sup>rd</sup> SEM.

PAPER I	Indian Political thought	Students can get the ideology of Indian political thinkers.
PAPER II	Political Ideology	This paper helps the students to understand the knowledge of the world's famous ideologies.
PAPER III	Political thought (from Lenin to Rawls)	The Student will be able to get the knowledge of the ideology of famous communist thinkers.
PAPER IV	Gandhian Discourse in Politics	The Student will get knowledge of the main elements of Gandhian ideologies.
PAPER V	Human Rights / Local self Government/ India in World Affairs	The Students will learn to take an overview on Human Rights, Local self Government and India in World Affairs

### M.A. 4<sup>th</sup> SEM.

PAPER I	Contemporary Political Philosophy	The students will be able to understand contemporary political ideologies.
PAPER-II	Environmentalism	The Student will get the knowledge of environmentalism from political angle.
PAPER III	Post-Cold War International Relations	Students can get the knowledge of the new world order and issues after the post-cold war international relations.
PAPER IV	International Organization	Students can get the knowledge of emerging history and objectives of international military and non-military organization.
PAPER V	Research Methodology/Ethics and Politics	Students can get the basic knowledge of keen factors related with research methods.
PAPER VI	Viva- Voce	To improve the personality development for future prospective.

*P. Chandh*

विभागाध्यक्ष  
राजनीति शास्त्र विभाग  
६०१०४०२० स्नातकोत्तर महाविद्यालय  
खटीमा (ऊधम सिंह नगर)



# **DEPARTMENT OF ZOOLOGY**

## **HNB PG COLLEGE KHATIMA**

### **SYLLABUS/PROGRAM OUTCOMES**

1. Acquired the knowledge with facts and figures related to various papers in zoology such as Animal Diversity, Taxonomy, Evolution, Genetics, Biochemistry, Endocrinology, Toxicology and Ecology and animal behavior.
2. Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in the day-to-day life.
3. Acquired the skills in handling scientific instruments, planning and performing in laboratory equipment.
4. The skill of observation and drawing logical inference from the scientific experiments.
5. Analyze the given scientific data critically and systematically and the ability to draw the objective conclusions.
6. Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
7. Realize how developments in any science subject help in the development of other science subject and via versa and how interdisciplinary approach helps in providing better solution and new ideas for the sustainable development.
8. Develop various communication skills such as reading, listening, speaking, etc.
9. Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

### **SEC (UG LEVEL) PUBLIC HEALTH AND HYGIENE- OUTCOMES**

Students understood the importance of hand washing, sanitation and hygiene, safe drinking water; household cleaning and food safety constitute the main focus for hygiene interventions in the college, home and community level.

#### **OUTCOME OF SPECIAL PAPERS (PG LEVEL)**

1. Fishery Science: Students describe the knowledge necessary for professional or academic work in the field of aquaculture and fisheries.
2. Evaluate the importance of diversity as well as the role of social factors (e.g. culture, economics, policy) on aquaculture and fisheries from local to global scales.
3. Demonstrate the basic technical skill necessary for work in aquaculture and fisheries (e.g. data collection and analysis, scientific methods etc.)
4. Create local and global solution to complex challenges in aquaculture and fisheries.
5. Students become familiar with Earth system and the manner in which they have been modified by human activity over time, especially with regards to coastal ecosystems. Recognize and appreciate the diversity of human culture and their relationship to local and global ecosystems. Develop a personal environmental ethic.

#### **OUTCOMES OF IMMUNOLOGY (PG LEVEL)**

1. Trace the history and development of immunology.
2. Understood the organization of immune system.
3. Learn how cell culture is used for research in cancer.
4. Understand the vaccines and their importance.
5. Learn how cancer defeats the immune system.

#### **OUTCOMES OF IMMUNOLOGY (PG LEVEL)**

1. Learn how microorganisms are used as model system to study basic biology, genetics, metabolism and ecology.
2. Learn laboratory skills i.e. preparation of and viewing samples for microscopy, culture techniques, viewing samples in microscopy to identify microorganisms etc.
3. Overall students develops hypothesis generation and testing, including the development of theoretical and practical skills in the design and execution of experiments.



# **DEPARTMENT OF ECONOMICS**

## **H.N.B. P.G. COLLEGE KHATIMA**

### **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 the national level with special focus on regional socio-economic problems for inclusive development.

### **MISSION**

The mission of the Department 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 an 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 of 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 in society in the field of economics.
- The students with a well-resourced learning environment in economics can serve society as a professional.
- 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.

### **PROGRAM 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.

## **COURSE OUTCOME (CO)**

The department runs degree course at Graduate and Post-graduate level and in this section the program outcome for both levels is given separately.

## **POST GRADUATE LEVEL COURSE (MASTER OF ARTS IN ECONOMICS) CBCS PATTERN (SESSION 2020-21)**

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**

#### **MICROECONOMICS (1<sup>st</sup> and 2<sup>nd</sup> SEMESTER)**

On successful 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 maximization.
- 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 economics through various theories.

### **PUBLIC FINANCE (1<sup>ST</sup> AND 2<sup>ND</sup> SEMESTER)**

On successful 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 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 (1<sup>st</sup> AND 2<sup>nd</sup> SEMESTER)**

On successful 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 trade and 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 (1<sup>ST</sup> SEMESTER)**

On successful 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 sections to understand Indian Economic Thoughts.

### **QUANTITATIVE TECHNIQUES IN ECONOMICS (1<sup>ST</sup> SEMESTER)**

On successful 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 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 of Index Numbers for solving various economic problems.

## **INDIAN ECONOMIC DEVELOPMENT AND POLICY (2<sup>nd</sup> 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 (2<sup>nd</sup> 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 successful completion of the course the students will be able to understand

- Understanding and measuring the National income.
- 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 successful 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 labor market with special reference to Indian Labor Market.
- They will understand the recruiting methods followed by industries to recruit the industrial labor.

- 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 successful completion of the course the students will be able to

- 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 successful completion of the course the students will be able to

- Develop ideas for the basic concept of the 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 successful 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**

## **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 behavior and functioning of industries.
- This also gives insight into how the firms organize 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.
- 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 the Economy of Uttarakhand
- Understand the importance of Human resources in the economy of Uttarakhand and the concept of migration and inequality in rural areas.
- Understand the planning part of the economy as well as the magnitude of regional imbalances and regional planning in India
- Understand the Industrial structure of Uttarakhand economy.

## **GRADUATE LEVEL COURSE**

### **(BACHELOR OF ARTS IN ECONOMICS)**

#### **SEMESTER LEVEL – I & II**

#### **MICROECONOMICS I & II**

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

- The behavior of individuals and small organizations with the help of various theories developed in their respective field.
- It will result in equipping the students with the various aspects of consumer behavior 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 successful 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.
- This will help them to understand and analyze 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 successful 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**

### **PROBLEMS AND PROSPECTS OF INDIAN ECONOMY I & II**

On successful 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 successful 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.

  
विभागाध्यक्ष

अर्थशास्त्र विभाग

हेन०ब०रा०स्नाना उत्तर महाविद्यालय  
खटीमा (ऊ० सिंह नगर)

- ❖ Vocational course is also to be done in this semester (each of 4 credits).
- ❖ During the fifth and Sixth semester the students will have to go through two discipline specific core in theory paper (each of 4 credits ; total 8+8=16 credits) and one Practical paper (each of 2 credits ; total 2+2=4 credits).
- ❖ Apart from this co-curricular course is must in each semester. The major research project is compulsory in fifth and sixth semester separately. ( each of 4 credits)

**Programme outcomes (POs) :**

PO 1	<ul style="list-style-type: none"> <li>• This course will provide students the basic concept of Education</li> <li>• The student will be able to understand relation between education and society.</li> <li>• The student will be able to analyse Indian and western philosophy.</li> </ul>
PO 2	<ul style="list-style-type: none"> <li>• The student will be able to understand new trends and importance of ICT.</li> <li>• The student will be able to explain the importance of human rights, environment in our life.</li> <li>• The student will be able to explain the importance of values, mental health and hygiene.</li> </ul>
PO 3	<ul style="list-style-type: none"> <li>• Students will be able to understand interdisciplinary nature of the subject.</li> <li>• Program will be helpful in conceptualization and synthesis of knowledge of life skill and sustainable education.</li> </ul>
PO 4	<ul style="list-style-type: none"> <li>• Program will be helpful in conceptualization and synthesis of knowledge of Educational aspects in relation to: Human Development- Human Behavior, Teaching Learning, Measurement and Evaluation, Society and Nation.</li> </ul>
PO 5	<ul style="list-style-type: none"> <li>• The student will be able to understand importance of research and statistics in education.</li> </ul>
PO 6	<ul style="list-style-type: none"> <li>• The student will be able to analyse administration and management in education.</li> <li>• The student will be able to explain the glorious history of education.</li> </ul>



**Programme specific outcomes (PSOs) :**  
**UG I Year / Certificate Course in FUNDAMENTAL EDUCATION**

1. This course provides the basic ideas and concepts of education and role of society in education.
2. This course has attempted to introduce students the philosophical basis of education, explaining how the Constitutional system of the nation contribute in the field of education
3. This course intends to clarify the educational aims and functions.
4. This course will help students to understand the contribution of great western and Indian philosopher in education.
5. This course introduces the challenges faced by Indian Education and initiates a critical analysis of concerns and solutions towards better education.
6. Program will be helpful in conceptualization and synthesis of knowledge of life skill and sustainable education.
7. The student will able to explain the importance of values, mental health and hygiene.

**Programme specific outcomes (PSOs) :**  
**UG II Year/ Diploma in PERSPECTIVES OF EDUCATION**

- A. The course aims to acquaint students with characteristic features of ancient, medieval and British education system and educational commissions set up from time to time.
- B. The student will able to explain the glorious history of education.
- C. This course will help students to understand constitutional values and provisions for education and their rights.
- D. This course provides the basic ideas and concepts of human right and environmental education.
- E. This course introduces the students about concept of New Trends in Education and importance of ICT.
- F. It explores the process of development and learning Through ICT.
- G. The students will be able to check different aspects of psychological parameter which are important for education through the tests and scales.

**Programme specific outcomes (PSOs) :**  
**UG III Year / Bachelor of Arts in EDUCATION**

- This Course enables the students to understand basic concept of psychological foundations of education and teacher education.
- This course consists of the knowledge of history of teacher education and various types of teacher education programmes in India.
- This program will be helpful in conceptualization and synthesis of knowledge of Educational aspects in relation to: Human Development- Human Behavior, Teaching Learning process.
- The programme will be helpful to know the major theories, concepts and mechanism which explain human behavior or various psychological phenomena.
- This course will enhance ability of students to interpret the design and conduct of basic research in education.
- This course provides the assessment and evaluation techniques used in Education by psychological tools.
- This course enables the students to understand concepts and needs of statistics in education.
- This course consists of the knowledge of Educational Administration and Management in schools.
- It will develop an insight about the organizational and Administrative structure of Education.
- This course discusses about the various governing/regulatory bodies of the Indian Education System.
- The student will able to understand importance of research and statistics in education.
- This Program will be helpful for students to understand MS Office and able to interpret /present research data diagrammatically or graphically with the help of computer.
- This course enables the students to understand concepts, needs and importance of Guidance and Counseling in our life.

<p><b>PSO 1</b></p>	<ul style="list-style-type: none"> <li>➤ The student will be able to understand the concept of psychological foundations of education.</li> <li>➤ To know the different psychological major theories of learning, intelligence and personality.</li> <li>➤ Students will be able to conceptualize the knowledge of Educational aspects in relation to human development.</li> </ul>
<p><b>PSO2</b></p>	<ul style="list-style-type: none"> <li>➤ The student will be able to understand the concept and need of teacher education.</li> <li>➤ The student will understand history of teacher education and various types of teacher education programme in India.</li> </ul>
<p><b>PSO 3</b></p>	<ul style="list-style-type: none"> <li>➤ The student will enhance ability to interpret design and conduct basic psychological research.</li> <li>➤ The student will be able to understand importance of research and statistics in education.</li> <li>➤ This course enables the students to imply statistics in research work in education.</li> </ul>
<p><b>PSO 4</b></p>	<ul style="list-style-type: none"> <li>➤ The students will be able to explain the concept and needs of Administration and Management in Education.</li> <li>➤ It will develop an insight about the organizational and Administrative structure of education.</li> <li>➤ The students will understand types of educational planning.</li> </ul>
<p><b>PSO 5</b></p>	<ul style="list-style-type: none"> <li>➤ This paper enables understanding about the various governing/regulatory bodies of the Indian Education System.</li> <li>➤ The student able to conduct the assessment and evaluation techniques used in Education with the help of psychological tools.</li> </ul>
<p><b>PSO 6</b></p>	<ul style="list-style-type: none"> <li>➤ The students will be able to understand computer programme MS Office and able to interpret /present research data diagrammatically or graphically with the help of MS Office.</li> <li>➤ This course enables the students to understand concepts, needs and importance of Guidance and Counseling in our life.</li> <li>➤ The students will be able to analyze difference between Guidance and Counseling.</li> </ul>

**DEPARTMENT OF ENGLISH**  
**H.N.B. POST GRADUATE COLLEGE KHATIMA**  
**PROGRAMME OUTCOME**

The main programme outcomes of M. A. in English are:

- Students shall be able to read, interpret, understand and write about diverse range of texts in English analytically and critically
- Students shall be able to analyze texts of a variety of literary genres in terms of style, figurative language and convention.
- Students shall be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
- Students shall be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students shall be able to ethically gather, understand, evaluate and synthesize information from a variety of written and web sources.
- Students shall be able to understand the growth of literature in India in English translation from classical to modern times.
- 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.
- Students shall be educated in both artistry and utility of English language through the study of literature and other contemporary forms of culture.
- 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.
- Students shall become good human beings as the course shall teach them the true philosophy of life.

*[Signature]*

# **DEPARTMENT OF GEOGRAPHY**

## **H.N.B. P.G. COLLEGE KHATIMA**

### **VISION OF THE DEPARTMENT**

Geography as a subject is offered at the undergraduate and postgraduate level to Arts, Science, and 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 society. Also, they will be to appreciate the current usage of in various fields of importance in agriculture, business, and industry. Further, the students will be exposed to the current trends in understanding basic physical and Human systems that affect everyday life (e.g. earth-sun relationships, water cycles, wind and ocean currents Population, settlement and 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 a random scattering of people and places.
- Enable to have sound knowledge of the theory and practical for understanding core subjects
- Facilitate the development and application of problem-solving skills in students.
- After all students are 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 a 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 of 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.
- Motivate students involved in self-reflexivity and lifelong learning.
- To inspire students in integrating different aspects of physical, practical, aesthetic, moral and intellectual dimensions of education to develop a holistic personality of each student.
- To help the student in becoming a responsible citizen for the nation and a sensitive and creative human resource for the society's 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, and 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 leaders from local to global levels.

**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.

## **SEMESTER COURSE FRAMEWORK**

### **SEMESTER-I**

#### **Geography (B.A/B. Sc)**

#### **PAPER I -PHYSICAL GEOGRAPHY (GUGP-101)**

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

- This course will familiarize students with 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: origin and classification.
- Interpret the Origin of continents and ocean basins and related theories, and describe Mountains, Plateaus and Plains, Gradational processes, Weathering and Erosion.
- Analyze Composition and structure of the atmosphere, Insulation, Vertical and Horizontal Distribution of atmospheric temperature Pressure and pressure belts, and Wind: 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**

**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 Techniques) (GUGP-P-103)**

**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)**

**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)**

**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
- Describe 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)**

**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**

### **PAPER I- CLIMATOLOGY AND BIOGEOGRAPHY (GUGP-301)**

**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**

**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
- Describe 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)**

**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**

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

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
- Describe Urban areas and the conurbation, Rural-urban fringe, Umland
- Describe Functional classification of towns, Hierarchy of urban settlement, Town planning: Meaning and principles

### **PAPER II- ENVIRONMENTAL GEOGRAPHY (GUGP-P-402- (a))**

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)**

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**

**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, Intersection, Close Traverse, Open Traverse, and Correction of bearing
- Perform Plane Table Surveying: Radiation, Intersection, Close Traverse, Open Traverse, Resection by two point and three-point problems
- Measure height/depth by Indian Pattern Clinometer

## **SEMESTER-V**

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

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))**

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**

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**

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- PROJECTIONS**

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**

### **PAPER I- ECONOMIC GEOGRAPHY**

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))**

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 systems in Development Planning

## **PAPER-II- POLITICAL GEOGRAPHY**

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))**

**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, Economic, 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 Planning.

## **PAPER III- PRACTICAL- STATISTICAL TECHNIQUES AND GEOINFORMATICS**

**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)

*Manoj K. Singh*

*Department of Geography*

## 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।

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निर्धारित पाठ्यक्रम

प्राचीन एवं भक्तिकालीन काव्य : सम्मिलित कवि – चंदबरदाई, कबीर, जायसी, सूरदास एवं तुलसीदास  
(पाठ्यपुस्तक प्रो. मानवेन्द्र पाठक द्वारा सम्पादित)

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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

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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

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#### 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

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#### 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)

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## 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)

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## VII

सप्तम प्रश्नपत्र - छायावादोत्तर 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)

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## 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)

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## 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।

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### 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)

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### 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

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## 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 घिल्डियाल '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 सांखियाँ 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: संपा० 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: संपा० 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: संपा० रवीन्द्र कुमार जैन (व्याख्या हेतु प्रारंभिक 50 दोहे), नेशनल पब्लिशिंग हाउस, नई दिल्ली।
5. घनानंद: घनानंद कवित्त: संपा० 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

**XIV(ग)**

**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।)

### **XV(क)**

**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

**XV(ख)**

**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)

अथवा

**XV(ग)**

**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

**XV(घ)**

**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

### XV(ड)

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  
अथवा

तारापथ- सुमित्रानंदन पंत, लोकभारती प्रकाशन, इलाहाबाद।

टिप्पणी: सुमित्रानंदन पंत का संपूर्ण साहित्य पाठ्यक्रम में है। उक्त पाठ्यपुस्तक से व्याख्या पूछी जाएगी।

अथवा

### XV(च)

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)

अथवा

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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

**XV(ज)**

**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 ।

### **XVI**

#### **(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 ।

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 ।
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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 ।

### **XVI**

#### **(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 ।

**DEPARTMENT OF HISTORY**  
**HNB PG COLLEGE KHATIMA**  
**BA FIRST YEAR**

**Paper 1- Ancient History**

Studying ancient history allows Students to understand where they have come from and why they are here, and by doing so, shows us how the ancients' attempts to shape their futures relate to our own actions in the present day.

**Paper 2-World History**

Through world history, students can learn how past societies, systems, ideologies, governments, cultures and technologies were built, how they operated, and how they have changed. The rich history of the world helps us to paint a detailed picture of where we stand today.

**BA SECOND YEAR**

**paper 1- Medieval History**

The medieval Indian period is an important period for students of history because of the developments in the field of art and languages, culture, and religion. Also, the period has witnessed the impact of other religions on the Indian culture and various political dimensions.

**Paper 2 -World History**

Students can learn about the pillars upon which different civilizations were built, including cultures and people different from their own.

**BA THIRD YEAR**

**Paper 1- Modern History**

Students will be able to understand India in 1707, British Expansion. Changes were introduced by the British. Popular Uprising and Revolts against the British. Socio-Religious Movements. The emergence of Indian Nationalism and India's struggle for independence

## **PAPER 2- INDIAN SOCIETY AND CULTURE**

Education is an important part of a student's life, and it calls for a system designed to support the student's overall development and growth. With the passage of time, conceptualization has improved, resulting in a positive shift in the delivery of knowledge to students. People are looking for more holistic and effective development of their children rather than just focusing on academic excellence. Also, since its inception, modern education has had a significant impact on Indian society and culture. On the one hand, it provided the key to the treasures of modern scientific and democratic thought to the Indian intelligentsia, and on the other hand, it might also disassociate people from their cultural roots, and fade Indian values.

## **MA 1<sup>st</sup> SEMESTER**

### **PAPER 1- WORLD HISTORY (1453- 1648 AD)**

World history is full of stories and facts. Some are inspiring and uplifting; others are chaotic and immoral. Tap into the vivid realm of history, and there are many vital lessons students need to learn. They will study times of suffering and times of joy, and the lessons they learn here can then be applied to their own life experience.

### **PAPER 2 HISTORIOGRAPHY: SOURCE AND EARLY TRENDS**

Historiography is important for a wide range of reasons. First, it helps us understand why historical events have been interpreted so differently over time. In other words, historiography helps students examine not only history itself, but also the broader overlying characteristics that shape the recording of history itself.

### **PAPER 3 - HISTORY OF UTTARAKHAND (FROM THE BEGINNING TO CHAND PERIOD)**

Students need to know about the history of Uttarakhand and its importance. In the Puranas, Uttarakhand was the ancient term for the central Indian Himalayas. Its peaks and valleys were known as *Svargaloka*: a temporary abode of the righteous, and the source of the Ganges. At that time, present-day Uttarakhand was also reportedly inhabited by rishis and sadhus. Uttarakhand is known as "the land of the gods" (Devbhumi) because of its number of Hindu pilgrimage sites.



During the Vedic period, several small republics known as Janapada existed in this region. The Pauravas, Kushanas, Kunindas, Guptas, Katyuris, Palas, Chands, Parmars (or Panwars), and the British have ruled the state by turns.

#### **PAPER 4- POLITICAL AND ECONOMIC HISTORY OF DELHI SULTANATE (AD 1206-1526)**

The Delhi Sultanate is very important for students because it started the Muslim Rule in India. Before that, it was the Rajputs under Prithiviraj Chauhan who ruled over Delhi and the surrounding areas. The start of Muslim rule brought in great cultural diversity which became an important and invaluable feature of our country.

#### **PAPER 5 - SOCIETY AND CULTURE OF INDIA**

The medieval period is an important era in Indian History for the development in the field of art, languages, culture, and religion, so students need to know about this period

Studying history opens up amazing avenues for a career. History is an academic discipline dealing with the study of societies and cultures of a certain time period or long periods of time, to enhance our understanding of the past.

A degree in history provides you with a set of transferable skills that are applicable to a wide range of careers such as law, publishing, journalism and the media, museums, librarianship and archive work, teaching, advertising, work in the development sector, global charity work, Civil Services, and other competitive examinations and Academic Research fields, etc. Having a degree in history, you can specialize in various fields. At the graduate and postgraduate levels, most of these courses are offered nationwide.

A history degree, backed by specialization at the Master's level, can pave the way to a number of careers. Here are eight career options you can go for after a degree in History:

##### **1. ARCHAEOLOGY**

The work of an archaeologist can be research-based or field-related. It includes excavation, but that is only one aspect of archaeology. You are free to specialize in particular objects of study. For instance, you can be an expert on coins called a numismatist, or an epigraphist who decipher

inscriptions. The Archaeological Survey of India (ASI) employs archaeologists and is entrusted with the maintenance of 3,600 monuments, state departments of the archaeology of different state governments, heritage bodies, museums, and other research institutions.

## **2. MUSEOLOGY**

Museologists or specialists in museology are the ones who deal with the design, organization, and management of museums. Their work is filled with research, administration, and public relations. For instance, The National Museum Institute (New Delhi) offers master's in Museology.

## **3. MUSEUM CURATORS**

Museum curators specialize in natural history, metals, terracotta, textiles, paintings, and other related things. The field requires an artistic and aesthetic bent of mind along with administrative skills. It also includes maintenance of records of each item, for instance, from where it has been discovered or acquired, its estimated age, conservation treatment, and such details.

## **4. ARCHIVISTS**

Archivists are experts in preservation, repairing parchment and paper manuscripts, and microfilming documents. They get work in museums, libraries, the National Archives of India, and different state archives.

## **5. HISTORIANS**

A historian's job is to study and research history, and communicate it through written or published works. The prerequisite to becoming a historian is a bachelor's degree in history followed by a Masters in specific areas such as political history, military history, etc.

## **6. HISTORY EXPERTS**

There is a tremendous demand for History experts in movie houses as well who could undertake research work for costumes, jewelry, and movie sets. These experts work closely with both the director and the cinematographer. A history expert can go for a production house as a research analyst as well.

## **7. TEACHERS**

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 ।

### **XVI**

#### **(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 ।

SEM 4th

MAY -401	Yoga therapy	<ul style="list-style-type: none"> <li>• Student will learn how to cure different diseases with the help of yogic practices.</li> </ul>
MAY -402	Teaching methodology in yoga	<ul style="list-style-type: none"> <li>• . In this paper students will learn about how they can conduct their yoga class in different interesting manner.</li> <li>• They will learn how to apply teaching techniques in their classes.</li> </ul>
<b>Elective subjects</b>		
MAY -403	Marma therapy	<ul style="list-style-type: none"> <li>• In this paper students will learn about marm therapy to cure disease.</li> </ul>
MAY -404	Principles of Ayurveda	<ul style="list-style-type: none"> <li>• . Students will come to know about various herbal medicines, special diets, medicinal herbs and oils</li> </ul>
MAY -405	Applied Yoga	<ul style="list-style-type: none"> <li>• With the help of this paper student will understand how to apply their yoga knowledge in the felid of health, sport and physical education.</li> </ul>
MAY -406	Dissertation	<ul style="list-style-type: none"> <li>• Student will choose particular topic for their research work.</li> </ul>
MAY -407	Practical-1	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asana, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
MAY -408		<ul style="list-style-type: none"> <li>•</li> </ul>



**MA**  
**(Yoga and Alternative  
Therapies)**

**DEPARTMENT OF YOGIC SCIENCE**  
**H.N.B.PG.COLLEGE, KHATIMA**  
**KUMAUN UNIVERSITY NAINITAL**  
**(UTTARAKHAND)**

S. N.	Code		<i>Outcomes</i>
1	MAY – 101	Fundamentals of Yoga	<ul style="list-style-type: none"> <li>● Students of the UG course will have an understanding of Yoga, its origin, history and development of Yoga.</li> <li>● Introduction of Yoga according to various texts.</li> </ul>
2	MAY –102	Principles of Hath Yoga	<ul style="list-style-type: none"> <li>● Students will know about the all hath yogic scriptures, and get to know their different perceptive aspect about yogic practices. With the help of hath yoga techniques, students will get holistic health</li> </ul>
3	MAY –103	Human Anatomy & Physiology	<ul style="list-style-type: none"> <li>● The objectives behind teaching Anatomy and Physiology is to</li> <li>● Make students familiar with the systems of the body.</li> <li>● Give a hand on experience about the human body using models, charts and pictures.</li> <li>● Make students understand the organization of the body with respect to structural components.</li> </ul>
4	MAY –104	Bases of Psychology	<ul style="list-style-type: none"> <li>● Students will learn different perceptive of human psychology like- learning, emotion, motivation, intelligence, dream etc.</li> </ul>
5	MAY –105	Practical-1	<ul style="list-style-type: none"> <li>● Make the students aware of the asana for physical fitness and healthy life.</li> <li>● Know and understand about breathing practices.</li> </ul>
6	MAY –106	Practical-2	<ul style="list-style-type: none"> <li>● Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

## SEM 2

L = Lecture    T = Tutorial    P = Practical    CT = Cumulative Test    TA = Teacher Assessment

MAY –201	Patanjal Yoga sutra	<ul style="list-style-type: none"> <li>• Understand various modification of mind and the means of inhibiting them.</li> <li>• Have an understanding about the essence of Samadhi and Sadhana Pada.</li> <li>• Understand the essence of Vibhuti and Kaivalya pada.</li> </ul>
MAY –202	Yoga and Mental Health	<ul style="list-style-type: none"> <li>• Students will learn about mental health and mental disorders and relationship between yog and mental health.</li> </ul>
MAY –203	Alternative therapies	Students will come to know about the treatment of common ailments through alternative therapy.
MAY –204	Yoga in Upanishadas	<ul style="list-style-type: none"> <li>• Students will come to know about Indian Philosophy, upnishad and culture. Have an idea about the major principal Upanishads</li> <li>• Understand the essence of each Upanishad and how to put them into practice.</li> <li>• Understand each Upanishad and the role of it in our day to day life.</li> </ul>
MAY –205	Practical-1	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
MAY –206	Practical-2	<ul style="list-style-type: none"> <li>• In this practice student will make lesson plans for conducting the classes.</li> <li>• Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

**SEM 3rd**

MAY -301	Research Methodology& Statistics in Yoga	<ul style="list-style-type: none"><li>• In this paper students get to know about all the aspects of research like research procedure ,statistical analysis etc.</li></ul>
MAY -302	Principles of Naturopathy	<ul style="list-style-type: none"><li>• Students will learn about the nature cure treatment. Students learn mud therapy, hydrotherapy, fasting ,massage etc.</li></ul>
<b>Elective subjects</b>		
MAY -303	Essay E-III	<ul style="list-style-type: none"><li>• In this paper they overlook all the aspect of yoga.</li></ul>
MAY -304	Yoga & Personality Development E-IV	<ul style="list-style-type: none"><li>• Students will learn different aspects of personality , measurements of personality etc.</li></ul>
MAY -305	Yoga and personal Management	<ul style="list-style-type: none"><li>• Students will get to know how they will manage themselves like:- self management, self confidence, will power, etc</li></ul>
MAY -306	Yoga and health E-VI	<ul style="list-style-type: none"><li>• Students will study about health, diet, chakras, kundalini, panchprana and yogic management of different diseases.</li></ul>
MAY -305	Practical-1	<ul style="list-style-type: none"><li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li></ul>
MAY -306	Practical-2	<ul style="list-style-type: none"><li>• Research project work and advance practices of shatkarma and mudra and bandha make students more capable and knowableable.</li></ul>



**DEPARTMENT OF MATHEMATICS**  
**H.N.B. PG COLLEGE KHATIMA**

**Programme Outcomes (POs)**

The Students of mathematics studying at Under Graduate and Post Graduate level are prepared to enrich their knowledge in :

**PO-1** : Framing practical real life problem with the help of Mathematics and operation research.

**PO-2** : Finding the solution of problem and taking appropriate decision on them using different techniques and formulae used in Mathematics, Statistics and operation research.

**PO-3** : Understanding and handling of software like MS OFFICE, EXCEL ORIGIN, MATLAB etc. dealing with the problems.

**PO-4** : Delivering the knowledge acquired in the form of presentation and documentation with the society and colleagues effectively.

**PO-5** : Working efficiently towards a project in a team or to frame their own project dealing with real life problem in a competent world.

**PO-6** : Collecting research literature in framing new research problem, formulating the problem in mathematical form, finding their solution numerically and graphically with the different methods analytically or using MATLAB, EXCEL etc. and interpreting their results. **PO-7** : Different technological and industrial applications of nuclear reactors, solar collectors, electronic cooling and food mixing are greatly influenced by the nanofluids due to their increasing thermal conductivity and stability property. In the fields of engineering space technology and the processes taking place at a very high temperature, the importance of radiative heat transfer is observed. The nanofluid flow affects the heat and mass transfer flow in a medium. The students are given main thrust to formulate real world problems related to the nanofluid flow and to find the solution numerically and interpret its result in the social life for the society. These problems require the uses of EXCEL, ORIGIN and MATLAB etc.

*Bhatt*

**Programme Specific Outcome (PSOs)**

The students of mathematics background after passing at Under Graduate and Post Graduate level will be able to:

**PSO-1** : Get admission for further studies like research in Mathematics, Statistics or Operation Research in other reputed National and International Institutions.

**PSO-2** : Find the excellent jobs in Government/Public / Private Institutions in India/Abroad and will serve for the society and nation.

**PSO-3** : Find a place in the society to furnish the jobs for the people in need.

**PSO-4** : Form a project dealing with the real life situation happening around us by using mathematical aspects and find its solution which will be helpful for the people.

*Bhatt*

**PG DIPLOMA**  
**(Yoga and Alternative**  
**Therapies)**

**DEPARTMENT OF YOGIC SCIENCE**  
**H.N.B.PG.COLLEGE, KHATIMA**  
**KUMAUN UNIVERSITY NAINITAL**  
**(UTTARAKHAND)**

## 1<sup>st</sup> SEMESTER

<b>S.N.</b>	<b>Sub Code</b>	<b>Title of the Paper</b>	<b>OUTCOME</b>
1	DYAT-101	Introduction of Human Consciousness and Yoga	<ul style="list-style-type: none"><li>• Students of the UG course will have an understanding of Yoga, its origin, history and development of Yoga.</li><li>• Introduction of Yoga according to various texts.</li></ul>
2	DYAT-102	Hath Yoga	<ul style="list-style-type: none"><li>• Students will know about the all hath yogic scriptures, and get to know their different perceptive aspect about yogic practices.</li><li>• With the help of hath yoga techniques, students will get holistic health.</li></ul>

3	DYAT-103	Teaching Methodology in Yoga	<ul style="list-style-type: none"> <li>• In this paper students will learn about how they can conduct their yoga class in different interesting manner.</li> <li>• They will learn how to apply teaching techniques in their classes.</li> </ul>
4	DYAT-104	Human Anatomy & Physiology	<ul style="list-style-type: none"> <li>• To know about the structure of the body</li> <li>• To know about the necessary functions of the body</li> <li>• To give brief idea about the diseases related to each system</li> <li>• To throw light on anatomy so that student can experience the involvement of their body parts while practicing various postures of yoga.</li> </ul>
5	DYAT-151	Practical – I	<ul style="list-style-type: none"> <li>• Make the students aware of the asana and pranayama for healthy life.</li> <li>• Know and understand about shatkriya practices for purify whole body.</li> </ul>
6	DYAT-152	Practical – II	<ul style="list-style-type: none"> <li>• In this practice student will make lesson plans for conducting the classes.</li> <li>• Each student has to prepare and deliver 10 Lesson plans (Five Asanas +Three Pranayama +Two Shatkriyas) during the session.</li> </ul>

## 2<sup>nd</sup> SEMESTER

S.N	Sub Code	Title of the Paper	OUTCOME
1	DYAT-201	Patanjal Yoga	<p>Following the completion of this course, students shall be able to</p> <ul style="list-style-type: none"> <li>• Understand various modification of mind and the means of inhibiting them.</li> <li>• Have an understanding about the essence of Samadhi and Sadhana Pada.</li> <li>• Understand the essence of Vibhuti and Kaivalya pada.</li> </ul>

2	DYAT-202	Yoga & Health	<ul style="list-style-type: none"> <li>• Student will come to know about what is the actual meaning of health according to Indian scriptures; student will come to know about holistic health.</li> <li>• "Diet is medicine" mean knowledge of diet therapy given to this paper.</li> </ul>
3	DYAT-203	Naturopathy	<ul style="list-style-type: none"> <li>• Students will learn about the nature cure treatment. students learn mud therapy, hydrotherapy, fasting, massage etc.</li> </ul>
4	DYAT-204	Yoga and Alternative Therapy	<ul style="list-style-type: none"> <li>• Students will come to know about alternative therapies to cure diseases.</li> <li>• Alternative therapies like Pranic healing, Magnet therapy, Acupressure, Yagya therapy, Medicinal plant therapy, swara therapy etc.</li> </ul>
5	DYAT-251	Practical – I	<ul style="list-style-type: none"> <li>• Students will learn advance and higher level shatkriyas, asanas, pranayama, mudra and bandha and meditation practices to improve their skills.</li> </ul>
6	DYAT-252	Practical – II	<ul style="list-style-type: none"> <li>• Assignment on any Five Alternative Therapies will help student to get deep knowledge of treatments of diseases.</li> </ul>



# DEPARTMENT OF PHYSICS

## HNB PG COLLEGE KHATIMA

**PROGRAM OUTCOMES (POS):** The Physics department offers two programs:

1. Physics for B.Sc. students of PCM.
2. M.Sc. Physics.

Both these programs are primarily geared towards cultivating the idea – “*Physics is the study of nature and its laws (till the most fundamental level)*”, amongst the students. The Program Specific Outcomes (PSOs) and the Course Outcomes (COs) of the individual programs/courses/papers are more or less spun around this theme and are listed below.

**Program Specific Outcomes (PSOs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM)

**PSO1:** Understanding the fundamental concepts of Physics and its basic laws.

**PSO2:** Acquire the necessary mathematical tools and concepts required for understanding the underlying physics.

**PSO3:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical).

**PSO4:** Acquire problem solving skills and ability to apply them to real world physical phenomenon.

**PSO5:** Motivation to pursue higher studies (Postgraduate, Research etc.) in Physics.

**Course Outcomes (COs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM).

<b>Mechanics and Theory of Waves and Oscillations</b>	Understanding vector analysis (applying concepts for problem solving), the nabla operator (Gradient, Divergence & Curl), Differentiation and Integration of Vectors (fields), Integral Theorems (Gauss, Stokes, Green and corollaries). Understanding - Frame(s) of Reference, Newton's Laws (along with application for point particles as well as system of particle), (conservative) force and potential energy, Work-Energy Theorem, Rocket motion.
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Understanding quantities and ideas related to rotational motion- Angular Velocity, Angular momentum, Torque, Moment of Inertia (calculations and related theorems), Conservation of Angular Momentum.

Understanding Newton's law of gravitation, Gravitational Field, Potential & Potential Energy, Central force, Kepler's Laws of Planetary motion, Satellite and Planetary orbits and motions.

Understanding material properties such as elasticity, stress, strain, various elastic constants and their relationships, Experimental methods to determine the various elastic properties.

Understanding fluids at rest (surface tension, excess pressure) as well as in motion (viscosity, flow through capillary tube, Bernoulli's theorem, Poiseuille's formula), Experimental methods to determine surface tension and viscosity.

Understanding Simple Harmonic Motion, the Harmonic Oscillator Equation and solutions, Linearity and Superposition principle, Superposition of Harmonic Oscillations- Collinear(Interference & Beats) and Perpendicular (Lissajous Figures).

Understanding waves and wave motion, Waves on a string (travelling and standing), Normal-modes, Group and Phase velocities. Understanding the Fourier Theorem and its applications.

Understanding Damped Harmonic Oscillations, Over/Under/Critical damping, Relaxation time, LCR circuit.

Understanding Forced Harmonic Oscillations, Transient and Steady state behavior, Resonance and Sharpness, Bandwidth, Quality Factor.

Understanding intensity and loudness of sound waves, Decibels, Ultrasonic waves (generation, detection and uses), Building acoustics, Reverberation time and Sabine's formula, (Acoustic) design of buildings.

<p><b>Electricity and Magnetism</b></p>	<p>Understand the basic concepts of Electrostatics-Field, Flux, Gauss's Theorem with applications, Potential and relation with Field, Potential Energy. Also concept of conductors, dielectrics and capacitance, The Electric-Vector.</p> <p>Understand the basic concepts of Magnetostatics- Biot-Savart's Law and applicatons, The Lorentz Force law, Div and Curl of magnetic field and the magnetic vector potential, Ampere's circuital law, Magnetism in matter (Magnetization, Permeability, Susceptibility) and Types of Magnetic materials (Dia, Para &amp; Ferro). Understanding inductance (self and mutual and induction), Faraday's Law, Lenz' Law &amp; energy conservation, AC circuits- RC, LC and LCR, Resonance.</p> <p>Realizing that EM is contained in the 4 Maxwell's Equations, Understanding equation of continuity, displacement current, Maxwell's correction to Ampere's circuital law. Gain knowledge on EM waves, propagation and their properties using Maxwell's equations, Polarization of EM Waves.</p>
<p><b>Practical (B.Sc. !st Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 1 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Momentof Inertia, Elastic constants, Simple &amp; Compound pendulums, Current, Voltage, Resistances, Solenoid, LCR circuit, SHM, Normal modes of a string etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>
<p><b>Heat Thermo dynamics &amp; Statistical Physics</b></p>	<p>Understanding the basic thermodynamic concepts- State variable, Equilibrium, Heat, Work, Zeroth and First Laws and the concepts of Temperature and Internal Energy, Applications of First Law to various processes (Adiabatic, Isothermal etc.), Mayer's relation.</p> <p>Understanding the need of second law of thermodynamics, Reversible &amp; Irreversible processes, Heat Engine and Refrigerator, Second Law of Thermodynamics (in term of Engines and refrigerators), concept of entropy, the Carnot cycle, second law in terms of entropy change, the Nernst theorem.</p>



Understanding the four thermodynamic potentials, The Maxwell's relations and applications (response functions, Joule-Thompson cooling, Calusius-Clapeyron equation etc.)

Understanding the Kinetic Theory of Gases (towards a microscopic description), Maxwell's velocity distribution law, transport phenomenon, the classical equipartition theorem and its use to determine specific heats of mono-atomic and diatomic gases.

Understanding Blackbody radiation (the first step towards quantum mechanics), Spectral emissive power, Energy Density of Cavity Radiation, The Rayleigh-Jeans Law, Planck's law and deducing Wien's displacement law, Wien's distribution laws (1<sup>st</sup> and 2<sup>nd</sup>), Stefan-Boltzmann law and Rayleigh-Jeans from it.

Understanding Basic postulates of Statistical Physics, Macro and Micro States, Phase Space, Density distribution in phase space,  $\mu$  space representation and its division, Statistical average values, Condition of equilibrium, Stirling's Approximation, Entropy and Thermodynamic probability, Boltzmann entropy relation. Ensembles, Micro -canonical, Canonical and Grand Canonical ensembles, Statistical definition of temperature and interpretation of second law of thermodynamic, Pressure, Entropy and Chemical potential. Entropy of mixing and Gibb's paradox, Partition function and Physical significances of various statistical quantities.

Understanding Maxwell-Boltzmann statistics and Distribution law, Energy distribution function, MaxwellBoltzmann law of velocity distribution (most probable velocity, average velocity, RMS velocity), Limitations of M-B statistics, Elementary idea of quantum statistics.

<p><b>optics</b></p>	<p>Understanding Geometrical Optics- Fermat's principle of extremum path and applications, Cardinal points, Combination of Lenses, Lagrange equation of magnification.</p> <p>Understanding optical instruments- Eye pieces (Ramsden's, Huygen's and Gaussian), Aberrations (and types) and their corrections.</p> <p>Understanding the Interference of Light- The superposition principle, Coherence and conditions for interference, Double slit interference, Division of amplitude and division of wavefront, Fresnel's Biprism, Phase change upon reflection, Thin-film interference (Haidenger and Fizeau fringes), Newton's rings (theory and experimental setup), The Michelson Interferometer and its (experimental) use, Fabry-Perot interferometer.</p> <p>Understanding diffraction of light- Fresnel diffraction, Half-period zones and zone-plate, Diffraction pattern of edge, slit and wire, Fraunhofer diffraction (single, double and multiple slits), The diffraction grating as a measurement tool.</p> <p>Understanding polarization of light- Transverse EM Wave, Plane polarized light (production and analysis), Malus Law, Brewster's Law, The Nicol Prism, Circularly and Elliptically polarized light, Optical rotation, The polarimeter (experimental setup also).</p>
<p><b>Practical (B.Sc. 2<sup>nd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 2 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about thermal conductivity, blackbody radiation, calorimetry, statistical probabilities, dispersion, interference, gratings, lens combinations, polarization etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

**Modern  
Physics**

Understanding the origins of quantum theory- Blackbody radiation and early radiation laws, Planck's (revolutionary) idea (the quantum hypothesis & birth of quantum mechanics), Photoelectric and Compton effects. waves and their wavelength, Davisson-Germer Experiment, Wave-particle duality, The uncertainty principle (position-momentum and Energy-time), Interference experiments with particles.

Understanding the Schrodinger's equation (quantum mechanical equation of motion), Time dependent and time-independent versions, Framework of QM (postulates, wavefunction- properties and physical significance), Probability and Conservation, Operators, Eigenfunctions and Eigenvalues, Expectation values, The free particle wavefunction.

Learning to solve the Schrodinger's equation, Stationary states, Boundary conditions lead to quantization, Potential Step & Barrier and transmission, Potential well (infinite and finite depths), The one dimensional harmonic oscillator in QM, Zero point energy.

Learning to solve the Schrodinger's equation in three dimensions (for spherically symmetric systems), The Schrodinger's equation for the Hydrogen atom and solving it using separation of variables, Angular momentum eigenfunctions (spherical harmonics), Solving the radial equation using Frobenius's method, Emergence of the various quantum numbers (n, l and m).

Understanding the various atomic models- Thomson, Rutherford and Bohr, the Bohr model and the hydrogen spectra, Other quantum ideas/experiments- Bohr-Sommerfeld model and quantization condition, the Stern-Gerlach experiment and electron spin, Electron magnetic moment, Bohr magneton, Larmor's precession, The vector atom model, Space quantization.

Understanding optical spectra (on the basis of the vector atom model), LS and JJ couplings, Selection and Intensity Rules, The fine structure of sodium D lines, Magnetic interactions and Zeeman effect, X-ray spectra and

	<p>Moseley's Law.</p> <p>Understanding basics of radiation, Absorption and Emission (spontaneous and stimulated), The Einstein's A and B coefficients, Metastable states (long living), Population inversion, Pumping, Lasing action and Laser/Maser.</p> <p>Understanding Franck-Condon Principle, Molecular spectra, Rotational, Vibration and Electronic spectra of diatomic molecules, General features of electronic spectra, Luminescence, Basics of Raman effect.</p> <p>Understanding the atomic nucleus, Constituents of the nucleus, properties, Nature of nuclear force, Binding Energy and BE curve, Stable nuclei, The semi-empirical mass formula, Models of the nucleus (Liquid drop and Shell model), elementary particles and their classification schemes.</p>
<p><b>Electronics</b></p>	<p>Understanding Kirchoff's Laws, Superposition Theorem, Constant voltage source and constant current source, Conversion of voltage source into current source, Thevenin's Theorem and procedure for finding thevenin equivalent circuit, Norton's Theorem and procedure for finding Norton equivalent circuit, Maximum power transfer theorem, Applications of Network Theorems, Four terminal Network and h-parameters.</p> <p>Understanding elementary semiconductors and devices (intrinsic, extrinsic-P &amp; N), the PN diode and its characteristics in forward and reverse bias, Zener diode, Optoelectric devices- LEDs, Photodiode and Solar cell.</p> <p>Understanding diode circuits- The rectifier- Half-wave, Full-wave (Centre tapped and Bridge versions), Ripple factor and Efficiency, Filters (C, L, Pi etc.), Clipping and Clamping circuits using diodes, Voltage multipliers, Zener diode and voltage regulation.</p> <p>Understanding transistors and amplifiers- Bipolar Junction transistors (NPN, PNP), Characteristics (input and output) in various configurations (CE, CB &amp; CC), Current gains alpha and beta and their relation, Load line analysis, Q-point, Active, Cutoff and Saturation regions, Transistor biasings; Transistor Amplifiers- Voltage, Current and Power, Class A, B and C amplifiers; The Field Effect Transistor (FET) and the Uni-Junction</p>

	<p>Transistor (UJT)</p> <p>Understanding Oscillator circuits- Feedback (negative and positive), Birkhausen's criterion, RC (Wein bridge and Phase-Shift) &amp; LC (Collector tuned and Colpitt) oscillators and frequency of oscillation, Crystal oscillators, The Multivibrator and various operation modes (Monostable, Astable and Bistable).</p> <p>Understanding Digital Electronics and Circuits- Number systems (Binary etc.) and conversions, Basic Logic Gates (AND, OR &amp; NOT) and realizations using diodes and transistors, Universal Gates (NAND &amp; NOR), Other gates, Boolean Algebra- De Morgan's Theorem, Simplifying logic circuits, Minterm, Maxterm, SOP and POS, Karnaugh Map, Binary arithmetic (addition, subtraction) using circuits- Half/Full adders, Word (4-bit) binary adder-subtractor</p>
<p><b>Practical (B.Sc. 3<sup>rd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 3 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Energy quanta, quantization, diodes, LEDs, rectifiers, power supplies, transistors, amplifiers, oscillators, logic gates, Boolean algebra, logic circuits etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

## **PROGRAM SPECIFIC OUTCOMES (PSOs): FOR M.SC. PHYSICS**

**PSO 01:** Strengthening and further understanding of the fundamental concepts of Physics and its basic laws (as acquired during the Under-graduate studies) by augmenting mathematical rigor (at the Physicists level) along with Physical interpretations (and clear physical picture(s)) of any theory/process/situation.

**PSO 02:** Acquire the necessary mathematical-tools (analytic, approximate, numerical, graphical etc.) and concepts required for understanding the underlying physics and use them to solve complex and advanced problems (including those with real world applications).

**PSO 03:** Gain substantial knowledge in the various (core) branches of Physics- viz. Classical Mechanics, Electrodynamics, Mathematical Methods, Quantum Mechanics, Statistical Mechanics, Condensed Matter Physics, Astrophysics, Electronics, Nuclear Physics, Particle Physics etc.

**PSO 04:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical). Also gradually develop the scientific method by designing and conducting experiments.

**PSO 05:** To get an exposure to research and research methodology during the dissertation work (theoretical and/or experimental) to be performed during the last semester.

**PSO 06:** Motivation to pursue a research/academic career in Physics. Aim towards writing and qualifying in various competitive exams- (e.g. CSIR-UGC-NET, GATE, JEST, BARC, DRDO, Entrance exams of premier research institutes (National & International)).

**PSO 07:** Gain knowledge of the subject along with general competence and analytical skill for employment in other sectors viz. industry, R&D, consultancy, public administration etc.

## COURSE OUTCOMES (COS): FOR M.SC. PHYSICS

<p><b>Mathematical Physics</b></p>	<p>To learn series solution of differential equations, Legendre, Bessel, Hermite, and Laguerre differential equation and related polynomial, physical integral form of polynomials and their orthogonality relations. Generating Function and recurrence relation.</p> <p>Understanding curvilinear Coordinates and various operators in circular, cylindrical and spherical coordinate systems, classification of Tensors, Rank of a Tensor, covariant and contra-variant tensors, symmetric and anti-symmetric Tensors, Kronecker delta symbol. Contraction of Tensor, metric Tensor and Tensor densities, covariant differentiation and Geodesic equation.</p> <p>Understanding function of complex variable, Cauchy's Riemann differential equation, Cauchy's integral theorem, residues and Cauchy's residues theorem, singularities, evolution of residues and definite integral.</p> <p>Understanding Fourier integral and Fourier Transform, Fourier integral theorem, finite and infinite integral, Laplace transform of elementary function (Dirac delta &amp; Green's function), Solution of simple differential equations.</p>
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<p style="text-align: center;"><b>Classical Mechanics</b></p>	<p>Understanding mechanics of a system of particles (Constraints and generalized coordinates, D Alembert's principle, Lagrange equations for holonomic and non-holonomic systems and their applications, conservation laws of linear momentum, energy and angular momentum.</p> <p>Understanding Lagrangian and Hamiltonian Formulations with their applications to various conservative systems, Hamilton Jacobi theory.</p> <p>Understanding Dynamics of rigid bodies including Motion of a rigid body, body and space Reference system, angular momentum and Inertia tensor, Principle axes- Principle moments of Inertia, spinning tops, Euler angles, Infinitesimal rotations.</p> <p>Understanding Central force problem including Action and angle variables, phase integral, small oscillations, Kepler's laws of Planetary motion and their deduction, scattering in a Central field, Rutherford scattering cross section.</p>
<p style="text-align: center;"><b>Quantum mechanics</b></p>	<p>Understanding that our world is inherently quantum and so the proper framework to understand it is Quantum Mechanics.</p> <p>“Establishing”/Understanding the basic framework of QM(Schrodinger's equation, wavefunction and probabilistic interpretation, uncertainty relations etc.).</p> <p>Learning to solve the Schrodinger's (time-independent) equation (various one and three dimensional problems).</p> <p>Understanding the various formulations of QM and their equivalence- Schrodinger, Heisenberg (Matrix) and Dirac formulations.</p> <p>Understanding symmetry in QM- Space and Time translation symmetries as well as Rotational symmetry (Angular momentum, Spin, Addition etc.)</p> <p>Understanding the various approximation methods to solve the Schrodinger's equation (Perturbation, Variational method, WKB approximation) and application to different (stationary) state problems.</p> <p>Applying approximation methods to time dependent problems and treatment of radiation (emission and absorption) via such methods</p>



	<p>(Time dependent perturbation theory, Fermi's Golden Rule, the Semiclassical theory of radiation etc.).</p>
<p><b>Statistical Mechanics</b></p>	<p>Understanding the (average) microscopic description vs. the macroscopic description (as done in Thermodynamics) for a system with large no. of degrees of freedom.</p> <p>Understanding (and calculating within the framework) the various statistical ensembles and the corresponding (thermodynamic) formulations.</p> <p>Application of the statistical ideas to derive/understand the behavior of gases (ideal as well as real).</p> <p>Understanding the basics of Quantum SM (FD &amp; BE stat) and some simple applications.</p> <p>Understanding blackbody radiation as a gas of photons (i.e statistical treatment- BE statistics).</p>
<p><b>Atomic &amp; Molecular Physics</b></p>	<p>Understanding that optical properties of materials and realizing the fact that it are just an application of Quantum Mechanics to atomic/molecular systems.</p> <p>Understanding the atomic and molecular spectra along with their finer features (Fine structure, Vibrational-Rotational spectra).</p> <p>Understanding the effect of electric and magnetic fields on the various spectra via interactions (or charge and/or spin).</p> <p>Understanding the various theories/formulations/models to understand spectra (Vector atom model, LS, JJ coupling schemes, Raman spectroscopy, Heitler-London and Born-Oppenheimer treatments etc.)</p> <p>Understanding the quantum theory of radiation (Einstein's coefficients) and basic working principle of Lasers.</p>

<p><b>Practical (Sem1)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 1<sup>st</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. CRO, SCR, Transistors, Diodes, FET, Amplifiers, Oscillators, Antennas, Amplitude modulation/demodulation etc.). The student should use and develop “hand-skills”, observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>General relativity and cosmology</b></p>	<p>Understanding Christoffels connection as Einstein's connection, Gravitational action, field equations and their general properties, Newtonian limit of Einstein's field equations, Metric in spherically symmetric space-time (Schwarzschild metric), Orbits in the Schwarzschild metric, gravitational collapse of a dust sphere, Schwarzschild black holes.</p> <p>Introduction of Gravitational radiation, Wave equation in linearized theory and plane waves, propagating modes of gravity, gravitational waves in a flat space-time background, propagation of gravitational waves in the curved space-time, Energy and momentum of the gravitational waves, Detection of gravitational waves.</p> <p>Basic Concepts and elementary idea of big-bang and steady state cosmologies, Seagull static models, Cosmological principle, Friedmann space-time, Robertson-Walker line element, Weyl's postulate, expansion of the universe, Hubble's law, dynamical equation of cosmology</p> <p>and their consequences, the primordial fire and the remnant radiation, Big-bang and steady state models of the universe.</p>

<p style="text-align: center;"><b>Advanced Quantum Mechanics</b></p>	<p>Understanding, applying and formulating QM at an even deeper level than done earlier (in the QM Course).</p> <p>Applying quantum ideas to understand the scattering of particles. Employing various (approximate) methods- Partial Wave Analysis and the Born approximation.</p> <p>Understanding notion of identical and indistinguishable. Realizing origin of the Pauli's exclusion principle and related notions (Spin-Statistics connection, Permutation symmetry etc.) Formulation (along with the need) of the relativistic version of (NR) quantum mechanics.</p> <p>Working out in detail the two basic relativistic wave equations (Klein-Gordon and Dirac equations) and the various associated phenomenon/notions (Plane wave solutions, Negative Energies and Probabilities, Spin of electron and its magnetic moment, The Hole Concept, Particles and Antiparticles etc.)</p> <p>Understanding the need of relativistic quantum fields (towards Quantum Field Theory), Field formulations for the various wave equations via 2nd quantization.</p>
<p style="text-align: center;"><b>Nuclear Physics</b></p>	<p>Understanding the atomic nucleus and its various properties along with the experimental tools and techniques of nuclear investigations.</p> <p>Understanding basic properties of the nucleus and the various nuclear models.</p> <p>Understanding the nature of the nuclear force along with experimental setup(s) to study them. Understanding radioactive decay and its various feature.</p> <p>Understanding nuclear reactions by applying (mainly) quantum ideas to them.</p>

<p style="text-align: center;"><b>Elementary Particle Physics</b></p>	<p>Get a basic understanding of the fundamental constituents of our Universe (the “elementary” particles and the four fundamental interactions).</p> <p>Understanding the gauge principle and role of symmetry (along with ideas of unification). Understanding the common (mathematical) origin of (the various) conservation laws as a manifestation of (some) symmetry.</p> <p>A very basic understanding of the unification of the fundamental interactions- Electroweak and Grand Unifications.</p> <p>Understanding (hadronic) matter as composed of quarks and the “construction” schemes (i.e. various direct-product representation of SU(3)). An overview of the various properties of quarks (and also of the composite mesons and baryons).</p>
<p style="text-align: center;"><b>Condensed Matter Physics</b></p>	<p>Understanding of the basic (theoretical) ideas involved in the study of Condensed Matter Physics.</p> <p>Understanding the origin of elasticity (and elastic constants) from the properties of the underlying crystal structure.</p> <p>Understanding the interaction of crystals with radiation (X-rays) and the related theoretical framework as well as experimental setup(s) (Diffraction experiments).</p> <p>Understanding the quantum treatment of elastic/sound waves (i.e. the idea of phonons and phonon gas etc.)</p> <p>Understanding the thermal properties of solids on the basis of the phonon picture.</p> <p>Understanding crystal defects, superconductivity, and magnetism.</p>

<p><b>Practical (Sem2)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 2<sup>nd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. oscillators, electronically regulated power supply, negative feedback amplifiers, FET characteristics, Michelson Interferometer, Fabry Parot Interferometer, four probe method, Fresnel's Law, Magnetic susceptibility, Radiation laws, etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics I</b></p>	<p>Understanding Integrated Circuit technology, Classification of IC's, Fabrication of IC's &amp; components, Basic monolithic integrated circuit technology, processes used in monolithic technology, active &amp; passive components, metal semiconductor contact, thick &amp; thin film IC's, hybrid IC's, charge coupled devices (CCD), advantages &amp; limitations of integrated circuits. Understanding Operational amplifiers (Linear and Non-linear Analogsystems),</p>

<p style="text-align: center;"><b>Advanced Electronics II</b></p>	<p>Understanding Digital communication, Digital signal processing, Image processing (Basic ideas only), Pulse Modulation systems, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse position modulation, Pulse code modulation, Delta modulation Frequency division multiplexing (FDM), Basic idea of digital telemetry.</p> <p>Learning Optical communication, Principle of optical communication, Different modes of propagation of E. M. Wave through optical fibre, Brief concept, classification of fibres and ray path, Advantages of multimode fibres and cladding , Optical Fibre connectors, Optical Fibre communication Receiver, Brief Introduction , Signal path through optical data link, Block diagram of optical Receiver, Advantages of optical communication, Light propagation in cylindrical wave guide.</p> <p>Gaining knowledge of Memory and optoelectronic devices, Bulk and thin films. Photoconductive devices (LDR), Memory devices, static and dynamic random access memories SRAM and DRAM, CMOS and NMOS, nonvolatile-NMOS, magnetic, optical and ferromagnetic memories, charge coupled devices (CCD), LCDS.</p>
<p style="text-align: center;"><b>Electrodynamics</b></p>	<p>Realizing the unification of Electricity and Magnetism as a single physical concept- Electromagnetism (or Electrodynamics) and that Maxwell's equations express this fact. Understanding various electromagnetic phenomenon (EM Wave in vacuum, conductors, non-conductors, plasma, bounded media, wave guides).</p> <p>Understanding the potential formulation of ED (and its advantages).</p> <p>Understanding generation and nature of radiation (fields) from moving (accelerated) charges. Formulating ED (and writing and performing calculations) within the relativistic framework i.e. four-vector &amp; Tensor notations. Understanding the role of this relativistic formulation and ability to apply it elsewhere.</p>

<p><b>Practical (Sem 3)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 3<sup>rd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of this semester (Richardson's Law, ESR spectra, Hall effect, multivibrators, transistor amplifiers cum feedback amplifiers, FET and MOSFET, VTVM etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics 3</b></p>	<p>Understanding power supply regulation including Servomechanism, regulation using OA, Zener reference source, The 723 regulator current regulator, short circuit and over load protection, Precision rectifier, IC regulated power supply. Three terminal voltage regulations, dual Polarity regulated power supplies using 78 XX and 79 XX series regulators, Switched mode power supply (SMPS), Active filter , PLL understanding microwave production with basic ideas of Microwave frequencies, Principle of velocity modulation. Reflex klystron. Theory and uses an of cavity magnetron PIN &amp; GUNN Diode, Detection of microwave measurement of power.</p> <p>Understanding Advantages and Disadvantages of Microwave transmission, loss in free space, propagation of microwaves, atmospheric effects on prorogation , Fresnel zone problem, ground reflection, fading sowlles, detectors, components, antennas used in microwave communication system.</p>
<p><b>Advanced Electronics 4</b></p>	<p>Understanding Ananlog computation with Solution of ordinary linear differential equations with constant coefficients, Operation modes of analog computers, repetitive operation of computers, Time scaling,</p>

	<p>amplitude scaling, Generation of functions, Simulation of time varying systems.</p> <p>Understanding Boolean algebra, Canonical forms of Boolean, functions, Simplification of Boolean functions (K-map, Tabulation method), don't care conditions. Digital logic families;</p> <p>Adders &amp; Subtractors, Magnitude comparator, Code converters; Parallel adders, Encoders, Decoders, Multiplexers, Demultiplexers, Parity bit generator and checker, Read only memory (PROM, EPROM), P.L. Digital to Analog and Analog to Digital converters.</p> <p>Understanding Sequential logic- Memory element, RS, JK, JKMS, T type and Edge triggered Flip flop; Registers; Shift register; Counters— synchronous and Synchronous; The memory unit; Semiconductor Random Access Memory; Inter-register transfer; Arithmetic; Logic and Shift Micro-operation; Fixed point and floatation point data.</p>
<p><b>Practical (Sem 4)</b></p>	<p>Study of regulated power supply (723), operational amplifier (741), Timer (555), A to D and D to A converter, Logic gates (Different types), amplitude and frequency modulations and demodulations, different flip-flop circuits (RS, JK, Dk type, T-type, Master slave), Digital combinational and sequential circuits, Microprocessor (8085), SCR etc.</p>
<p><b>Dissertation/ Project</b></p>	<p>The student has to complete a dissertation/project (theoretical and/or experimental) and submit a written report during this last semester. This gives the students some exposure to research and research methodology. Moreover the written report enables the students to write scientific communication. All this is aimed at nurturing them into (possible) future researchers who are capable of- (a) thinking and analyzing critically and clearly (b) adopting the scientific method and (c) working independently.</p>
<p><b>Elective Courses</b></p>	



<p><b>Communication Electronics</b></p>	<p>Understanding AM and FM (Transmission and reception): Modulation, AM generation, Power consideration, Balanced modulator, SSB transmission, AM detection, AGC, Radio receiver characteristics, signal to noise ratio, FM analysis, noise considerations, generation, direct method and reactance tube method, FM transmitter, AFC, FM Propagation, phase discriminator.</p> <p>To know the propagation of radio waves, Antenna and TV.</p> <p>Study of transmission lines, Voltage and current relations on transmission line, propagation constant, characteristic impedance, impedance matching, quarter wave T/L as impedance transformer, attenuation</p> <p>along coaxial cable, cables of low attenuation, propagation of radio waves between two parallel lines, wave guide modes, TE<sub>10</sub> mode and cut off wavelength, cavity resonator, light propagation in cylindrical wave guide, step index and graded index fibers, attenuation and dispersion in fibers.</p>
<p><b>Plasma Physics</b></p>	<p>Introduction to Plasma, Elementary concept: Derivation of moment Equation from Boltzmann Equation, Plasma Oscillation, Debye Shielding, Plasma parameter, Magneto plasma, Plasma confinement.</p> <p>Understanding MagnetoHydrodynamics and magneto Plasma</p> <p>To study plasma propagation and fluid plasma, Propagation at finite angle and CMA diagram, Propagation through ionosphere and magnetosphere, Helicon, Faraday rotation, Fluid equations for a plasma, Continuity equation, Momentum balance equation, Equations of state, Two-fluid equations, Plasma resistivity.</p>

<p><b>Digital Electronics and Computer Architecture</b></p>	<p>Learning elementary idea of combinational and sequential circuits, Overview of Microcomputer organization and operation, Microprocessor evolution and types, Fundamental knowledge of Microprocessor (8085/8086), Architecture and its operation, Basic idea of logic devices for interfacing 8085/8086.</p> <p>Understanding Computer Organization and Architecture</p> <p>Understanding data communication, Computer and Communications, Need for communication networks, Internet and World Wide Web, communication protocols, Local Area Networks, Interconnecting networks, Future of Network Technology.</p> <p>To study Characteristics of communication channels, Allocation of Channels, Physical Communication media, Public Switched Telephone Network, Cellular Communication Path, ATM networks.</p>
<p><b>Atmospheric Physics</b></p>	<p>To gain knowledge about Earth atmosphere, Elementary concept of atmospheric sciences, atmosphere and its composition, Thermal and pressure variation in earth atmosphere, Thermal structure of the troposphere, stratosphere, mesosphere and ionosphere, Hydrostatic equation, spectral distribution of the solar radiation, Green house effect and effective temperature of earth. Meteorological process and different system, local winds, monsoons, fogs, clouds, precipitation, Cyclones and anti-cyclones, thunderstorms, Mountain Meteorology.</p> <p>Understanding Atmospheric Dynamics and Thermodynamics, Environmental pollution and climate change</p> <p>Study of Convective measurements of pressure, temperature, humidity, wind speed and direction, sunshine duration, radiation clouds, upper air pressure, temperature, humidity and wind measurements, Polit balloons, radiosonde, dropsonde, ozonesonde, GPS sonde. Application</p>

	<p>of radars to study the atmospheric phenomenon, LIDAR, SONAR, RASS</p> <p>(Radio- acoustic sounding system), Observational technique for aerosol.</p>
<p><b>Introduction to Nanoscience and Nanotechnology</b></p>	<p>Understanding Emergence of Nanotechnology – Challenges in Nanotechnology, Carbon age–New form</p> <p>of carbon (From Graphene sheet to CNT), Introduction to nanomaterials, evolution of nanoscience, general properties of nanomaterials, role of size in nanomaterials, semiconducting nanoparticles, nanoclusters, quantum wells, conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state. Synthesis of nano structured materials, sol-gel processing, Mechanical alloying and mechanical milling, Inert gas condensation technique, Nanopolymers, Bulk and nano composite materials, top down and bottom up approaches.</p> <p>Study of properties of nanomaterials and characterization techniques.</p> <p>Learning about the applications of nanomaterial to Molecular electronics and nanoelectronics, Quantum electronic devices, Carbon Nano Tube</p> <p>based transistor and Field Emission Display, Biological applications, Biochemical sensor, medical applications and Membrane based water purification. Biological systems- DNA and RNA - Lipids.</p>
<p><b>Self study Courses</b></p>	
<p><b>Advances in High Energy Physics</b></p>	<p>Understanding Gauge Theory and Unification of Fundamentals Forces, Quantum Chromodynamics, Thermal Field Theory and Beyond Standard Model</p>

<p><b>Advances in Laser Physics</b></p>	<p>Understanding Laser Raman Spectroscopy and Laser Spectroscopy in Molecular Beams.</p> <p>To gain knowledge of Modern Laser Spectroscopy.</p>
<p><b>Advances in Solar Physics</b></p>	<p>Learning about Solar Flares: Magnetohydrodynamic Processes, Solar Cycle: Observations and theory, Sun-Earth Connection.</p>
<p><b>Bio-Physics</b></p>	<p>To Know the Basic Concepts of Bio-Physics</p> <p>Understanding Technique For The Study of Biological Structure and Function</p> <p>To study the Radiation Effects on Biological Systems</p>
<p><b>Computer Application in Physics</b></p>	<p>Understanding the role of Computers in Physics, Formulation of a problem for solution on a computer, paradigm for solving physics problems for solution . Algorithms and Flowcharts</p> <p>Learning Scientific Programming (FORTRAN and C language), Scientific Word Processing and Modern Software's For Mathematical Computing (LaTeX and MatLab).</p> <p>Study of Computer Applications to Physical Problems(Numerical Methods and Monte Carlo methods).</p>
<p><b>Medical Physics</b></p>	<p>To know about the mechanics of human body, Physics of Respiratory and Cardiovascular System.</p> <p>Understanding Electricity in the Body and Sound/Light In Medicine and Diagnostic X-Rays and Nuclear Medicine.</p> <p>To gain knowledge about Medical Precision Equipments and Modern Medicines (MRI, PET, CT scan, ventilators, description, working, analysis and clinical applications of Ultrasonic imaging, ECG, EMG, EEG and ERG. Nanotechnology-based drugs e.g. Abraxane, Doxil, C-</p>

	dots (Cornell dots) and goldnano particle as a diagnostic tool, Anti-cancer polymeric nanomedicines, Use of nano-technology in Photodynamic therapy.
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# DEPARTMENT OF POLITICAL SCIENCE

## H.N.B. G.P.G. COLLEGE KHATIMA

### BACHOLER OF ARTS

<b>B.A. I Year</b>	Paper I – Principles of Political Science	The students will get basic knowledge of Political Science and various ideologies of political thinkers.
	Paper-II- Theories of Modern Government	Students will be able to get knowledge of Major Political systems and constitutions of various special countries
<b>B. A. II Year</b>	Paper I – Political thought	The Student will be able to understand various Political thoughts of some kind of world special and famous ancient Political thinkers.
	Paper II- Indian Government and Politics	The student will get basic knowledge of their fundamental rights, duties, and the Indian constitution.
<b>B. A. III Year</b>	Paper I – International Relations	The students can acquire knowledge of various countries' policies and the basic diplomatic rules and relations between each other countries.
	Paper-II Elements of Public Administration	Students will get basic knowledge of the organization and its important role in the budget, requirement, promotion, punishment, motivation, training, and also Lokpal and Lokayukta.

## MA. 1<sup>ST</sup> SEM.

<b>PAPER I</b>	Western Political thought (from Plato to Bodin)	Students will able to get knowledge about the ideology of famous ancient and medieval western political thinkers.
<b>PAPER II</b>	Comparative Politics	By studying this paper students can get knowledge of comparative elements of democracy such as political system, approach, structural functional approach, political culture, socialization, development, modernization, pressure group, electoral system and public opinion etc.
<b>PAPER III</b>	Public Administration	Student will get basic knowledge and difference of public and private administration.
<b>PAPER IV</b>	Indian Political system	Basic knowledge of Indian political system and basics of Indian constitution.
<b>PAPER V</b>	International Politics	The students can acquire the knowledge of various country's policies and the basic diplomatic rules and relations between each other country's.

## MA. 2<sup>ND</sup> SEM.

<b>PAPER I</b>	<b>Political thought (from Hobbes to Marx)</b>	Students will able to get knowledge about the ideology of famous modern political thinkers.
<b>PAPER II</b>	<b>Indian Administration</b>	Student will get basic knowledge and difference of public and private administration with reference to India.
<b>PAPER III</b>	<b>State politics in India with special reference to Uttarakhand</b>	Students can get the knowledge of state politics in the context of Uttarakhand.
<b>PAPER IV</b>	<b>Indian Political Dynamics</b>	Students can get the knowledge of main factors of Indian politics such as caste, communism, secularism, regionalism, gender, corruption etc.
<b>PAPER V</b>	<b>Dissertation</b>	Students can get the knowledge of basics of research.

### M.A. 3<sup>rd</sup> SEM.

<b>PAPER I</b>	<b>Indian Political thought</b>	Students can get the ideology of Indian political thinkers.
<b>PAPER II</b>	<b>Political Ideology</b>	This paper helps the students to understand the knowledge of the world's famous ideologies.
<b>PAPER III</b>	<b>Political thought (from Lenin to Rawls)</b>	The Student will be able to get the knowledge of the ideology of famous communist thinkers.
<b>PAPER IV</b>	<b>Gandhian Discourse in Politics</b>	The Student will get knowledge of the main elements of Gandhian ideologies.
<b>PAPER V</b>	<b>Human Rights / Local self Government/ India in World Affairs</b>	The Students will learn to take an overview on Human Rights, Local self Government and India in World Affairs

### M.A. 4<sup>th</sup> SEM.

<b>PAPER I</b>	<b>Contemporary Political Philosophy</b>	The students will be able to understand contemporary political ideologies.
<b>PAPER-II</b>	<b>Environmentalism</b>	The Student will get the knowledge of environmentalism from political angle.
<b>PAPER III</b>	<b>Post-Cold War International Relations</b>	Students can get the knowledge of the new world order and issues after the post-cold war international relations.
<b>PAPER IV</b>	<b>International Organization</b>	Students can get the knowledge of emerging history and objectives of international military and non-military organization.
<b>PAPER V</b>	<b>Research Methodology/Ethics and Politics</b>	Students can get the basic knowledge of keen factors related with research methods.
<b>PAPER VI</b>	<b>Viva- Voce</b>	To improve the personality development for future prospective.



# DEPARTMENT OF ENGLISH

## PROGRAMME OUTCOME

The main programme outcomes of M. A. in English are:

- Students shall be able to read, interpret, understand and write about a diverse range of texts in English analytically and critically
- Students shall be able to analyze texts of a variety of literary genres in terms of style, figurative language and convention.
- Students shall be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
- Students shall be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students shall be able to ethically gather, understand, evaluate and synthesize information from a variety of written and web sources.
- Students shall be able to understand the growth of literature in India in English translation from classical to modern times.
- 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.
- Students shall be educated in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture.
- 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.
- Students shall become good human beings as the course shall teach them the true

philosophy of life.

## **DEPARTMENT OF CHEMISTRY**

Program specification outcome and Course Outcome are assessed by focusing on the outcome of internal as well as external examination. The marks obtained by the students in the semester/year examination, assignments, practical examination, etc. are reflective/ indicative of Programme/ Course outcomes. This offers information about the achievements of the students to the respective course teachers. Besides this, each department organizes Presentations, Quizzes, Chart/ Poster competitions to motivate the students to exert a little bit of extra effort for improving their performance. The POS is evaluated by the number of students getting selected in various institutions for higher or specialization studies and getting placement after the course.

### **Graduation:**

**Program outcome:** The U.G. program provides the understanding of fundamental chemistry from core to their basic application in daily life. At the end of this program student have acquired the knowledge of chemistry of system, surrounding and their positive and negative impact in our daily life and environment.

**Course outcome:** The students will be able to know

**Inorganic chemistry:** This course includes the fundamental study of atomic structure, periodic properties, Nature of chemical bonding, related theories and chemistry of all the elements of periodic table. Metallurgical processes, chemistry of transition elements, oxidation and reduction, coordination chemistry, hard and soft acid-base theory, metal-ligand bonding in transition metal complexes, magnetic properties of transition metal complexes, electronic spectra of transition metal complexes, thermodynamic and kinetic aspects of coordination compounds, organometallic chemistry, bioinorganic chemistry, inorganic polymers of silicon and phosphorus.

**Organic chemistry:-**this course gives the understanding of structure and bonding, mechanism of organic reactions, stereochemistry of organic compounds and the study of different functional groups in organic molecules. Study of electromagnetic spectrum; absorption spectroscopy, spectroscopy, organo-metallic compounds, organo-sulphur compounds, heterocyclic compounds. Also it involves the study of biomolecular like carbohydrates, amino acids, peptides, proteins and nucleic acids which constitutes of body and monitor the functioning of life. Study of fats, oils and detergents, synthetic polymers, synthetic dyes, natural products.

**Physical Chemistry:-**This course links physical state with the chemical changes occurs in our surroundings and nature. The chemistry of different states i.e. Solid, liquid and gaseous state and colloidal state and branch of science that deals with the quantitative relationship between heat and other forms of energy called thermodynamics and the chemistry related to electrolytes called electrochemistry. Study of Elementary Quantum Mechanics, Spectroscopy, Photochemistry, Physical Properties and Molecular Structure, Solutions and Colligative Properties, Thermodynamics.

## **POST-GRADUATION**

**Program outcome:** The P.G program offer the understanding of detail, advanced and fine

knowledge of chemistry. This program explores and covers the remaining concept of U.G program and links the text book chemistry to the daily life activities and their application. Importantly this program includes the course that deals with the study of interaction of light with matter called spectroscopy which helps in the real analysis.

## **COURSE OUTCOME:**

### **INORGANIC CHEMISTRY**

This Course encompasses the theories and bonding concepts in coordination compound and acids-bases in detail. The interesting chemistry of organometallic compounds.

The students will be able to know

1. The chemistry of main group elements, synthesis and properties of few main group compounds.
2. General properties and separation of lanthanides and actinides.
3. Basics of nuclear chemistry and radio analytical techniques.
4. Stability of organometallic compounds and clusters, and their applications as industrial catalysts.
5. Explain the formation, reaction mechanism and stability of coordination complexes.
6. Interpret the electronic and magnetic properties of inorganic compounds.

### **ORGANIC CHEMISTRY**

This advance organic chemistry course includes the mechanism, energy consideration, stereochemistry and different types of organic reactions in detail.

The students will be able to explain

1. Mechanistic aspects in nucleophilic and electrophilic substitution.
2. Reaction conditions, products formation and mechanisms of some named reactions.
3. Mechanisms of addition reactions of C=C and C=O bonds and elimination reactions.
4. Assess chromatographic separation and identification of organic compounds.
5. Distinguish purification, crystallization, and different distillation processes.
6. Recognize synthesis, purification and characterization of aspirin, Schiff's base, Diels-

Alder adduct.

## **PHYSICAL CHEMISTRY**

This course includes the thermodynamic and kinetic behaviour of reaction and various theories for reaction kinetics. The students will be able to:

1. Comprehend the redox processes in electrochemical systems.
2. Explain Debye-Huckel theory and determination of activity and activity coefficient.
3. Correlate and differentiate Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics, theories of specific heat for solids.
4. Interpret mechanism for chemical reactions for optimizing the experimental conditions.
5. Familiar with application of homogeneous and heterogeneous catalysis in chemical synthesis.
6. Explain the importance of adsorption process and catalytic activity at the solid surfaces.
7. Classify the colloidal material and their stability for many practical uses.

**GROUP THEORY AND INSTRUMENTATION CHEMISTRY:** Group Theory is the mathematical application to determine the symmetry of molecule and molecular operation and to obtain knowledge of its physical properties and binding nature. Instrumentation techniques involve the understanding about the instruments and techniques used in analysis.

The students will be able to explain

1. The concepts of symmetry and group theory in solving chemical structural problems.
2. Molecular structure by the use of character tables and projection operator techniques.
3. The importance of symmetry and group theory in spectroscopic applications.

**Spectroscopic Techniques:** This course deals with the study of interaction of light with matter. The light of different energy cause different type of changes like electronic, vibration, rotational, nuclear etc. interaction with different frequency light in molecule. Organic spectroscopy includes NMR, ESR, Mossbauer, IR, UV-visible spectroscopy.

The students will be able to

1. Identify functional groups using IR,  $\lambda_{\max}$  for polyenes and  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds.

2. Interpret Cotton effect curves for obtaining absolute configuration of chiral molecules with chromophores.
  3. Determine chemical structure by UV-Vis, IR, <sup>1</sup>HNMR, <sup>13</sup>CNMR and mass spectral data.
  4. Interpret microwave, vibration-rotation Raman and infra-red spectra for chemical analysis
  5. Analyze electronic spectra of different elements and simple molecules.
4. Comprehend Nuclear Magnetic and Electron Spin Resonance spectroscopic techniques for organic compounds analysis and medical diagnostics.

**Solid State Chemistry:** The students will be able to

1. Correlate the physicochemical properties, defects in solid, diffraction techniques, electrical and magnetic properties of materials.

**Chemistry for Biological System:** The students will be able to

1. Assess molecular structure and interactions present in proteins, nucleic acids, carbohydrates and lipids.
  2. Be familiar with organization and working principles of various components present in living cell.
  3. Evaluate kinetics, thermodynamics, and mechanism of protein folding.
1. Assess the structure and biological functions of proteins and the role of metals in biology.

**Inter Disciplinary Topics in Chemistry:** The students will be able to

1. Comprehend experimental techniques for different catalytic reactions.
2. Interpret physical and chemical characterization of catalysts and catalytic reaction.
3. Be familiar with various reagents and their applications in industry.
4. Various optical methods like AES, AAS, plasma and electric discharge spectroscopy, spectrofluorimetry, nephelometry and turbidimetry.
5. Potentiometric, coulometric, and voltametric methods of analysis.
6. Chromatographic techniques and applications.

**Photo Chemistry and Allied Chemistry:** Various reactions takes place by the effect of

temperature change called thermal reaction. The reactions which takes place by the effect of light of different frequency and wavelength is called photochemical reaction and mechanism of such reactions studied under photochemistry.

The student will be able to

1. Conformational analysis of cycloalkanes, reactivity, chirality, interconversion, resolution and asymmetric synthesis.
2. Aromaticity, nonaromaticity and antiaromaticity in carbocyclic and heterocyclic compounds.
3. Molecular orbital symmetry and possibility of thermally and photochemically pericyclic reactions.
4. Basics of photochemical reactions of alkenes, carbonyl and aromatic compounds.
5. Assess photochemistry and photophysical principles.
6. Identify and characterize of transient intermediates by ultrafast modern techniques.
7. know the theory and application of photochemistry and photophysical principles of macromolecules.

**organic Synthesis:** The synthesis of organic molecules involve various approached and mechanism, new molecules synthesized by mimicking the existing route amd concept. Retrosynthetic or disconnection approach also used to design various drug molecule and biologically active molecule.

The students will be able to interpret

1. Mechanistic pathway of organic reactions.
2. Retro-synthetic approach to planning organic syntheses.
3. Conversion of different functional group *via* rearrangement reaction.

**Medicinal Chemistry:** The students will be able to

1. Comprehend drug designing and development, their SAR and QSAR.
2. Explain the mode of action of different drugs.
3. Describe the role of drugs to inhibit the particular enzymes and treatment of disease.

**Program Specific Outcomes:**

Chemistry is a broad area, its important branch of science as everything we do is chemistry! All matter is made up of chemical, even our body is made of chemicals and chemical reaction occur when we eat, breath etc, so it's the study of everything. From starting (like extraction of elements, compounds) to their final state (like polymers, cosmetics, drugs and medicine etc.) Ready for application involve various chemical processes and purification techniques which were studied under the program. The advantage of leaning chemistry and acquiring knowledge about the process and techniques involves have great career opportunities in academic as well as industries. As this subject covers broad area, one can pursue a job as a pharmacologist, biochemist, lab technicians, analytical chemist, environmentalist, synthetic chemist, material scientist, geochemist, chemical engineer in industry.



# DEPARTMENT OF PHYSICS

## HNB PG COLLEGE KHATIMA

**PROGRAM OUTCOMES (POS):** The Physics department offers two programs:

1. Physics for B.Sc. students of PCM.
2. M.Sc. Physics.

Both these programs are primarily geared towards cultivating the idea – “*Physics is the study of nature and its laws (till the most fundamental level)*”, amongst the students. The Program Specific Outcomes (PSOs) and the Course Outcomes (COs) of the individual programs/courses/papers are more or less spun around this theme and are listed below.

**Program Specific Outcomes (PSOs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM)

**PSO1:** Understanding the fundamental concepts of Physics and its basic laws.

**PSO2:** Acquire the necessary mathematical tools and concepts required for understanding the underlying physics.

**PSO3:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical).

**PSO4:** Acquire problem solving skills and ability to apply them to real world physical phenomenon.

**PSO5:** Motivation to pursue higher studies (Postgraduate, Research etc.) in Physics.

**Course Outcomes (COs):** For the Under-Graduate Physics program (B.Sc. Physics for PCM).

<b>Mechanics and Theory of Waves and Oscillations</b>	Understanding vector analysis (applying concepts for problem solving), the nabla operator (Gradient, Divergence & Curl), Differentiation and Integration of Vectors (fields), Integral Theorems (Gauss, Stokes, Green and corollaries).  Understanding - Frame(s) of Reference, Newton's Laws (along with application for point particles as well as system of particle), (conservative) force and potential energy, Work-Energy Theorem, Rocket motion.
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Understanding quantities and ideas related to rotational motion- Angular Velocity, Angular momentum, Torque, Moment of Inertia (calculations and related theorems), Conservation of Angular Momentum.

Understanding Newton's law of gravitation, Gravitational Field, Potential & Potential Energy, Central force, Kepler's Laws of Planetary motion, Satellite and Planetary orbits and motions.

Understanding material properties such as elasticity, stress, strain, various elastic constants and their relationships, Experimental methods to determine the various elastic properties.

Understanding fluids at rest (surface tension, excess pressure) as well as in motion (viscosity, flow through capillary tube, Bernoulli's theorem, Poiseuille's formula), Experimental methods to determine surface tension and viscosity.

Understanding Simple Harmonic Motion, the Harmonic Oscillator Equation and solutions, Linearity and Superposition principle, Superposition of Harmonic Oscillations- Collinear(Interference & Beats) and Perpendicular (Lissajous Figures).

Understanding waves and wave motion, Waves on a string (travelling and standing), Normal-modes, Group and Phase velocities. Understanding the Fourier Theorem and its applications.

Understanding Damped Harmonic Oscillations, Over/Under/Critical damping, Relaxation time, LCR circuit.

Understanding Forced Harmonic Oscillations, Transient and Steady state behavior, Resonance and Sharpness, Bandwidth, Quality Factor.

Understanding intensity and loudness of sound waves, Decibels, Ultrasonic waves (generation, detection and uses), Building acoustics, Reverberation time and Sabine's formula, (Acoustic) design of buildings.

<p><b>Electricity and Magnetism</b></p>	<p>Understand the basic concepts of Electrostatics-Field, Flux, Gauss's Theorem with applications, Potential and relation with Field, Potential Energy. Also concept of conductors, dielectrics and capacitance, The Electric-Vector.</p> <p>Understand the basic concepts of Magnetostatics- Biot-Savart's Law and applicatons, The Lorentz Force law, Div and Curl of magnetic field and the magnetic vector potential, Ampere's circuital law, Magnetism in matter (Magnetization, Permeability, Susceptibility) and Types of Magnetic materials (Dia, Para &amp; Ferro). Understanding inductance (self and mutual and induction), Faraday's Law, Lenz' Law &amp; energy conservation, AC circuits- RC, LC and LCR, Resonance.</p> <p>Realizing that EM is contained in the 4 Maxwell's Equations, Understanding equation of continuity, displacement current, Maxwell's correction to Ampere's circuital law. Gain knowledge on EM waves, propagation and their properties using Maxwell's equations, Polarization of EM Waves.</p>
<p><b>Practical (B.Sc. !st Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 1 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Momentof Inertia, Elastic constants, Simple &amp; Compound pendulums, Current, Voltage, Resistances, Solenoid, LCR circuit, SHM, Normal modes of a string etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>
<p><b>Heat Thermo dynamics &amp; Statistical Physics</b></p>	<p>Understanding the basic thermodynamic concepts- State variable, Equilibrium, Heat, Work, Zeroth and First Laws and the concepts of Temperature and Internal Energy, Applications of First Law to various processes (Adiabatic, Isothermal etc.), Mayer's relation.</p> <p>Understanding the need of second law of thermodynamics, Reversible &amp; Irreversible processes, Heat Engine and Refrigerator, Second Law of Thermodynamics (in term of Engines and refrigerators), concept of entropy, the Carnot cycle, second law in terms of entropy change, the Nernst theorem.</p>

Understanding the four thermodynamic potentials, The Maxwell's relations and applications (response functions, Joule-Thompson cooling, Calusius-Clapeyron equation etc.)

Understanding the Kinetic Theory of Gases (towards a microscopic description), Maxwell's velocity distribution law, transport phenomenon, the classical equipartition theorem and its use to determine specific heats of mono-atomic and diatomic gases.

Understanding Blackbody radiation (the first step towards quantum mechanics), Spectral emissive power, Energy Density of Cavity Radiation, The Rayleigh-Jeans Law, Planck's law and deducing Wien's displacement law, Wien's distribution laws (1<sup>st</sup> and 2<sup>nd</sup>), Stefan-Boltzmann law and Rayleigh-Jeans from it.

Understanding Basic postulates of Statistical Physics, Macro and Micro States, Phase Space, Density distribution in phase space,  $\mu$  space representation and its division, Statistical average values, Condition of equilibrium, Stirling's Approximation, Entropy and Thermodynamic probability, Boltzmann entropy relation. Ensembles, Micro -canonical, Canonical and Grand Canonical ensembles, Statistical definition of temperature and interpretation of second law of thermodynamic, Pressure, Entropy and Chemical potential. Entropy of mixing and Gibb's paradox, Partition function and Physical significances of various statistical quantities.

Understanding Maxwell-Boltzmann statistics and Distribution law, Energy distribution function, MaxwellBoltzmann law of velocity distribution (most probable velocity, average velocity, RMS velocity), Limitations of M-B statistics, Elementary idea of quantum statistics.

<p style="text-align: center;"><b>optics</b></p>	<p>Understanding Geometrical Optics- Fermat's principle of extremum path and applications, Cardinal points, Combination of Lenses, Lagrange equation of magnification.</p> <p>Understanding optical instruments- Eye pieces (Ramsden's, Huygen's and Gaussian), Aberrations (and types) and their corrections.</p> <p>Understanding the Interference of Light- The superposition principle, Coherence and conditions for interference, Double slit interference, Division of amplitude and division of wavefront, Fresnel's Biprism, Phase change upon reflection, Thin-film interference (Haidenger and Fizeau fringes), Newton's rings (theory and experimental setup), The Michelson Interferometer and its (experimental) use, Fabry-Perot interferometer.</p> <p>Understanding diffraction of light- Fresnel diffraction, Half-period zones and zone-plate, Diffraction pattern of edge, slit and wire, Fraunhofer diffraction (single, double and multiple slits), The diffraction grating as a measurement tool.</p> <p>Understanding polarization of light- Transverse EM Wave, Plane polarized light (production and analysis), Malus Law, Brewster's Law, The Nicol Prism, Circularly and Elliptically polarized light, Optical rotation, The polarimeter (experimental setup also).</p>
<p style="text-align: center;"><b>Practical (B.Sc. 2<sup>nd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 2 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about thermal conductivity, blackbody radiation, calorimetry, statistical probabilities, dispersion, interference, gratings, lens combinations, polarization etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

**Modern  
Physics**

Understanding the origins of quantum theory- Blackbody radiation and early radiation laws, Planck's (revolutionary) idea (the quantum hypothesis & birth of quantum mechanics), Photoelectric and Compton effects. waves and their wavelength, Davisson-Germer Experiment, Wave-particle duality, The uncertainty principle (position-momentum and Energy-time), Interference experiments with particles.

Understanding the Schrodinger's equation (quantum mechanical equation of motion), Time dependent and time-independent versions, Framework of QM (postulates, wavefunction- properties and physical significance), Probability and Conservation, Operators, Eigenfunctions and Eigenvalues, Expectation values, The free particle wavefunction.

Learning to solve the Schrodinger's equation, Stationary states, Boundary conditions lead to quantization, Potential Step & Barrier and transmission, Potential well (infinite and finite depths), The one dimensional harmonic oscillator in QM, Zero point energy.

Learning to solve the Schrodinger's equation in three dimensions (for spherically symmetric systems), The Schrodinger's equation for the Hydrogen atom and solving it using separation of variables, Angular momentum eigenfunctions (spherical harmonics), Solving the radial equation using Frobenius's method, Emergence of the various quantum numbers (n, l and m).

Understanding the various atomic models- Thomson, Rutherford and Bohr, the Bohr model and the hydrogen spectra, Other quantum ideas/experiments- Bohr-Sommerfeld model and quantization condition, the Stern-Gerlach experiment and electron spin, Electron magnetic moment, Bohr magneton, Larmor's precession, The vector atom model, Space quantization.

Understanding optical spectra (on the basis of the vector atom model), LS and JJ couplings, Selection and Intensity Rules, The fine structure of sodium D lines, Magnetic interactions and Zeeman effect, X-ray spectra and

	<p>Moseley's Law.</p> <p>Understanding basics of radiation, Absorption and Emission (spontaneous and stimulated), The Einstein's A and B coefficients, Metastable states (long living), Population inversion, Pumping, Lasing action and Laser/Maser.</p> <p>Understanding Franck-Condon Principle, Molecular spectra, Rotational, Vibration and Electronic spectra of diatomic molecules, General features of electronic spectra, Luminescence, Basics of Raman effect.</p> <p>Understanding the atomic nucleus, Constituents of the nucleus, properties, Nature of nuclear force, Binding Energy and BE curve, Stable nuclei, The semi-empirical mass formula, Models of the nucleus (Liquid drop and Shell model), elementary particles and their classification schemes.</p>
<p><b>Electronics</b></p>	<p>Understanding Kirchhoff's Laws, Superposition Theorem, Constant voltage source and constant current source, Conversion of voltage source into current source, Thevenin's Theorem and procedure for finding thevenin equivalent circuit, Norton's Theorem and procedure for finding Norton equivalent circuit, Maximum power transfer theorem, Applications of Network Theorems, Four terminal Network and h-parameters.</p> <p>Understanding elementary semiconductors and devices (intrinsic, extrinsic-P &amp; N), the PN diode and its characteristics in forward and reverse bias, Zener diode, Optoelectric devices- LEDs, Photodiode and Solar cell.</p> <p>Understanding diode circuits- The rectifier- Half-wave, Full-wave (Centre tapped and Bridge versions), Ripple factor and Efficiency, Filters (C, L, Pi etc.), Clipping and Clamping circuits using diodes, Voltage multipliers, Zener diode and voltage regulation.</p> <p>Understanding transistors and amplifiers- Bipolar Junction transistors (NPN, PNP), Characteristics (input and output) in various configurations (CE, CB &amp; CC), Current gains alpha and beta and their relation, Load line analysis, Q-point, Active, Cutoff and Saturation regions, Transistor biasings; Transistor Amplifiers- Voltage, Current and Power, Class A, B and C amplifiers; The Field Effect Transistor (FET) and the Uni-Junction</p>

	<p>Transistor (UJT)</p> <p>Understanding Oscillator circuits- Feedback (negative and positive), Birkhausen's criterion, RC (Wein bridge and Phase-Shift) &amp; LC (Collector tuned and Colpitt) oscillators and frequency of oscillation, Crystal oscillators, The Multivibrator and various operation modes (Monostable, Astable and Bistable).</p> <p>Understanding Digital Electronics and Circuits- Number systems (Binary etc.) and conversions, Basic Logic Gates (AND, OR &amp; NOT) and realizations using diodes and transistors, Universal Gates (NAND &amp; NOR), Other gates, Boolean Algebra- De Morgan's Theorem, Simplifying logic circuits, Minterm, Maxterm, SOP and POS, Karnaugh Map, Binary arithmetic (addition, subtraction) using</p> <p>circuits- Half/Full adders, Word (4-bit) binary adder-subtractor</p>
<p><b>Practical</b> <b>(B.Sc. 3<sup>rd</sup> Year)</b></p>	<p>The various practicals included in the Physics syllabus of B.Sc. 3 are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers (e.g. ideas about Energy quanta, quantization, diodes, LEDs, rectifiers, power supplies, transistors, amplifiers, oscillators, logic gates, Boolean algebra, logic circuits etc). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to connect theory with experiments.</p>

### **PROGRAM SPECIFIC OUTCOMES (PSOs): FOR M.SC. PHYSICS**

**PSO 01:** Strengthening and further understanding of the fundamental concepts of Physics and its basic laws (as acquired during the Under-graduate studies) by augmenting mathematical rigor (at the Physicists level) along with Physical interpretations (and clear physical picture(s)) of any theory/process/situation.

**PSO 02:** Acquire the necessary mathematical-tools (analytic, approximate, numerical, graphical etc.) and concepts required for understanding the underlying physics and use them to solve complex and advanced problems (including those with real world



applications).

**PSO 03:** Gain substantial knowledge in the various (core) branches of Physics- viz. Classical Mechanics, Electrodynamics, Mathematical Methods, Quantum Mechanics, Statistical Mechanics, Condensed Matter Physics, Astrophysics, Electronics, Nuclear Physics, Particle Physics etc.

**PSO 04:** Acquire theoretical and experimental knowledge/skill related to the physical phenomenon, as well as the ability to connect both (theory & practical). Also gradually develop the scientific method by designing and conducting experiments.

**PSO 05:** To get an exposure to research and research methodology during the dissertation work (theoretical and/or experimental) to be performed during the last semester.

**PSO 06:** Motivation to pursue a research/academic career in Physics. Aim towards writing and qualifying in various competitive exams- (e.g. CSIR-UGC-NET, GATE, JEST, BARC, DRDO, Entrance exams of premier research institutes (National & International)).

**PSO 07:** Gain knowledge of the subject along with general competence and analytical skill for employment in other sectors viz. industry, R&D, consultancy, public administration etc.

### **COURSE OUTCOMES (COS): FOR M.SC. PHYSICS**

<b>Mathematical Physics</b>	To learn series solution of differential equations, Legendre, Bessel, Hermite, and Laguerre differential equation and related polynomial, physical integral form of polynomials and their orthogonality relations. Generating Function and recurrence relation.  Understanding curvilinear Coordinates and various operators in circular, cylindrical and spherical coordinate systems, classification of Tensors, Rank of a Tensor, covariant and contra-variant tensors, symmetric and anti-symmetric Tensors, Kronecker delta symbol. Contraction of
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	<p>Tensor, metric Tensor and Tensor densities, covariant differentiation and Geodesic equation.</p> <p>Understanding function of complex variable, Cauchy's Riemann differential equation, Cauchy's integral theorem, residues and Cauchy's residues theorem, singularities, evolution of residues and definite integral.</p> <p>Understanding Fourier integral and Fourier Transform, Fourier integral theorem, finite and infinite integral, Laplace transform of elementary function (Dirac delta &amp; Green's function), Solution of simple differential equations.</p>
<p><b>Classical Mechanics</b></p>	<p>Understanding mechanics of a system of particles (Constraints and generalized coordinates, D'Alembert's principle, Lagrange equations for holonomic and non holonomic systems and their applications, conservation laws of linear momentum, energy and angular momentum.</p> <p>Understanding Lagrangian and Hamiltonian Formulations with their applications to various conservative systems, Hamilton Jacobi theory.</p> <p>Understanding Dynamics of rigid bodies including Motion of a rigid body, body and space Reference system, angular momentum and Inertia tensor, Principle axes- Principle moments of Inertia, spinning tops, Euler angles, Infinitesimal rotations.</p> <p>Understanding Central force problem including Action and angle variables, phase integral, small oscillations, Kepler's laws of Planetary motion and their deduction, scattering in a Central field, Rutherford scattering cross section.</p>
<p><b>Quantum mechanics</b></p>	<p>Understanding that our world is inherently quantum and so the proper framework to understand it is Quantum Mechanics.</p> <p>"Establishing"/Understanding the basic framework of QM</p>

	<p>(Schrodinger's equation, wavefunction and probabilistic interpretation, uncertainty relations etc.).</p> <p>Learning to solve the Schrodinger's (time-independent) equation (various one and three dimensional problems).</p> <p>Understanding the various formulations of QM and their equivalence- Schrodinger, Heisenberg (Matrix) and Dirac formulations.</p> <p>Understanding symmetry in QM- Space and Time translation symmetries as well as Rotational symmetry (Angular momentum, Spin, Addition etc.)</p> <p>Understanding the various approximation methods to solve the Schrodinger's equation (Perturbation, Variational method, WKB approximation) and application to different (stationary) state problems.</p> <p>Applying approximation methods to time dependent problems and treatment of radiation (emission and absorption) via such methods (Time dependent perturbation theory, Fermi's Golden Rule, the Semiclassical theory of radiation etc.).</p>
<p><b>Statistical Mechanics</b></p>	<p>Understanding the (average) microscopic description vs. the macroscopic description (as done in Thermodynamics) for a system with large no. of degrees of freedom.</p> <p>Understanding (and calculating within the framework) the various statistical ensembles and the corresponding (thermodynamic) formulations.</p> <p>Application of the statistical ideas to derive/understand the behavior of gases (ideal as well as real).</p> <p>Understanding the basics of Quantum SM (FD &amp; BE stat) and some simple applications.</p> <p>Understanding blackbody radiation as a gas of photons (i.e statistical treatment- BE statistics).</p>
<p><b>Atomic &amp; Molecular Physics</b></p>	<p>Understanding that optical properties of materials and realizing the fact that it are just an application of Quantum Mechanics to</p>

	<p>atomic/molecular systems.</p> <p>Understanding the atomic and molecular spectra along with their finer features (Fine structure, Vibrational-Rotational spectra).</p> <p>Understanding the effect of electric and magnetic fields on the various spectra via interactions (or charge and/or spin).</p> <p>Understanding the various theories/formulations/models to understand spectra (Vector atom model, LS, JJ coupling schemes, Raman spectroscopy, Heitler-London and Born-Oppenheimer treatments etc.)</p> <p>Understanding the quantum theory of radiation (Einstein's coefficients) and basic working principle of Lasers.</p>
<p><b>Practical (Sem1)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 1<sup>st</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. CRO, SCR, Transistors, Diodes, FET, Amplifiers, Oscillators, Antennas, Amplitude modulation/demodulation etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>General relativity and cosmology</b></p>	<p>Understanding the foundations of general relativity including Elements of Special relativity, Tensors as geometrical objects, Mach's Principle, non-inertial frames of reference, Gravity and space-time, Principle of equivalence and principle of general covariance, Metric tensor and gravity, Geodesics and Affine parameters (Christoffel symbols), covariant derivative and its geometrical interpretation, parallel transport, spacetime curvature and curvature tensor, Riemann curvature tensor, Bianchi identity, Ricci tensor, classification of space-time curvature (in different dimensions).</p>

	<p>Understanding Christoffels connection as Einstein's connection, Gravitational action, field equations and their general properties, Newtonian limit of Einstein's field equations, Metric in spherically symmetric space-time (Schwarzschild metric), Orbits in the Schwarzschild metric, gravitational collapse of a dust sphere, Schwarzschild black holes.</p> <p>Introduction of Gravitational radiation, Wave equation in linearized theory and plane waves, propagating modes of gravity, gravitational waves in a flat space-time background, propagation of gravitational waves in the curved space-time, Energy and momentum of the gravitational waves, Detection of gravitational waves.</p> <p>Basic Concepts and elementary idea of big-bang and steady state cosmologies, Seagull static models, Cosmological principle, Friedmann space-time, Robertson-Walker line element, Weyl's postulate, expansion of the universe, Hubble's law, dynamical equation of cosmology</p> <p>and their consequences, the primordial fire and the remnant radiation, Big-bang and steady state models of the universe.</p>
<p><b>Advanced Quantum Mechanics</b></p>	<p>Understanding, applying and formulating QM at an even deeper level than done earlier (in the QM Course).</p> <p>Applying quantum ideas to understand the scattering of particles. Employing various (approximate) methods- Partial Wave Analysis and the Born approximation.</p> <p>Understanding notion of identical and indistinguishable. Realizing origin of the Pauli's exclusion principle and related notions (Spin-Statistics connection, Permutation symmetry etc.) Formulation (along with the need) of the relativistic version of (NR) quantum mechanics. Working out in detail the two basic relativistic wave equations (Klein-Gordon and Dirac equations) and the various associated</p>

	<p>phenomenon/notions (Plane wave solutions, Negative Energies and Probabilities, Spin of electron and its magnetic moment, The Hole Concept, Particles and Antiparticles etc.)</p> <p>Understanding the need of relativistic quantum fields (towards Quantum Field Theory), Field formulations for the various wave equations via 2nd quantization.</p>
<p><b>Nuclear Physics</b></p>	<p>Understanding the atomic nucleus and its various properties along with the experimental tools and techniques of nuclear investigations.</p> <p>Understanding basic properties of the nucleus and the various nuclear models.</p> <p>Understanding the nature of the nuclear force along with experimental setup(s) to study them. Understanding radioactive decay and its various feature.</p> <p>Understanding nuclear reactions by applying (mainly) quantum ideas to them.</p>
<p><b>Elementary Particle Physics</b></p>	<p>Get a basic understanding of the fundamental constituents of our Universe (the “elementary” particles and the four fundamental interactions).</p> <p>Understanding the gauge principle and role of symmetry (along with ideas of unification). Understanding the common (mathematical) origin of (the various) conservation laws as a manifestation of (some) symmetry.</p> <p>A very basic understanding of the unification of the fundamental interactions- Electroweak and Grand Unifications.</p> <p>Understanding (hadronic) matter as composed of quarks and the “construction” schemes (i.e. various direct-product representation of SU(3)). An overview of the various properties of quarks (and also of the composite mesons and baryons).</p>

<p><b>Condensed Matter Physics</b></p>	<p>Understanding of the basic (theoretical) ideas involved in the study of Condensed Matter Physics.</p> <p>Understanding the origin of elasticity (and elastic constants) from the properties of the underlying crystal structure.</p> <p>Understanding the interaction of crystals with radiation (X-rays) and the related theoretical framework as well as experimental setup(s) (Diffraction experiments).</p> <p>Understanding the quantum treatment of elastic/sound waves (i.e. the idea of phonons and phonon gas etc.)</p> <p>Understanding the thermal properties of solids on the basis of the phonon picture.</p> <p>Understanding crystal defects, superconductivity, and magnetism.</p>
<p><b>Practical (Sem2)</b></p>	<p>The various practicals included in the Physics syllabus of M.Sc. 2<sup>nd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of various other semesters (e.g. oscillators, electronically regulated power supply, negative feedback amplifiers, FET characteristics, Michelson Interferometer, Fabry Parot Interferometer, four probe method, Fresnel's Law, Magnetic susceptibility, Radiation laws, etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<p><b>Advanced Electronics I</b></p>	<p>Understanding Integrated Circuit technology, Classification of IC's, Fabrication of IC's &amp; components, Basic monolithic integrated circuit technology, processes used in monolithic technology, active &amp; passive components, metal semiconductor contact, thick &amp; thin film IC's, hybrid IC's, charge coupled devices (CCD), advantages &amp; limitations of integrated circuits.</p>

	<p>Understanding Operational amplifiers (Linear and Non-linear Analog systems),</p>
<p><b>Advanced Electronics II</b></p>	<p>Understanding Digital communication, Digital signal processing, Image processing (Basic ideas only), Pulse Modulation systems, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse position modulation, Pulse code modulation, Delta modulation Frequency division multiplexing (FDM), Basic idea of digital telemetry.</p> <p>Learning Optical communication, Principle of optical communication, Different modes of propagation of E. M. Wave through optical fibre, Brief concept, classification of fibres and ray path, Advantages of multimode fibres and cladding , Optical Fibre connectors, Optical Fibre communication Receiver, Brief Introduction , Signal path through optical data link, Block diagram of optical Receiver, Advantages of optical communication, Light propagation in cylindrical wave guide.</p> <p>Gaining knowledge of Memory and optoelectronic devices, Bulk and thin films. Photoconductive devices (LDR), Memory devices, static and dynamic random access memories SRAM and DRAM, CMOS and NMOS, nonvolatile-NMOS, magnetic, optical and ferromagnetic memories, charge coupled devices (CCD), LCDS.</p>
<p><b>Electrodynamics</b></p>	<p>Realizing the unification of Electricity and Magnetism as a single physical concept- Electromagnetism (or Electrodynamics) and that Maxwell's equations express this fact. Understanding various electromagnetic phenomenon (EM Wave in vacuum, conductors, non-conductors, plasma, bounded media, wave guides).</p> <p>Understanding the potential formulation of ED (and its advantages).</p> <p>Understanding generation and nature of radiation (fields) from moving (accelerated) charges. Formulating ED (and writing and performing calculations) within the relativistic framework i.e. four-vector &amp; Tensor notations. Understanding the role of this relativistic formulation</p>



	and ability to apply it elsewhere.
<b>Practical (Sem 3)</b>	The various practicals included in the Physics syllabus of M.Sc. 3 <sup>rd</sup> Semester are aimed at understanding (and measuring) the phenomenon/ quantities studied in the theory papers of this semester (Richardson's Law, ESR spectra, Hall effect, multivibrators, transistor amplifiers cum feedback amplifiers, FET and MOSFET, VTVM etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.
<b>Advanced Electronics 3</b>	<p>Understanding power supply regulation including Servomechanism, regulation using OA, Zener reference source, The 723 regulator current regulator, short circuit and over load protection, Precision rectifier, IC regulated power supply. Three terminal voltage regulations, dual Polarity regulated power supplies using 78 XX and 79 XX series regulators, Switched mode power supply (SMPS), Active filter , PLL understanding microwave production with basic ideas of Microwave frequencies, Principle of velocity modulation. Reflex klystron. Theory and uses an of cavity magnetron PIN &amp; GUNN Diode, Detection of microwave measurement of power.</p> <p>Understanding Advantages and Disadvantages of Microwave transmission, loss in free space, propagation of microwaves, atmospheric effects on propagation , Fresnel zone problem, ground reflection, fading sowlles, detectors, components, antennas used in microwave communication system.</p>
<b>Advanced Electronics 4</b>	Understanding Analog computation with Solution of ordinary linear differential equations with constant coefficients, Operation modes of analog computers, repetitive operation of computers, Time scaling,

	<p>amplitude scaling, Generation of functions, Simulation of time varying systems.</p> <p>Understanding Boolean algebra, Canonical forms of Boolean, functions, Simplification of Boolean functions (K-map, Tabulation method), don't care conditions. Digital logic families;</p> <p>Adders &amp; Subtractors, Magnitude comparator, Code converters; Parallel adders, Encoders, Decoders, Multiplexers, Demultiplexers, Parity bit generator and checker, Read only memory (PROM, EPROM), P.L. Digital to Analog and Analog to Digital converters.</p> <p>Understanding Sequential logic- Memory element, RS, JK, JKMS, T type and Edge triggered Flip flop; Registers; Shift register; Counters— synchronous and Synchronous; The memory unit; Semiconductor Random Access Memory; Inter-register transfer; Arithmetic; Logic and Shift Micro-operation; Fixed point and floatation point data.</p>
<p><b>Practical (Sem 4)</b></p>	<p>Study of regulated power supply (723), operational amplifier (741), Timer (555), A to D and D to A converter, Logic gates (Different types), amplitude and frequency modulations and demodulations, different flip-flop circuits (RS, JK, Dk type, T-type, Master slave), Digital combinational and sequential circuits, Microprocessor (8085), SCR etc.</p>
<p><b>Dissertation/ Project</b></p>	<p>The student has to complete a dissertation/project (theoretical and/or experimental) and submit a written report during this last semester. This gives the students some exposure to research and research methodology. Moreover the written report enables the students to write scientific communication. All this is aimed at nurturing them into (possible) future researchers who are capable of- (a) thinking and analyzing critically and clearly (b) adopting the scientific method and (c) working independently.</p>
<p><b>Elective Courses</b></p>	

<p><b>Communication Electronics</b></p>	<p>Understanding AM and FM (Transmission and reception): Modulation, AM generation, Power consideration, Balanced modulator, SSB transmission, AM detection, AGC, Radio receiver characteristics, signal to noise ratio, FM analysis, noise considerations, generation, direct method and reactance tube method, FM transmitter, AFC, FM Propagation, phase discriminator.</p> <p>To know the propagation of radio waves, Antenna and TV.</p> <p>Study of transmission lines, Voltage and current relations on transmission line, propagation constant, characteristic impedance, impedance matching, quarter wave T/L as impedance transformer, attenuation</p> <p>along coaxial cable, cables of low attenuation, propagation of radio waves between two parallel lines, wave guide modes, TE<sub>10</sub> mode and cut off wavelength, cavity resonator, light propagation in cylindrical wave guide, step index and graded index fibers, attenuation and dispersion in fibers.</p>
<p><b>Plasma Physics</b></p>	<p>Introduction to Plasma, Elementary concept: Derivation of moment Equation from Boltzmann Equation, Plasma Oscillation, Debye Shielding, Plasma parameter, Magneto plasma, Plasma confinement.</p> <p>Understanding MagnetoHydrodynamics and magneto Plasma</p> <p>To study plasma propagation and fluid plasma, Propagation at finite angle and CMA diagram, Propagation through ionosphere and magnetosphere, Helicon, Faraday rotation, Fluid equations for a plasma, Continuity equation, Momentum balance equation, Equations of state, Two-fluid equations, Plasma resistivity.</p>

<p><b>Digital Electronics and Computer Architecture</b></p>	<p>Learning elementary idea of combinational and sequential circuits, Overview of Microcomputer organization and operation, Microprocessor evolution and types, Fundamental knowledge of Microprocessor (8085/8086), Architecture and its operation, Basic idea of logic devices for interfacing 8085/8086.</p> <p>Understanding Computer Organization and Architecture</p> <p>Understanding data communication, Computer and Communications, Need for communication networks, Internet and World Wide Web, communication protocols, Local Area Networks, Interconnecting networks, Future of Network Technology.</p> <p>To study Characteristics of communication channels, Allocation of Channels, Physical Communication media, Public Switched Telephone Network, Cellular Communication Path, ATM networks.</p>
<p><b>Atmospheric Physics</b></p>	<p>To gain knowledge about Earth atmosphere, Elementary concept of atmospheric sciences, atmosphere and its composition, Thermal and pressure variation in earth atmosphere, Thermal structure of the troposphere, stratosphere, mesosphere and ionosphere, Hydrostatic equation, spectral distribution of the solar radiation, Green house effect and effective temperature of earth. Meteorological process and different system, local winds, monsoons, fogs, clouds, precipitation, Cyclones and anti-cyclones, thunderstorms, Mountain Meteorology.</p> <p>Understanding Atmospheric Dynamics and Thermodynamics, Environmental pollution and climate change</p> <p>Study of Convective measurements of pressure, temperature, humidity, wind speed and direction, sunshine duration, radiation clouds, upper air pressure, temperature, humidity and wind measurements, Polit balloons, radiosonde, dropsonde, ozonesonde, GPS sonde. Application</p>

	<p>of radars to study the atmospheric phenomenon, LIDAR, SONAR, RASS</p> <p>(Radio- acoustic sounding system), Observational technique for aerosol.</p>
<p><b>Introduction to Nanoscience and Nanotechnology</b></p>	<p>Understanding Emergence of Nanotechnology – Challenges in Nanotechnology, Carbon age–New form</p> <p>of carbon (From Graphene sheet to CNT), Introduction to nanomaterials, evolution of nanoscience, general properties of nanomaterials, role of size in nanomaterials, semiconducting nanoparticles, nanoclusters, quantum wells, conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state. Synthesis of nano structured materials, sol-gel processing, Mechanical alloying and mechanical milling, Inert gas condensation technique, Nanopolymers, Bulk and nano composite materials, top down and bottom up approaches.</p> <p>Study of properties of nanomaterials and characterization techniques.</p> <p>Learning about the applications of nanomaterial to Molecular electronics and nanoelectronics, Quantum electronic devices, Carbon Nano Tube</p> <p>based transistor and Field Emission Display, Biological applications, Biochemical sensor, medical applications and Membrane based water purification. Biological systems- DNA and RNA - Lipids.</p>
<p><b>Self study Courses</b></p>	
<p><b>Advances in High Energy Physics</b></p>	<p>Understanding Gauge Theory and Unification of Fundamentals Forces, Quantum Chromodynamics, Thermal Field Theory and Beyond Standard Model</p>

<p><b>Advances in Laser Physics</b></p>	<p>Understanding Laser Raman Spectroscopy and Laser Spectroscopy in Molecular Beams.</p> <p>To gain knowledge of Modern Laser Spectroscopy.</p>
<p><b>Advances in Solar Physics</b></p>	<p>Learning about Solar Flares: Magnetohydrodynamic Processes, Solar Cycle: Observations and theory, Sun-Earth Connection.</p>
<p><b>Bio-Physics</b></p>	<p>To Know the Basic Concepts of Bio-Physics</p> <p>Understanding Technique For The Study of Biological Structure and Function</p> <p>To study the Radiation Effects on Biological Systems</p>
<p><b>Computer Application in Physics</b></p>	<p>Understanding the role of Computers in Physics, Formulation of a problem for solution on a computer, paradigm for solving physics problems for solution . Algorithms and Flowcharts</p> <p>Learning Scientific Programming (FORTRAN and C language), Scientific Word Processing and Modern Software's For Mathematical Computing (LaTeX and MatLab).</p> <p>Study of Computer Applications to Physical Problems(Numerical Methods and Monte Carlo methods).</p>
<p><b>Medical Physics</b></p>	<p>To know about the mechanics of human body, Physics of Respiratory and Cardiovascular System.</p> <p>Understanding Electricity in the Body and Sound/Light In Medicine and Diagnostic X-Rays and Nuclear Medicine.</p> <p>To gain knowledge about Medical Precision Equipments and Modern Medicines (MRI, PET, CT scan, ventilators, description, working, analysis and clinical applications of Ultrasonic imaging, ECG, EMG, EEG and ERG. Nanotechnology-based drugs e.g. Abraxane, Doxil, C-</p>

	dots (Cornell dots) and goldnano particle as a diagnostic tool, Anti-cancer polymeric nanomedicines, Use of nano-technology in Photodynamic therapy.
<b>Optical Communication</b>	<p>Understanding Evolution of fiber optic system- Element of an Optical Fiber Transmission link- Ray Optics, Optical Fiber Modes and Configurations -Mode theoryof Circular Wave guides- Overview of Modes-Key Modal concepts- Linearly Polarized Modes -Single Mode Fibers- Graded Index fiber structure.</p> <p>Study of Signal Degradation Optical Fibers and Fiber Optical Sources And Coupling, Fiber Optical Receivers and Digital Transmission System.</p>

**DEPARTMENT OF BOTANY**  
**H.N.B. PG COLLEGE KHATIMA**

**(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 postgraduate and Ph.D. students in the field of plant sciences that serve in academic and research institutions.
3. To serve society's needs and contribute to transforming 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 synthesize 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 organizations and societies.

**PROGRAM OUTCOME:**



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

PO-1: Understand the 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, and their economic and ethnobotanical importance.

PO-5: Differentiate between different types of ecosystems and their structural components.

PO-6: Evaluate services provided by different ecosystems in the 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: Analyze the regeneration status of different tree species in their natural habitat. PO-10. Develop strategies for the conservation of rare and threatened plant species.

PO-11: Develop a protocol for propagation of economically and medicinally important plant species through plant tissue culture.

#### **PROGRAM SPECIFIC OUTCOME (PSOS):**

After the successful completion of the 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 for competitive exams like UPSC, NET, SET, GATE, etc.

PSO 3: Understand the multi-functionality of plants in the 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 U.G. LEVEL:**

1. Students will be able to explain how organisms function at the level of the biomolecules, genes, genome, cells, 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 P.G. 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.

# **DEPARTMENT OF ZOOLOGY**

## **HNB PG COLLEGE KHATIMA**

### **SYLLABUS/PROGRAM OUTCOMES**

1. Acquired the knowledge with facts and figures related to various papers in zoology such as Animal Diversity, Taxonomy, Evolution, Genetics, Biochemistry, Endocrinology, Toxicology and Ecology and animal behavior.
2. Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in the day-to-day life.
3. Acquired the skills in handling scientific instruments, planning and performing in laboratory equipments.
4. The skill of observation and drawing logical inference from the scientific experiments.
5. Analyze the given scientific data critically and systematically and the ability to draw the objective conclusions.
6. Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
7. Realize how developments in any science subject help in the development of other science subject and via versa and how interdisciplinary approach helps in providing better solution and new ideas for the sustainable development.
8. Develop various communication skills such as reading, listening, speaking, etc.
9. Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

### **SEC (UG LEVEL) PUBLIC HEALTH AND HYGIENE- OUTCOMES**

### M.A. 3<sup>rd</sup> SEM.

PAPER I	Indian Political thought	Students can get the ideology of Indian political thinkers.
PAPER II	Political Ideology	This paper helps the students to understand the knowledge of the world's famous ideologies.
PAPER III	Political thought (from Lenin to Rawls)	The Student will be able to get the knowledge of the ideology of famous communist thinkers.
PAPER IV	Gandhian Discourse in Politics	The Student will get knowledge of the main elements of Gandhian ideologies.
PAPER V	Human Rights / Local self Government/ India in World Affairs	The Students will learn to take an overview on Human Rights, Local self Government and India in World Affairs

### M.A. 4<sup>th</sup> SEM.

PAPER I	Contemporary Political Philosophy	The students will be able to understand contemporary political ideologies.
PAPER-II	Environmentalism	The Student will get the knowledge of environmentalism from political angle.
PAPER III	Post-Cold War International Relations	Students can get the knowledge of the new world order and issues after the post-cold war international relations.
PAPER IV	International Organization	Students can get the knowledge of emerging history and objectives of international military and non-military organization.
PAPER V	Research Methodology/Ethics and Politics	Students can get the basic knowledge of keen factors related with research methods.
PAPER VI	Viva- Voce	To improve the personality development for future prospective.

*P. Chandh*

विभागाध्यक्ष  
राजनीति शास्त्र विभाग  
६०१०४०२० स्नातकोत्तर महाविद्यालय  
खटीमा (ऊधम सिंह नगर)

# **DEPARTMENT OF ZOOLOGY**

## **HNB PG COLLEGE KHATIMA**

### **SYLLABUS/PROGRAM OUTCOMES**

1. Acquired the knowledge with facts and figures related to various papers in zoology such as Animal Diversity, Taxonomy, Evolution, Genetics, Biochemistry, Endocrinology, Toxicology and Ecology and animal behavior.
2. Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in the day-to-day life.
3. Acquired the skills in handling scientific instruments, planning and performing in laboratory equipment.
4. The skill of observation and drawing logical inference from the scientific experiments.
5. Analyze the given scientific data critically and systematically and the ability to draw the objective conclusions.
6. Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
7. Realize how developments in any science subject help in the development of other science subject and vice versa and how interdisciplinary approach helps in providing better solution and new ideas for the sustainable development.
8. Develop various communication skills such as reading, listening, speaking, etc.
9. Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

### **SEC (UG LEVEL) PUBLIC HEALTH AND HYGIENE- OUTCOMES**

Students understood the importance of hand washing, sanitation and hygiene, safe drinking water; household cleaning and food safety constitute the main focus for hygiene interventions in the college, home and community level.

#### **OUTCOME OF SPECIAL PAPERS (PG LEVEL)**

1. Fishery Science: Students describe the knowledge necessary for professional or academic work in the field of aquaculture and fisheries.
2. Evaluate the importance of diversity as well as the role of social factors (e.g. culture, economics, policy) on aquaculture and fisheries from local to global scales.
3. Demonstrate the basic technical skill necessary for work in aquaculture and fisheries (e.g. data collection and analysis, scientific methods etc.)
4. Create local and global solution to complex challenges in aquaculture and fisheries.
5. Students become familiar with Earth system and the manner in which they have been modified by human activity over time, especially with regards to coastal ecosystems. Recognize and appreciate the diversity of human culture and their relationship to local and global ecosystems. Develop a personal environmental ethic.

#### **OUTCOMES OF IMMUNOLOGY (PG LEVEL)**

1. Trace the history and development of immunology.
2. Understood the organization of immune system.
3. Learn how cell culture is used for research in cancer.
4. Understand the vaccines and their importance.
5. Learn how cancer defeats the immune system.

#### **OUTCOMES OF IMMUNOLOGY (PG LEVEL)**

1. Learn how microorganisms are used as model system to study basic biology, genetics, metabolism and ecology.
2. Learn laboratory skills i.e. preparation of and viewing samples for microscopy, culture techniques, viewing samples in microscopy to identify microorganisms etc.
3. Overall students develops hypothesis generation and testing, including the development of theoretical and practical skills in the design and execution of experiments.

