

**A.P.B Govt. P.G. College, Agastyamuni, Rudraprayag**

**Department of Chemistry**

**Program outcomes and course outcomes**

**2023-24**

## **Graduation-**

*Courses affiliated from SDSUV (UG -I year and UG-II year semester pattern under NEP 2020 and III-year annual pattern)*

**Program outcome:** - Chemistry is important since so many other fields of study rely on specific ideas and notions from it. Undergraduate chemistry programs at the university and college levels aim to educate students for a wide range of disciplines where a foundational understanding of chemistry is necessary, including academics and professional positions in a variety of enterprises and research institutes. The U.G program under SDSUV provide 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: -**

*Under semester pattern in UG I year -Certificate in Introductory Chemistry*

In I and II semester the major paper is **Fundamental of Chemistry-I** and **Fundamental of Chemistry-II**. The content of course includes inorganic, organic and physical chemistry. This course includes the fundamental study of atomic structure, periodic properties, Nature of chemical bonding, related theories. This course gives the understanding of structure, bonding, mechanism and stereochemistry of organic compounds and the study of different functional groups in organic molecules. 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. Students will be able to understand the qualitative and quantitative chemical analysis of the compounds in the laboratory.

### ***Under semester pattern in UG II year - Diploma in Chemical Science***

In III and IV semester the major paper is **General Chemistry-I** and **General Chemistry-II**.

This course includes the basic theories of chemistry, chemistry of transition elements, study of organic functional groups and laws of thermodynamics chemistry. It provides the theoretical as well as practical knowledge of handling chemicals. The experimental work during the diploma course will enhance the skill of the students regarding chemical and physical tests of inorganic as well as organic compounds along with some physical experiments which will be beneficial to achieve their goals in industrial sectors.

### **VOCATIONAL/SKILL COURSE (*applicable for UG-I and II year only, NEP 2020*)**

**Basic Analytical Chemistry:** - This course is value-based and/or skill-based and is aimed at providing hands-on-training, competencies, skills, etc. This course may be chosen from a pool of courses designed to provide skill-based knowledge. Basic analytical techniques will be taught in this course. From this course student learn to Characterize/test various organic/inorganic molecules using different analytical techniques. Learn about various sampling methods and can work as a sample analyst.

### **Minor elective**

#### **Basics of Chemistry**

This course provides the basic information about chemistry. The course includes the study of constituents of matter, particles and the fundamental study of atomic structure, periodic properties, nature of chemical bonding and some idea of states of matter and thermochemistry.

***In annual pattern in UG III year, main streams of chemistry are bifurcate as three papers. The outcomes of those are given as: -***

**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.

**Organic Chemistry:** - This course gives the understanding of structure, bonding, mechanism and stereochemistry of organic compounds and the study of different functional groups in organic molecules. Also, it involves the study of biomolecules like carbohydrates, amino acids proteins, vitamins which constitutes of body and monitor the functioning of life.

**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. This branch of science deals with the quantitative relationship between heat and other forms of energy called thermodynamics and the chemistry related to electrolytes called electrochemistry.

## Post-Graduation: -

**Program outcome:-** The P.G program give 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 help in the real analysis.

### **Course outcome: -**

**Inorganic Chemistry: -** This Course encompass the theories and bonding concepts in coordination compound and acids-bases in detail. The interesting chemistry of organometallic compounds.

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

**Physical Chemistry: -** This course includes the thermodynamic and kinetic behavior of reaction and various theories for reaction kinetics. Also, the course provided information about quantum and statistics.

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

**Group Theory and Instrumentation techniques: -** 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.

**Reagents in organic synthesis and Organometallics: -** The important transformation like oxidation-reduction, substitution, addition, elimination in organic reaction have been performed

using specific reagents and conditions, this course covers all the important reagents for such transformations.

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

**Chemistry of Natural Products:** - This course includes the study of natural products like alkaloids, terpenoids, steroids, vitamins and their extraction, purification, chemical effects and applications.

**Organic Synthesis:-** The synthesis of organic molecules involves 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.

**Heterocyclic Chemistry:** - Heterocyclic molecules are of great importance in medicinal or drug chemistry. This course covers the preparation, properties, reactivity and application of different type of heterocycles

**Environmental Chemistry:-** This course give idea about environmental terminologies, natural cycles like hydrological, oxygen and nitrogen cycles and composition of atmosphere. Knowledge about air- water pollution, their cause, effects and outcome. The purification process, the analytical methods involve for measuring the air-water quality parameters and standard.

**Project/Dissertation**

# **Department of Economics**

## **Introduction**

Economics is the study of how individuals and societies allocate limited resources to meet their unlimited wants, focusing on the fundamental problem of scarcity and choice. It examines the interaction of supply and demand, which determines prices and quantities in markets. Key concepts in economics include opportunity cost, market structures, and the trade-offs involved in decision-making. Microeconomics delves into individual and firm-level decision-making, while macroeconomics addresses broader economic issues such as income, employment, inflation, and national income. Public finance explores the financial role of governments, including expenditure, revenue, and debt. International economics looks at global trade dynamics, foreign exchange rates, and optimum currency theories. Quantitative methods and statistical techniques help analyze economic data and trends. The study of regional economies, such as Uttarakhand's, provides insights into local growth, welfare, and sectoral development.

## **Basics of Micro Economics**

The study of microeconomics helps students grasp the theoretical foundations of the subject. They gain an understanding of key concepts such as consumer behavior, production, demand, and supply. It also enables them to analyze price and output determination for firms and industries in various market structures. Additionally, students explore the concept of welfare in modern economics. This knowledge builds a strong foundation in economic principles

**Programme Outcome:** Economics is the study of how individuals and societies allocate limited resources to satisfy unlimited wants, focusing on the fundamental problem of scarcity and choice. It examines the interaction of supply and demand, which determines prices and quantities in markets. A key concept in economics is opportunity cost, highlighting the trade-offs involved in decision-making. The study also explores different market structures, such as perfect competition and monopoly, and their impact on price and output determination. Additionally, it considers various economic systems, including capitalism, socialism, and mixed economies, and how they manage resources and production.

## **Basics of Macroeconomics**

Students study macroeconomics and explore various theories on income and employment determination proposed by different economists. They gain insights into the consumption and investment functions, as well as the concept of the multiplier. Additionally, they learn about money and banking systems while understanding theories related to inflation and employment rates. This equips them with a comprehensive understanding of key macroeconomic principles.

**Programme outcome:**By completing this syllabus, students will develop a solid understanding of macroeconomic concepts, including income and employment theories, consumption, investment, and the multiplier effect. They will also gain knowledge of money, banking systems, inflation, and employment rate theories. This equips them to analyze and interpret key macroeconomic issues effectively.

### Basics of public finance

Students become familiar with the concept of maximum social advantage, along with key aspects of public finance, such as public expenditure, public revenue, and public debt. They learn how these elements influence economic policies and societal welfare. This knowledge helps them understand the financial role of the government in the economy.

**Programme outcome:**Students gain a thorough understanding of public finance concepts, including public expenditure, revenue, and debt, and their impact on economic policies. This knowledge enables them to analyze the government's financial role in promoting societal welfare.

### Money, Banking & International Trade

Students gain an understanding of money and banking, along with the functioning of the Indian monetary system. This equips them with insights into its structure and operations.

**Programme outcome:** Students develop a clear understanding of money, banking, and the functioning of the Indian monetary system. This knowledge enables them to analyze financial systems and their role in the economy.

## Master of Arts

### Micro Economics

students learn the fundamentals of microeconomics, including the theory of demand, consumer equilibrium, production, and cost theories. They explore market structures, commodity pricing, and

factor pricing. This provides a comprehensive understanding of economic decision-making and resource allocation.

**Programme outcome:** Students grasp key microeconomic principles such as demand theory, consumer equilibrium, production, costs, market structures, and pricing of commodities and factors. This equips them with the ability to analyze economic decisions and resource distribution effectively.

### **International Economics**

Students study international trade theory, commercial pricing, balance of payments, and foreign exchange rates. They also explore optimum currency theories to understand global economic interactions and currency management.

**Programme outcome:** This knowledge helps students understand global trade dynamics, pricing strategies, and the functioning of international financial systems. It prepares them to analyze and navigate complex global economic issues and currency management.

### **Macro Economics**

Students study concepts like income, employment, and national income, along with classical theories of income and employment. They explore inflation, deflation gaps, investment and consumption theories, the multiplier effect, money, interest rates, prices, and trade cycles.

**Programme outcome:** Students will learn key economic theories related to income, employment, inflation, investment, consumption, and the functioning of money and trade cycles.

### **Quantitative Methods and Statistical techniques**

Students study the functions, limitations, and importance of statistics, along with key concepts like correlation, skewness, kurtosis, variance, index numbers, time series, regression analysis, and the association of attributes.

**Programme outcome:** The outcome of this syllabus will equip students with the ability to apply statistical methods to analyze data, interpret trends, and make informed decisions in various fields of study.

### **Uttarakhand Economy**

Students explore the economic landscape of Uttarakhand, including regional disparities, agricultural land use, industrial growth trends, and welfare measures. They also study key sectors such as horticulture, migration, hydropower, and tourism.



**Programme outcome:** The outcome for students will be a comprehensive understanding of Uttarakhand's economy, including key sectors, regional disparities, and growth trends, enabling them to analyze and contribute to regional economic development.

## Department of English

### **Undergraduate**

Programme Outcome (2022-23)

English plays an essential role in our lives. This is the main language for studying all subjects around the world. English is important for by students because it improves their quality of life broadening their horizons, developing emotional skills, and providing employment opportunities. In addition, the use of English as an international language has increased over time as it is the only means of communication in many countries. Provide students an extensive view of the cultural and social patterns of the society in the specific time and situations in which it flourished in an intellectual and emotional engagement with the work. Make students aware of the different kinds of literature written /translated in various English speaking countries across the world as well as the literature from Asia.

### **Course outcomes:**

### **B.A FIRST SEMESTER:INTRODUCTION TO ENGLISH PROSE (CORE COMPELSURY)**

Get an Introductory knowledge of the development and significance of literature in English. Develop an understanding of the basic prose devices to read, identify and analyze various literary forms of prose.

Learn the art of story-telling through short stories and define its basic elements such as plot, characterization and narrative technique. Critically evaluate the

style and contributions of some of the greatest short-story writers, including Indian writers towards the development of short-story as a genre.

**VOCATIONAL COURSE: ICT RESOURCES AND TECHNOLOGY**  
**ENABLED LEARNING**

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

- Learn ICT
- Improve fluency through regular practice and speaking skills.
- Learn inter-personal and intra-personal communication with ICT.
- Improve listening and speaking skill.
- Learn ICT and AI use for learning.

**B.A SECOND SEMESTER: HISTORY OF ENGLISH LITERATURE**

After studying this course, the students will be able to develop an understanding of the evolution of English literature, the concept, causes and the impact of Renaissance and Reformation.

Trace the origin and development of English drama through Miracle and Morality plays and the plays of university Wits. Understand the characteristics of Elizabethan and Metaphysical poetry and special Features of Neo-classical age and its literature.

Comprehend the basic difference and special characteristics of the major literary tendencies of various ages and develop familiarity with major literary works by British writers in the field of Poetry, Drama and fiction.

## **VOCATIONAL COURSE: ENGLISH LISTENING AND SPEAKING SKILLS**

Students will be able to learn basic concepts of phonetics. Improve fluency through regular practice and speaking drills.

Learn the skills of facing interviews, making a speech, presentation etc. develop their own creativity by enhancing their writing skills. Get enhanced /enriched vocabulary to demonstrate a significant modification in their speaking skills and writing techniques.

Organize and write paragraph short essays in a variety of rhetorical styles.

## **VOCATIONAL COURSE (NEW): TECHNICAL COMMUNICATION SKILL**

- Students will be able to learn basic concept of ICT.
- Learn verbal and non-verbal communication.
- Learn basics of English grammar.

## **MINOR ELECTIVE: CREATIVE WRITING**

The course will help students to describe or express their opinions on topics of personal interest such as their experiences of events, their hopes and ambitions.

Read and understand information on topical matters and explain the advantages and disadvantages of a situation.

Write formal letters, personal notes, blogs, reports, and texts on familiar matters. Comprehend and analysis text in English.

### **B.A THIRD SEMESTER: BRITISH POETRY (CORE COMPELSURY)**

After studying this course, the students will be able to identify various forms of poetry and understand the development of these forms in the works of greatest practitioners of these poetic forms.

Characterize some basic stanza patterns, their origin and elements. Critically analysis poems with an understanding of its basic elements. Understand and gain informative understanding of the poems written by modern British poets. Able to learn about transition of poetic style and form. Elizabethan age to the 20<sup>th</sup> century. Understand the history, significance and scope of translation, in Indian context.

### **VOCATIONAL COURSE: LANGUAGE THROUGH LITERATURE**

At the end of the semester students will be able to improve their grammatical competence.

Learn the art of writing paragraphs, essays, and letters, Biodata, Resume and CV

Identify the meaning of homophones and homonyms.

### **B.A IV SEMESTER: WOMEN'S WRITING AND INDIAN LITERATURE IN TRANSLATION**

- This course aims to help students understand the social construction of woman
- by patriarchy.
- Examine feminism's concerns of equality with men.
- Highlight the structural oppression of women.
- facilitate an understanding of the body of woman and its lived experience.

## **VOCATIONAL COURSE: FUNCTIONAL ENGLISH AND TRANSLATION**

- Learn the formation of words and making of new sentences.
- learn the techniques of report writing, minutes, notices and agendas
- become skilled at translating from Hindi to English and vice-versa

### **B.A II Year**

#### **Paper I: Poetry**

Students are trained in getting acquainted with modern poetic forms and genres through classroom lectures and discussions.

#### **Paper II: Fiction**

Students are encouraged to read texts followed by critical essays and develop their ideas and arguments around British and Indian Fictions.

### **B.A III Year**

#### **Paper I: Indian and American Poetry**

Students get introduced to Indian literary traditions such as poems and Epics. Through this course they are able to locate American Poetry as a second world literary site.

## **Paper II: Drama**

This course introduced to different genre of American literature. It represents modern drama in English Literature.

### **Programme Outcome**

Po 1: the programme educates students in both the artistry and utility of the English language and literature through an aesthetic study of Language and the various historical and contemporary forms of texts.

Po2: The programme helps student for their personal interest in literature, and develops their reading and writing skills in English.

## **M.A in English (4 Semester)**

### **Semester I**

Paper I: English Literature from Chaucer to John Milton

This course familiarizes students with the early modern world, earlier called the Renaissance, through poetry, fiction and philosophy. It familiarizes students with literary texts and intellectual debates of 16<sup>th</sup> or 17<sup>th</sup> century Europe.

Paper II: Drama Excluding Shakespeare

The main features of Shakespeare drama taught: liberty from the unities, philosophical complexity. This course introduced students with drama of the 16<sup>th</sup> or 17<sup>th</sup> centuries with a focus on the play of Shakespeare.

### Paper III: Early Humanist's Literature

Students familiarize with humanist writers of classical literature and regions. It introduces the students to idea of classicism.

### Paper IV: English Prose

Students learn how to analyses a text or textual passages (prose). Students are encouraged to read texts followed by critical essays.

## **M.A 2<sup>nd</sup> Semester**

### Paper V (William Shakespeare)

The student exposed to the main contemporary critical approaches to Shakespeare: Feminist, new historicist. They learn about drama as well as the generic differences between the tragedy and the comedy.

### Paper VI (18th Century Literature)

To uncover the radical potential of poetry, A Foundational level of fluency with the basics of poetry will have been achieved.

### Paper- VII: (American Literature)

This introductory course offers insights into the literatures of the Americas written in English. This course will introduce students to writings across the Americas.

### Paper VIII: (19<sup>TH</sup> Century literature)

Students will be trained to understand the continuities between the nineteenth century and high modernity.



Paper –IX (Dissertation and Viva –Voce)

Discussing Exam Questions and Making students give presentations.

### **M.A III Semester**

Paper- X (20<sup>th</sup> century poetry)

Students will gain a critical appreciation of varied genre of poetry and their contexts building upon skills and insights they acquired in poetry.

Paper- XI (Indians Writing in English)

The course aims to give students a glimpse of a vast diversity of modern Indian writings. Students also read Rabindranath Tagore as a poet and understand his views on humanism.

Paper XII (b) Literary Criticism –II

To build on students understanding about the principals of western European philosophy and theory. Students will gain familiarity with a range of twentieth and twenty-first century theoretical approaches.

Paper- XIII (b) (Literature and Gender)

This course will familiarise students with theorising about gender, be it feminism, queer studies or masculinity studies. The students will be taught to interpret a text and read social change through the lens of gender.

### **M.A IV Semester**

Paper- XIV (20<sup>TH</sup> Century Drama)

This course is a genre- based and performance oriented course. It provides learners with an overview of formative theatrical movements in Europe. The plays included focus on innovative performance trends that began at the end of the twentieth century and evolved into diverse forms in the twentieth century.

#### Paper – XV (Literary Criticism)

Students will acquire skills in the handling of theoretical issues related to the study of literature and culture.

#### Paper- XVI (a) (Literature of Indian Diaspora)

Students will get a critical introduction to the fascinating yet highly contested field of diasporic literature and theory.

#### Paper- XVII (b) (Indian Literature in Translation)

This course introduces students to literary texts from a range of regional, cultural, social and political locations within India since independence. It train the students in a multi-genre approach to Dalit writings also.

#### Paper- XVIII (Dissertation and Viva Voce)

To enable the students to analyse texts and identify the generic distinctions across prominent milieus and regions. To enable students to understand various paradigms of research, its tools, ethics and challenge related to English studies and related fields and develop creative and academic skills in them.

**Department of History**

**APB PG College Agastyamuni**

**Program outcomes, course outcomes, specific program outcomes**

There is a three year degree program in History.

Here is program outcome of subject-

Course	program outcomes
1. History of India (Earliest times to 300 A.D.)	Students will develop an understanding of nature of History and will also obtain preliminary knowledge of archaeology. They will understand the rise and expansion of the empire. Emergence of religious reforms and evolution of Buddha-Jain teaching.
2. History of India (300 A.D. to 1200 A.D.)	Students will be able to understand the decline of central power and features of decentralization. Students will obtain knowledge about rise of feudal system.
3. History of India(1200 A.D. to 1526 A.D.)	Students will understand the nature of foreign invaders and destruction of Indian ancient temple-social and cultural values. It will provide a clear idea about the Sultanate and Mughal empire. Their establishment, consolidation and fall.
4. History of India from 1526 A.D. to 1757 A.D.	Students will be able to understand the Mughal Era and development of indo-islamic culture. They can understand the administrative and cultural impact of Mughal Empire on the present time.
5. History of India (1707 A.D. to 1947 A.D.)	Students will understand the deep impact of colonialism on India. It badly affects the socio-economic condition of India. They will understand the contribution of freedom fighters in the struggle for independence.
6. World History (1815 A.D. to 1945 A.D.)	Student will connect to the global history. They will understand how the nationalism changes the nation-state system. Two world war and peace process. Declaration of a worldwide organization name- UNO. Rise of a Bipolar world between USA and USSR. Victory of democratic forces over the Nazi-Fascist terror.

### Course outcomes

Course	Course outcomes
1. History of India (Earliest times to 300 A.D.)	The course has been designed in such a manner that a student can get an idea of nature of history and early stage of human development. It also covers the religious perspective of early Indian history and Santana Vedic dharama.
2. History of India (300A.D. to 1200 A.D.)	The course has been designed in such a manner that student can get an idea of foreign attack when central power had fallen and regain the power by another dynasty. They also get the knowledge about the rise of different regional powers with their struggle and coming of Islam in India.
3. History of India (1200 A.D. to 1526 A.D.)	The course has been designed in such a manner that a student can get a clear idea of establishment, consolidation and decline of Sultanate and Mughal. It also gives ideas on different regional power (Maratha,Jaat,Rajput revolt..Etc) administrative and cultural aspects during the period.
4. History Of India from 1526 A.D. to 1756 A.D.)	From this course students will be able to know how the Mughals established a large empire in India and how they fix their policies towards local states. The course is also given the idea of decline of Mughal Empire.
5. World History (1815 A.D.to 1945 A.D.)	The course has given the idea that America emerged as a 'United State' after the civil war. It also give the idea about nation building on the basis of nationalism. The curriculum has been designed in such a manner that it gives a clear idea about the circumstances, reasons and consequences of the first and second world war. It also shows the steps taken towards peace -keeping effort around the world .
6. History of India (1707 A.D. to 1947 A.D.)	This paper deals with the war raged by the East India Company to control the landscape of India. It also gives a clear picture about the establishment of the British Raj. In this paper students can learn about the unique way to fight to obtain freedom from colonial rule. Students can also learn about Gandhi's way of non violence-Satyagrah-civil disobedience against the oppressive British regime. perspective of Indian History like nationalist, imperialist and Marxists.The course shows the success story of freedom struggle. Partition of India on the basis of religion and communal politics of Jinnah. Failure of congress leadership because for the first time in our civilization A great nation and the land is divided. An oppressive religious state like Pakistan is created.

### **Program Specific Outcomes**

- \*\*\*Graduates from our department will be able to do work as Researcher in various field of history.
- \*\*\*They can use their knowledge as a subject in the various examination to serve the society as a civil servant.
- \*\*\*Students can be an Archeologist and explore new dimension of early human development.
- \*\*\*Students also be the part of the formation of polices and planning of writing History.
- \*\*\*Students can work with the Archeological Survey of India, Museum of center and state government.
- \*\*\*Students can works as a guide and expert on historical-religious- sites of Uttarakhand
- \*\*\*Student can pursue higher education in different branches of History.

DEPARTMENT OF HISTORY

NAME OF HEAD OF DEPARTMENT – Mrs. Deepti Rana

(Signature)

APB PG College, Agastyamuni, Rudraprayag



**Department of Philosophy**  
**Government P.G. college, Agastyamuni,**  
**Rudraprayag, Uttarakhand.**

**Programme Outcomes for a 3-Year Undergraduate**  
**Course in Philosophy**

This 3-year undergraduate programme in Philosophy is designed to provide a comprehensive understanding of philosophical traditions, both Indian and Western, along with ethical reasoning and applied philosophical skills. The programme integrates a focus on Jainism, Buddhism, and Yoga to foster a holistic approach to philosophical inquiry and life skills. Graduates will gain critical thinking abilities, interdisciplinary knowledge, and vocational skills to address contemporary challenges.

**Programme Outcomes (POs)**

**1. Understanding Philosophical Traditions**

- Develop an in-depth understanding of major Indian philosophical systems, including Nyaya, Mimamsa, Vedanta, Jainism, and Buddhism, alongside Western philosophical traditions and their historical contexts.

**2. Critical Thinking and Reasoning**

- Cultivate analytical reasoning and problem-solving skills by engaging with classical and contemporary philosophical debates, logical analysis, and applied ethics.

**3. Ethical Awareness and Decision-Making**

- Explore ethical principles and frameworks, enabling students to make informed, value-based decisions in personal, professional, and societal contexts.

**4. Interdisciplinary Knowledge and Holistic Living**

- Integrate knowledge of Yoga philosophy and its application in health, education, and better living to promote well-being and a holistic lifestyle.

**5. Cultural Sensitivity and Diversity**

- Appreciate the richness of Indian philosophical heritage and its relevance in a pluralistic society, fostering respect for cultural diversity and interfaith dialogue.
- 6. Skill Development and Employability**
- Acquire practical skills through vocational and applied philosophy papers, such as Yoga as holistic health and Yoga education, preparing students for careers in wellness, education, and community development.
- 7. Research and Academic Skills**
- Gain foundational skills in philosophical research, hermeneutics, and textual analysis, enabling students to pursue higher education and scholarly contributions.
- 8. Social and Political Awareness**
- Analyse socio-political and religious ideas through the lens of philosophy, equipping students to engage critically with contemporary societal issues.

### **Programme-Specific Outcomes (PSOs)**

#### **First Year:**

- Gain foundational knowledge of Indian Philosophy and Ethics.
- Develop specialized insights into Jainism and Buddhism as minor elective papers.
- Learn the fundamentals of Yoga Philosophy and its application in daily life through skill-based papers.

#### **Second Year:**

- Explore key themes in Western Philosophy and formal logic to enhance analytical skills.
- Apply Yoga philosophy to holistic health and better living, emphasizing well-being and lifestyle improvement.

#### **Third Year:**

- Delve into the Philosophy of Religion, Contemporary Indian Philosophy, and Socio-Political Philosophy to understand modern challenges.
- Study Greek Philosophy to trace the roots of Western thought and its influence on contemporary issues.

### **First Years (semester-I)**

### **Course Outcomes (COs) of Indian Philosophy(Major Course)**



1. Comprehend Foundational Schools of Indian Philosophy
2. Analyse Theories of Knowledge and Reality
3. Examine Ethical and Practical Teachings
4. Engage with Philosophical Debates on God and Liberation
5. Apply Indian Philosophy to Modern Contexts

#### **Course Outcomes (COs) of Jainism (Minor)**

1. **Understand Core Jain Philosophical Concepts**
2. **Explore Ethical Teachings**
3. **Study Jain Cosmology and Metaphysics**
4. **Appreciate Jain Contributions to Sustainability**
5. **Apply Jain Philosophy to Contemporary Issues**

#### **Course Outcomes (COs) of Yoga as Applied Philosophy (Skill Enhancement)**

1. **Understand the Philosophical Foundations of Yoga**
2. **Apply Yoga for Personal and Professional Growth**
3. **Promote Holistic Health and Wellness**
4. **Foster Ethical Living through Yoga Principles**
5. **Address Contemporary Challenges with Yoga Philosophy**

#### **First Years (semester-II)**

#### **Course Outcomes (COs) of Ethics (Major Course)**

1. **Understand Ethical Theories and Frameworks**
2. **Analyse Ethical Dilemmas**
3. **Explore Indian Ethical Traditions**
4. **Foster Personal and Social Responsibility**
5. **Apply Ethics to Modern Challenges**

#### **Course Outcomes (COs) of Buddhism (minor)**

1. **Understand Core Buddhist Teachings**
2. **Explore Ethical and Philosophical Dimensions**
3. **Study Buddhist Schools and Doctrines**
4. **Examine Buddhist Approaches to Mindfulness and Meditation**
5. **Apply Buddhist Philosophy to Contemporary Issues**

## **Course Outcomes (COs) of Fundamentals of Yoga Philosophy (Skill Enhancement)**

- 1. Understand the Origins and Evolution of Yoga Philosophy**
- 2. Explore the Core Concepts of Yoga**
- 3. Analyse the Ethical Dimensions of Yoga**
- 4. Examine the Interconnection of Mind, Body, and Spirit**
- 5. Apply Yoga Philosophy in Daily Life**

### **Second year (Semester-III)**

#### **Course Outcomes (COs) of Western Philosophy (Major)**

- 1. Understand Key Philosophical Traditions**
- 2. analyse Core Philosophical Concepts**
- 3. Critically Engage with Western Philosophical Debates**
- 4. Draw Comparisons Between Eastern and Western Philosophy**
- 5. Apply Western Philosophy to Contemporary Issues**

#### **Course Outcomes (COs) of Yoga as Holistic Health (Skill Enhancement)**

- 1. Understand the Role of Yoga in Holistic Health**
- 2. Explore the Physiological and Psychological Benefits of Yoga**
- 3. Apply Yoga for Preventive and Curative Health**
- 4. Promote Wellness and Mindfulness**
- 5. Foster Sustainable Living through Yoga Principles**

### **Second year (Semester-IV)**

#### **Course Outcomes (COs) of Logic (Major)**

- 1. Understand the Fundamentals of Logical Reasoning**
- 2. analyse and Evaluate Arguments**
- 3. Study Formal and Informal Logic**
- 4. Enhance Problem-Solving Skills**
- 5. Utilize Logic in Everyday and Philosophical Contexts**

**Course Outcomes (COs) of Yoga Education for Better Living  
(Skill Enhancement)**

- 1. Understand the Principles of Yoga for Life Enhancement**
- 2. Promote Healthy Living through Yoga Practices**
- 3. Develop Life Skills through Yoga**
- 4. Integrate Yoga Ethics for Holistic Development**
- 5. Apply Yoga Education to Contemporary Challenges**

**Third Year**

**Course Outcomes (COs) of Socio-Political Philosophy (Paper-I)**

- 1. Understand the Foundations of Socio-Political Philosophy**
- 2. analyse Philosophical Theories of Society and Politics**
- 3. Examine the Interrelationship between Individual and Society**
- 4. Engage with Contemporary Socio-Political Issues**
- 5. Foster Ethical and Inclusive Leadership**

**Course Outcomes (COs) of Yoga as Applied Philosophy  
(Paper-II A)**

- 1. Understand the Philosophical Foundations of Yoga**
- 2. Apply Yoga for Personal and Professional Growth**
- 3. Promote Holistic Health and Wellness**
- 4. Foster Ethical Living through Yoga Principles**
- 5. Address Contemporary Challenges with Yoga Philosophy**

**Or**

**Course Outcomes (COs) of Logic (Paper-II A)**

- 1. Understand the Fundamentals of Logical Reasoning**
- 2. analyse and Evaluate Arguments**
- 3. Study Formal and Informal Logic**
- 4. Enhance Problem-Solving Skills**
- 5. Utilize Logic in Everyday and Philosophical Contexts**

## अ० प्र० ब० राजकीय स्नातकोत्तर महाविद्यालय अगस्त्यमुनि (रुद्रप्रयाग) हिन्दी विभाग

### स्नातक स्तर:-

#### Programme Outcomes:

साहित्य मानव संवेदना की अभिव्यक्ति का प्रमुख स्रोत रहा है। कलाओं में यह सम्पूर्ण कला है। साहित्य समाज का प्रतिदर्श है। स्नातक उपाधि में हिन्दी विषय के चयन एवं अध्ययन से विद्यार्थी को साहित्य के सांगोपांग महत्व का ज्ञान होता है। इसके द्वारा विद्यार्थी को राष्ट्र की सर्वप्रमुख भाषा के अत्यन्त समृद्ध साहित्य के सम्पूर्ण स्वरूप का ज्ञान होता है। हिन्दी साहित्य की सभी प्रमुख विधाओं का ज्ञान प्राप्त होता है, जिससे उनमें रचनात्मकता का प्रस्फुटन एवं विकास होता है। जीवन के आजीविकोपार्जन सम्बन्धी पक्ष के रूप में हिन्दी के प्रयोजनमूलक स्वरूप एवं महत्व का ज्ञान प्राप्त होता है। साहित्य के अध्ययन में अन्य अनुशासनों के सन्दर्भ यथा - सामाजिक, राजनीतिक, आर्थिक, ऐतिहासिक, पर्यावरणीय आदि समाहित होते हैं। इस प्रकार स्नातक में हिन्दी साहित्य का चयन विद्यार्थी को समग्र रूप से शिक्षित करता है। विद्यार्थी संघ लोक सेवा योग एवं प्रादेशिक लोक सेवा आयोगों की परीक्षा के पाठ्यक्रम में सम्मिलित हिन्दी साहित्य की आधार तथा अनिवार्य शिक्षा प्राप्त करता है।

#### Course Outcomes:

##### स्नातक प्रथम सेमेस्टर प्रथम प्रश्नपत्र – “प्राचीन एवं भक्तिकालीन काव्य” (Core Compulsory)

इस प्रश्नपत्र के अध्ययन से विद्यार्थी हिन्दी साहित्य के आरम्भिक काल की कविता का ऐतिहासिक एवं सैद्धांतिक ज्ञान सोदाहरण प्राप्त करता है। चंदबरदाई, कबीर, जायसी, सूर और तुलसी के कृतित्व को समझने के क्रम में महाकाव्य विधा एवं मुक्तक विधा का शिल्पगत परिचय एवं ज्ञान पाता है। आदिकालीन वीरकाव्य, निर्गुण काव्यधारा एवं संत साहित्य का सैद्धांतिक परिचय एवं ज्ञान सोदाहरण पाता है। इसी के साथ विद्यार्थी सूफी काव्यधारा, सगुण काव्यधारा तथा इनके अंतर्गत रामभक्ति और कृष्णभक्ति के महत्वपूर्ण काव्य का भी सैद्धांतिक परिचय एवं ज्ञान सोदाहरण प्राप्त करता है।

##### स्नातक प्रथम सेमेस्टर द्वितीय प्रश्नपत्र – “सर्जनात्मक लेखन का परिचय” (Vocational / Skill Development Course)

इस प्रश्नपत्र के अध्ययन से विद्यार्थी रचनात्मक लेखन की अवधारणा एवं स्वरूप तथा रूपांतरण की प्रक्रिया से परिचित होता है। साथ ही विविध अभिव्यक्ति क्षेत्र, साहित्य, पत्रकारिता, विज्ञापन, विविध गद्य अभिव्यक्तियाँ तथा लेखन के विविध रूपों का भी परिचय प्राप्त करके विद्यार्थी का रोजगार हेतु कौशल संवर्धन होता है।

##### स्नातक द्वितीय सेमेस्टर प्रथम प्रश्नपत्र – “हिन्दी कथा साहित्य” (Core Compulsory)



इस प्रश्नपत्र के अध्ययन से विद्यार्थी हिन्दी की उपन्यास एवं कथा-परम्परा का परिचय एवं ज्ञान प्राप्त करता है। हिन्दी उपन्यास एवं कहानी के उद्भव एवं विकास का ज्ञान पाता है। इस प्रश्नपत्र में सम्मिलित उपन्यास एवं कहानियों के अध्ययन से उपन्यास एवं कहानी विधा का शिल्पगत ज्ञान पाता है। इसी के साथ विद्यार्थी उपन्यास एवं कथा-साहित्य की समीक्षा का ज्ञान भी प्राप्त करता है।

### **स्नातक द्वितीय सेमेस्टर द्वितीय प्रश्नपत्र – “सूचना तंत्र के लिए सामग्री लेखन” (Vocational / Skill Development Course)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी विभिन्न सामाजिक, राजनैतिक, साहित्यिक, सांस्कृतिक, क्रीड़ा इत्यादि मुद्दों पर इलेक्ट्रानिक मीडिया हेतु सामग्री लेखन की जानकारी प्राप्त करके रोजगार प्राप्त करने में समर्थ हो सकते हैं।

### **स्नातक द्वितीय सेमेस्टर तृतीय प्रश्नपत्र – “हिन्दी भाषा : व्याकरण ” (Minor Elective Paper)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी हिन्दी भाषा के व्यावहारिक प्रयोजनार्थ वर्तनी एवं शब्दों के मानक स्वरूप का ज्ञान एवं प्रशिक्षण पाता है। शुद्ध लेखन हेतु हिन्दी की वाक्य-संरचना एवं व्याकरण का ज्ञान एवं प्रशिक्षण प्राप्त करता है। हिन्दी भाषा की अत्यन्त समृद्ध शब्द सम्पदा तथा उसकी समाहार-समायोजन शक्ति का ज्ञान पाता है। साथ ही विद्यार्थी कार्यालयी प्रयोजनार्थ पारिभाषिक-प्रतिपारिभाषिक शब्दों के प्रयोग का ज्ञान एवं प्रशिक्षण भी प्राप्त करता है।

### **स्नातक तृतीय सेमेस्टर प्रथम प्रश्नपत्र – “रीतिकालीन काव्य” (Core Compulsory)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी हिन्दी साहित्य के तीसरे काल के विषय में ऐतिहासिक एवं सैद्धांतिक ज्ञान सोदाहरण प्राप्त करता है। केशवदास, बिहारी, देव, घनानंद और भूषण की कविताओं के आधार पर रीतिकालीन कविता की कला और शिल्प का ज्ञान प्राप्त करता है। इसी के साथ विद्यार्थी रीतिकालीन काव्य की प्रमुख प्रवृत्तियों से भी परिचित होता है।

### **स्नातक तृतीय सेमेस्टर द्वितीय प्रश्नपत्र – “कार्यालयी हिन्दी” (Vocational / Skill Development Course)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी कार्यालयी हिन्दी के स्वरूप एवं उद्देश्य तथा सामान्य एवं कार्यालयी हिन्दी में अन्तः सम्बन्ध से परिचित होता है। कार्यालयी हिन्दी की पारिभाषिक शब्दावली से परिचित होता है। कार्यालय से निर्गत पत्रों यथा – ज्ञापन, परिपत्र, आदेश, निविदा आदि का ज्ञान प्राप्त करता है। साथ ही प्रारूपण, संक्षेपण, पल्लवन, टिप्पण आदि विविध पक्षों से परिचित होता है, जिससे विद्यार्थी का कार्यालयों में रोजगार हेतु कौशल संवर्धन होता है।

### **स्नातक चतुर्थ सेमेस्टर प्रथम प्रश्नपत्र – “नाटक एवं स्मारक साहित्य” (Core Compulsory)**



इस प्रश्नपत्र के अध्ययन से विद्यार्थी नाटक की भारतीय एवं पाश्चात्य परम्पराओं का ज्ञान प्राप्त करता है। नाटक के स्वरूप एवं प्रकारों का ज्ञान प्राप्त करता है। इस प्रश्नपत्र में सम्मिलित नाटक के अध्ययन के आधार पर नाट्य समीक्षा का ज्ञान प्राप्त करता है। हिन्दी में स्मारक साहित्य लेखन परंपरा का भी ज्ञान प्राप्त करता है। स्मारक साहित्य के स्वरूप एवं उसकी विधाओं का ज्ञान प्राप्त करता है। महान साहित्यकारों के जीवन से जुड़ी घटनाओं को पढ़ने से विद्यार्थी को उच्च जीवन मूल्यों की शिक्षा एवं प्रेरणा प्राप्त होती है।

### **स्नातक चतुर्थ सेमेस्टर द्वितीय प्रश्नपत्र – “रचनात्मक लेखन” (Vocational / Skill Development Course)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी रचनात्मक लेखन की अवधारणा एवं स्वरूप तथा रूपांतरण की प्रक्रिया से परिचित होता है। साथ ही विविध अभिव्यक्ति क्षेत्र, साहित्य, पत्रकारिता, विज्ञापन, विविध गद्य अभिव्यक्तियाँ तथा लेखन के विविध रूपों का भी परिचय प्राप्त करके विद्यार्थी का रोजगार हेतु कौशल संवर्धन होता है।

### **स्नातक चतुर्थ सेमेस्टर तृतीय प्रश्नपत्र – “हिन्दी भाषा : स्वरूप” (Minor Elective Paper)**

इस प्रश्नपत्र के अध्ययन से विद्यार्थी को हिन्दी भाषा के विस्तृत एवं समृद्ध इतिहास का ज्ञान प्राप्त होता है। हिन्दी की शैलियों यथा – हिन्दी, हिन्दुस्तानी व उर्दू का ज्ञान प्राप्त होता है, जो भाषा के व्यावहारिक प्रयोग में काम आता है। हिन्दी की बोलियों का भी ज्ञान प्राप्त होता है, जिसके आधार पर विद्यार्थी अपने भाषा संस्कारों को समृद्ध करता है तथा संपर्क भाषा के रूप में हिन्दी का प्रयोग अधिक कुशलता के साथ कर पाता है। विद्यार्थी को राजभाषा के रूप में हिन्दी की संवैधानिक स्थिति का ज्ञान होता है, जिसकी आवश्यकता उसे सरकारी सेवाओं में होती है। विद्यार्थी विभिन्न व्यावहारिक एवं व्यावसायिक प्रयोजनों हेतु हिन्दी के मानकीकृत रूप का ज्ञान एवं प्रशिक्षण प्राप्त करता है। साथ ही वह कंप्यूटर एवं इन्टरनेट की तकनीक में हिन्दी के प्रयोग का आरंभिक ज्ञान एवं प्रशिक्षण भी प्राप्त कर करता है।

### **स्नातक तृतीय वर्ष प्रथम प्रश्नपत्र – “प्रयोजनमूलक हिन्दी”**

इसका दूसरा नाम कामकाज़ी हिन्दी भी है। विभिन्न सरकारी कार्यालयों में अनिवार्य रूप से इसका प्रयोग होता है। संक्षेपण, प्रारूपण, टिप्पण, पल्लवन, अनुवाद, पत्रकारिता, पारिभाषिक शब्दावली, जनसंचार माध्यमों आदि का अध्ययन इसके अंतर्गत किया जाता है। विभिन्न सरकारी कार्यालयों के विभागों एवं अनुभागों में इससे सम्बन्धित कार्य प्रतिदिन होते हैं। यह रोजगारपरक हिन्दी भी कहलाती है।

### **स्नातक तृतीय वर्ष द्वितीय प्रश्नपत्र – “जनपदीय भाषा साहित्य”**

गढ़वाली एवं कुमाऊँनी साहित्य के उद्भव एवं विकास का अध्ययन करके विद्यार्थी क्षेत्रीय भाषा को गहनता से समझता है। हिन्दी भाषा के साथ ही अपनी क्षेत्रीय भाषा के साहित्य एवं व्याकरण का ज्ञान होना भी साहित्य के



विद्यार्थी के लिए अत्यंत आवश्यक है। लोकगीत, लोककथाएं, लोकगाथाएं हमें उत्तराखंड की सामाजिक, राजनैतिक, धार्मिक एवं आर्थिक परिस्थितियों से परिचित कराकर पहाड़ के जनजीवन एवं मानवीय मूल संवेदनाओं को समझने में सहायक होती हैं।

### स्नातकोत्तर स्तर:-

#### Programme Outcomes:

एम० ए० हिन्दी विषय के अंतर्गत द्वि-वर्षीय पाठ्यक्रम में कुल 18 प्रश्नपत्र सम्मिलित हैं। इन सभी प्रश्नपत्रों का गहन अध्ययन विद्यार्थी के लिए विभिन्न राज्यस्तरीय एवं राष्ट्रीय स्तरीय प्रतियोगी परीक्षाओं में सफल होने में सहायक है। स्नातकोत्तर उपाधि में हिन्दी विषय के चयन एवं अध्ययन से विद्यार्थी को हिन्दी साहित्य के विविध पक्षों का ज्ञान प्राप्त होगा, जिससे वह भाषा तथा साहित्य के उच्चस्तरीय आधारभूत ज्ञान एवं कुशलता के साथ भविष्य में शोध हेतु अग्रसर होगा।

#### Course Outcomes:

##### प्रथम सेमेस्टर

##### प्रथम प्रश्नपत्र- हिन्दी साहित्य का इतिहास (आरम्भ से रीतिकाल तक)

हिन्दी साहित्य के इतिहास के प्रारम्भिक युगों को उनके प्रवृत्तिगत एवं तत्कालीन परिस्थितियों के आधार पर विस्तृत अध्ययन करके विद्यार्थी का साहित्यिक ज्ञान समृद्ध होता है।

##### द्वितीय प्रश्नपत्र- आदिकालीन एवं निर्गुण काव्य

आदिकालीन एवं भक्तिकालीन कवियों के काव्य का अध्ययन करके विद्यार्थियों की काव्य-सृजन क्षमता विकसित होती है।

##### तृतीय प्रश्नपत्र- मध्यकालीन सगुण एवं रीतिकालीन काव्य

भक्तिकालीन एवं रीतिकालीन कवियों के काव्य का अध्ययन करके विद्यार्थियों की काव्य-सृजन क्षमता में वृद्धि होती है।



### चतुर्थ प्रश्नपत्र- हिन्दी साहित्य का इतिहास (भारतेन्दु युग से अब तक)

स्नातकोत्तर स्तर पर युगीन परिस्थितियों एवं प्रवृत्तियों के आधार हिन्दी साहित्य के इतिहास का विस्तृत अध्ययन करके विद्यार्थी का साहित्यिक ज्ञान समृद्ध होता है।

### द्वितीय सेमेस्टर

#### पंचम प्रश्नपत्र- भारतीय काव्यशास्त्र और हिन्दी आलोचना

विभिन्न काव्यशास्त्रीय सिद्धांतों- रस सिद्धांत , अलंकार सिद्धांत , वक्रोक्ति सिद्धांत , ध्वनि सिद्धांत , औचित्य सिद्धांत का अध्ययन करते हुए काव्य को विभिन्न आलोचनात्मक प्रवृत्तियों की कसौटी पर परखने में विद्यार्थी को सहायता मिलती है।

#### षष्ठम प्रश्नपत्र- आधुनिक गद्य (निबन्ध, नाटक एवं अन्य गद्य विधाएं)

विविध विधाओं के साहित्य का अध्ययन विद्यार्थियों में लेखन की अपार संभावनाएं उत्पन्न एवं विकसित करता है।

#### सप्तम प्रश्नपत्र- उपन्यास एवं कथा साहित्य

उपन्यास एवं कहानियाँ हमारे आम जन-जीवन से जुड़ी हुई घटनाओं पर आधारित होती हैं, जो हमें सामाजिक , धार्मिक , राजनैतिक एवं सांस्कृतिक जीवन-मूल्यों को समझने में सहायता प्रदान करती है।

#### अष्टम प्रश्नपत्र- पाश्चात्य काव्यशास्त्र

विभिन्न पाश्चात्य कवियों- प्लेटो , अरस्तू , लौजाइनस , वर्ड्सवर्थ , कॉलरिज , इलियट , रिचर्ड्स आदि के सिद्धांतों का अध्ययन विद्यार्थी को पाश्चात्य लेखन शैली से परिचित करता है तथा पाश्चात्य आलोचनात्मक प्रवृत्तियों के आधार पर काव्य की समीक्षा करने में सहायता प्रदान करता है।

#### नवम प्रश्नपत्र- आधुनिक काव्य (भारतेन्दु युग से उत्तर छायावाद तक)

विभिन्न आधुनिक कवियों ने तत्कालीन परिवेश के आधार पर काव्य में विभिन्न तत्वों को समाहित किया, जिसका अध्ययन करके विद्यार्थी में नवीन एवं मौलिक काव्य-सृजन की क्षमता में वृद्धि होती है।

### तृतीय सेमेस्टर





## दशम प्रश्नपत्र- भाषा विज्ञान एवं हिन्दी भाषा

विद्यार्थियों को भाषा का व्याकरणिक ज्ञान- स्वन , वाक्य , रूपिम , अर्थ विज्ञान की विस्तृत जानकारी प्राप्त होती है ।

## एकादश प्रश्नपत्र- आधुनिक काव्य (छायावादोत्तर हिन्दी कविता)

आधुनिक कवियों के काव्य में वर्तमान परिस्थितियों की झलक विद्यार्थी को वर्तमान यथार्थ से परिचित कराती है। कविता केवल काल्पनिक लोक ही नहीं , अपितु यथार्थ वस्तु जगत से भी बोध कराती है । इस प्रश्नपत्र के द्वारा हिन्दी साहित्य के आधुनिक काव्य की कविताओं के स्वरूप से परिचित होकर विद्यार्थी में काव्य- सृजन की क्षमता का भी विकास होता है ।

## द्वादश प्रश्नपत्र- जयशंकर प्रसाद

छायावाद के चार स्तम्भों में से एक जयशंकर प्रसाद के सम्पूर्ण साहित्य का विस्तृत अध्ययन करके विद्यार्थी विशिष्ट साहित्यिक प्रतिभा को विकसित कर सकता है । प्रेम और सौन्दर्य के कवि जयशंकर प्रसाद के साहित्य में मानवीय संवेदना, प्रकृति-चित्रण , रहस्यवादी अनुभूति , कल्पना प्रवणता , भारतीय जीवन दर्शन की अभिव्यक्ति आदि विशेषताएं सर्वत्र दृष्टिगोचर होती हैं ।

## त्रयोदश प्रश्नपत्र- सूरदास

सूरदास के सम्पूर्ण साहित्य के विस्तृत अध्ययन में वात्सल्य और माधुर्य भावों से युक्त कृष्ण काव्य का चित्रण हृदय में स्वाभाविक आनंद की अभिव्यंजना करता है, साथ ही उनका काव्य एक साथ ही लोक और परलोक को प्रतिबिंबित करता है ।

## चतुर्थ सेमेस्टर

## चतुर्दश प्रश्नपत्र- भाषा विज्ञान और हिन्दी भाषा

भाषा के उद्भव एवं विकास का व्याकरणिक स्तर पर विस्तृत अध्ययन करके विद्यार्थी में विषय विशेष की गहन समझ विकसित होती है ।

## पंचदश प्रश्नपत्र- प्रयोजनमूलक हिन्दी और मीडिया लेखन

हिन्दी केवल साहित्यिक भाषा न होकर राजभाषा (कामकाज़ी हिन्दी) भी है । विभिन्न प्रशासनिक कार्यों , वित्त, वाणिज्य , बैंकिंग , बीमा , व्यापार , विधि , विज्ञापन , संवाद लेखन , पटकथा लेखन , जनसंचार माध्यम, सरकारी पत्राचार ,



पारिभाषिक शब्दावली का निर्माण आदि विभिन्न कार्यों में इसका महत्वपूर्ण योगदान है।

### **षोडश प्रश्नपत्र- गढ़वाली लोक साहित्य**

गढ़वाली लोक साहित्य, लोकगीतों, लोककथाओं, लोकगाथाओं के स्वरूप एवं विशेषताओं के ज्ञानार्जन के माध्यम से विद्यार्थी लोकभाषा, लोक संस्कृति, स्थानीय परम्पराओं और रीति-रिवाज़ों से परिचित होता है।

### **सप्तदश प्रश्नपत्र- जनपदीय भाषा साहित्य (गढ़वाली भाषा साहित्य)**

क्षेत्र विशेष के साहित्य का ज्ञान साहित्य के विद्यार्थी को अवश्य होना चाहिए। विद्यार्थी में क्षेत्रीय भाषा के प्रति रूचि उत्पन्न होने से वह अपने क्षेत्र विशेष की साहित्यिक एवं सांस्कृतिक विरासत को समृद्धिशाली बनाने में सदैव प्रयासरत रहता है।

### **अष्टादश प्रश्नपत्र- मौखिकी**

यह एक प्रकार की परीक्षा है, जिसमें बाह्य परीक्षक द्वारा विद्यार्थी से सम्पूर्ण पाठ्यक्रम में से प्रश्न पूछे जाते हैं और विद्यार्थी को मौखिक रूप से उन प्रश्नों का उत्तर देना होता है। इससे विद्यार्थी में अभिव्यक्ति की क्षमता का विकास होता है।



## Department of Home Science

### Programme outcomes

- Understand the multidisciplinary approach to enhance the quality of life of the individuals, families and communities.
- Develop skills in food, nutrition, diet, textile, apparel designing, human development, housing and resource management.
- Acquired professional and entrepreneurial skills for economic empowerment of self and community.

<b>BA 1st sem course Outcome</b>	
<b>Food and Nutrition</b>	Understand basic concepts of food, nutrition, balance diet.  Describe functions, dietary sources and deficiency of various macro and micro nutrients.  Understand the importance and methods of cooking methods.  Learn about the traditional methods of enhancing nutritional value of food.
<b>Vocational (Food and Bakery Science)</b>	Learn about basic baking process.  Understand the scope and importance of bakery industries.
<b>BA 2nd sem course outcome</b>	
<b>Introduction to clothing and textiles</b>	Learn about textile fibers and their properties.  Understand the process of Yarn construction.
<b>Vocational (Value added products from fruits and vegetables)</b>	Understand basic principles and methods of food preservation and food processing.  Learn types and methods of preserved food items like juice, jam, jelly and pickle.
<b>Minor (Human development)</b>	Explain the need and importance of Human development study.  Understand the concept of growth and development.  Learn about various aspects of development during different stages of life cycle.
<b>BA 3rd sem</b>	

<b>Housing</b>	<p>To gain knowledge about importance, function and types of houses.</p> <p>Understand the principle of house planning.</p> <p>Learn about the financial schemes of home loan.</p>
<b>Vocational (Food standard and quality control)</b>	<p>Learn various aspects to measure food quality.</p> <p>Understand the food laws and standard.</p> <p>Learn about the methods and techniques for assessment of food quality.</p>
<b>BA 4th sem</b>	
<b>Mother craft and human development</b>	<p>Understand the concept of child development and growth pattern.</p> <p>Study about the different aspects of development in infancy and early childhood.</p>
<b>Vocational (Hands on training on Bakery/Food preservation and processing)</b>	<p>Provide training programme to students.</p> <p>To develop the practical aspects on Bakery and food preservation unit.</p> <p>Explore their skills in training.</p>
<b>Minor (Human physiology)</b>	<p>Learn the physical structure of human body.</p> <p>Understand the physiology of human body.</p>
<b>BA 5th sem</b>	
<b>Fabric finishing and laundry</b>	<p>Learn about the basic and special fabric finishes</p> <p>Know about the different techniques of dyeing and printing.</p> <p>Learn the importance of appropriate laundry method.</p>
<b>Resource management</b>	<p>Learn the family resource management as a whole.</p> <p>Understand use and importance of family resources like time, money and energy management.</p> <p>Understand the importance of stages of family life cycle.</p>
<b>BA 6th sem</b>	

<b>Dietetics and therapeutic nutrition</b>	<p>Understand principle of therapeutic diet and special feeding methods during diseases.</p> <p>Learn nutritional requirement and intervention in under and over nutrition.</p> <p>Understand the dietary management in common disorders and diseases.</p>
<b>Family welfare and community education</b>	<p>Prepare students to understand community development.</p> <p>Learn about various family and community welfare programmes.</p> <p>Understand the role of community leader.</p>

# **U.G Geography**

## **Program Specific Outcomes**

- 1 To familiarize the students with the basic map making and reading techniques.**
- 2 To make them understand various aspects of human geography especially races, religion, cultural regions and population.**
- 3 To make the students aware of the theoretical aspects of regional development and planning.**
- 4 To give the students general view and the importance of man and environment relationship.**
- 5 To equip the students with basic understanding of the satellite science and areal photogrammetry.**
- 6 To make the students aware about the physiographic divisions and economic resources of India.**
- 7 To refrain the theoretical knowledge of students of “what, where, why” in geography through field survey.**
- 8 To make them understand various problems and overcome them through proper management, planning and sustainability.**
- 9 To motivate students to understand the disaster risk and to take actions appropriately against such risk with their own will.**

## **P.G Geography programme outcomes**

Programme outcome:

The programme learning outcomes relating to M.A in geography are as follows:

1. Establish the position of geography as a subject and its importance and interrelationship that reiterate and validate the Man Environment relationship.
2. In the course of field survey, students acquire a greater understanding of the socio-economic and cultural dimensions of the populations with greater focus on marginalized section of society.
3. Physical field surveys enable the students to understand the landforms, geomorphic process and associated hazards.
4. Computer-based techniques (RS&GIS) are incorporated in the syllabus which prepares the students for further analytical studies.
5. The students are directed towards problem analysis so that they can design and conduct independent research.
6. The comprehensive syllabus promotes and develops a thorough knowledge o concepts, methods and theory.
7. The Ability Enhancement Course strives to develop communication powers in the student, both written and oral
8. The Dissertations written by the students prepare them to examine social and environmental issues along with the causes, consequences and remedial measures emerging at local and national levels.
9. The syllabus is oriented towards emerging job opportunities and future prospects for the students.
10. Assistance is given to students in preparing for various competitive exams like NET,SET,SSC etc.

**Department of Botany**

**A.P.B. Govt. P.G. College Agastyamuni, Rudraprayag**

**By**

**Dr. P.C. Phondani**

**UG**

**B.Sc. Botany Programme Outcomes (PO)**

1. To communicate knowledge of plant identification, diversity, conservation and use value.
2. Understand scientific terms, concepts, facts, phenomenon and their relationships in plants
3. Develop a scientific attitude in the students to think in an open minded manner and arouse the quality of curiosity & critical thinking in general with special focus on plant science.
4. Skills in collection and interpretation of scientific data, contribute to science in general with special emphasis to plant science.
5. Develops awareness about natural resources, environment and need for its conservation
6. Develops special skills in practical works, experiments, handling of laboratory materials and equipment.
7. To create practical experience to students as part of the course to develop scientific ability to conduct research in the field of their choice and contribute to society.

**B.Sc. BOTANY- COURSE OUTCOME (CO)**

**1. PTERIDOPHYTA, GYMNOSPERMS AND PALAEOBOTANY**

- To be able to identify and classify different pteridophytes and gymnosperms



- Understand the diversity in habits, habitats and organization of various groups of plants.
- To impart an insight into the modern classifications in lower forms of plants.
- Understand the evolutionary trends in Pteridophytes and Gymnosperms.
- Study the anatomical variations in vascular plants.
- To be able to identify and classify fossil specimens
- Understand the significance of Paleobotany and its applications.

## 2. ECOLOGY AND REMOTE SENSING

- -Enable the students to understand the structure and function of the ecosystems.
- Enable the students to understand various kinds of pollution in the environment, their impacts on the ecosystem and their control measures
- Make the students aware about various environmental laws in India and the role of various movements in the protection of nature and natural resources.
- Foster and encourage an attitude of curiosity, appreciation and enquiry of various life forms of plants.
- Acquire knowledge about concepts of remote sensing, sensor and their characteristics.

## 3. ECONOMIC BOTANY AND BIODIVERSITY

- Develop skills to distinguish different types of inflorescence, flowers and fruits based on floral parts, their arrangement and relative position
- Awareness about botanical gardens and collection of germplasms
- Develops an idea of economically important crops with special reference to botanical description and morphology of useful parts
- Familiarize with the ethno botanical value of plants and their applications in pharmacognosy.
- Acquaint the student with the significance of Biodiversity.
- Study of biodiversity in relation to plant diversity, conservation initiatives, protected areas, threat status in relation to climate change, land and forest degradation.
- Make the students aware about the extent of the total biodiversity and the importance of their conservation.

- Help the student to design novel mechanisms for the sustainable utilization of natural resources.

#### **4. PLANT BREEDING AND BIostatISTICS**

- Understands the use and importance of hybrid varieties.
- Understands the methods of plant breeding including introduction, hybridization, acclimatization, polyploidy induction and achievements with reference to crops in India
- Develops skills to emasculate and hybridize a bisexual flower
- Understands and identify a research problem, design experiments, execute the research, analyze the results in qualitative and qualitative manner and bring out statistically relevant results
- Concept, Objectives, applications and various methods of plant breeding.
- To be able to prepare a report in a prescribed format, proper method of citing references using reference management software, preparation of illustrations, tables and graphs.
- To enable the students to have enough numerical skills necessary to carry out research.

**M.Sc. Botany Programme Outcomes (PO)**

- Acquire fundamental knowledge in plant science and to make the student to understand that Botany is an integral part of the human life and developments.
- The fundamentals, principles, practical skills and recent developments in the subject area.
- Inspire and boost interest of the students towards plant sciences as the main subject and understand global issues.
- To create foundation for advanced studies, research and development in Botany.
- Understanding the classification of plants from cryptogams to phanerogams. Identification of the flora within field enhances basics of plants.
- Study of biodiversity in relation to habitat will correlates with climate change, land and forest degradation.
- Application of Botany in agriculture is through study of plant pathology.
- Understand the ultra-structure and function of ecology, cell membranes, cell communications, signalling, genetics, anatomy, taxonomy, and plant physiology and biochemistry.
- To understand the multi functionality of plant cells in production of fine chemicals and their wide spread industrial applications.
- Understands different plant diseases, their causative organisms and control measures.
- Develops skill to prepare different fungicides.

**M.Sc. BOTANY- COURSE OUTCOME (CO)**

**1. PHYCOLOGY AND BRYOLOGY**

- To study the evolutionary importance of Algae as progenitors of land plants
- Understand the unique and general features Algae and Bryophytes and familiarize it
- To study the external morphology, internal structure and reproduction of different types of Algae and Bryophytes

- Realize the application of Phycology in different fields.
- Identifies vegetative and reproductive structures in different types of algae and its classification based on thallus organization, pigments and mode of reproduction.
- Awareness about algae and bryophytes and their economic importance.

## **2. ECOLOGY AND REMOTE SENSING**

- Understand the concept of Ecology and Ecological structure and composition.
- Characteristic of Population, Population regulation and interaction.
- Community characteristics and ecological succession
- Animal interaction, competition, beneficial and antagonistic association.
- Enable the students to understand the structure and function of the ecosystems.
- Acquire knowledge about concepts of remote sensing, sensor and their characteristics.
- Gain skills in image analysis and interpretation in preparing thematic maps.
- Acquire knowledge in basic concepts of photogrammetry and mapping.

## **3. PLANT BREEDING AND BIOSTATISTICS**

- Analyzes the historical evolution of plant breeding, knowing which have been the key scientific and technical advances that have influenced its development or accelerated its results.
- Students know the different plant reproduction systems, how they affect genetic variability and how they condition the strategies and processes of selection and breeding.
- Knows the aim of the genome analysis of certain model plant species and the possibilities offered by their comparison with the genomes of other species of agronomic interest.
- Understands the importance of identifying genes, isolating them, determining their function and controlling their expression.
- Recognize the definition of statistics, its subject and its relation with the other sciences.
- Collect data relating to variable which will be examined and calculate descriptive statistics from these data.

- Interpret data by normal and binomial distribution.
- To enable the students to have enough numerical skills necessary to carry out research

**Year -2023-2024**

## **Department of sociology**

### **1-Program Outcomes-**

Program outcome Sociology learning provides initial knowledge about society. Social life and social interactions. It prepares an individual to social life by inculcating values, morals, and manners. It gives knowledge about communities in which he interacts like rural urban and tribal communities.

### **3- Program Specific Outcomes-**

Sociology seeks to understand all aspects of human social behavior, including the behavior of individuals as well as the social dynamics of small Group, large organizations, commonalities, institution, and entire societies. Sociology provides an intellectual background for students considering careers in the professions or business. An Graduate student of sociology should able to develop:

### **Course Outcomes-**

#### **B.A 1 semester**

#### **MAJOR PAPER- Introductory to sociology.**

The course is intended to introduce the students to a sociological way of thinking. It provides an understanding of the discipline of Sociology and sociological perspective. It also provides foundation for other more detailed and specialized courses in sociology. Students will be able to Define Sociology and demonstrate nature, scope and subject-matter of Sociology. Demonstrate how Sociology differ from and similar to other social sciences and their areas of interdependence. Acquaint themselves with the basic concepts of Sociology like society, community, association, culture, social change, social stratification etc. Know the basic social institutions like family, marriage, kinship in a scientific way. Understand and demonstrate how self develops through various process of interaction. Demonstrate how societal and structural factors influence individual behaviour. Explain social change and the factors affecting social change. Realize the importance of cultural lag to understand social change.

#### **SKILL-BASIC CONCEPT IN WOMEN STUDIES**

Meaning of women studies patriarchy. relation of other Axis of stratification. feminism concept and relevance. relation to other Axis of stratification. Cast, community, and ethnicity.

## **B.A 2<sup>nd</sup> semester -**

### **core paper- Indian social system**

- Social process. Culture and civilization meaning and relation, difference,
- Explore the roots of Indian civilization.
- Social stratification and social differentiation. social control.
- Family, system, kinship system, cast, jajmani system.
- understand the basic concepts in sociology and develop an understanding about macro and micro perspective in sociology.
- Comprehend the various features of Indian society and culture including unity in diversity Indian social structure and understanding rural, urban and tribal india.

### **Vocational skill - Women and Development**

This paper Statistical profile of women in india. issue of labour, health, violence and education, Perspectives on Development women, women politics, women and law.

### **Minor elective - Industrial sociology**

This paper describes the nature and scope of industrial sociology. This paper elaborates changing structure of modern industrial enterprises and principles of organization- Formal and informal.

## **B.A 3<sup>RD</sup> SEMESTER**

### **MAJOR PAPER - INDIAN SOCIAL PROBLEM**

- Identifies the basic concepts and theoretical approaches of social problem.
- Describes the types, objectives and principles of the social problems.
- Explain the social problem Indian society.
- Demonstrate how caste system operates and its importance in Indian society.

## **VOC SKILL- NGO and Development in india**

The NGO sector has emerged as an important player in the domain of development today , particularly in the developing countries, including india. There are different types of NGOs operating in diverse areas for betterment of the life of the people.the course provides a holistic understanding of the NGO sector with a focus on some noted NGOs operating in india.after doing this course students will have abrosd understanding the NGOsector in india and familiarity with skills to conduct filed work and prepare reports related to this sector.

## **SKILL PAPER- WOMEN CULTUR AND MEDIA**

Women and culture,ideology, hegemony,counter culturand altermative. Women writings and gender and oral tradions.women representation of gender in television and cinema,print media.

## **B.A 4<sup>th</sup> sem-**

### **social control**

- Explain the main concepts and propositions of sociological theories of social control. ,.
- this paper is designed to aware the students about the concept of control from sociological lens.
- It help the students to grasp the concepts like social control. self control, socialization maladjustment.

### **Techniques of social Research**

- The course is an introductory course on how research is actually done. with emphasis on formulating research design, methods of data collection, and data analysis, it will provide students with some elementary knowledge on how to conduct both, quantitative and qualitative research.



## **B.A 3<sup>rd</sup> year**

### **1<sup>st</sup> Paper**

#### **Classical and Indian sociological thought**

This course provides an understanding of the different sociological thoughts and the students will be able to - Understand of founding father of sociology like Auguste Comte and his different contributions on thoughts like law of three stages, social statics, social dynamics, cybernetic hierarchy of sciences, positivism. - Understand Herbert The course aims to provide a general introduction to development of sociological thought in and influence of ancient, medieval, western on sociological development in India; pre independence, post independence and contemporary sociological thought in India. In the completion of this course the student will be able to:

- Understand important contributions on Indian social thought from Swami Vivekananda, M.K. Gandhi, Radhakamal Mukherjee, G.S. Ghurye, Louis Dumont.
- Understand structural and functional perspective of M.N. Srinivas, S.C Dube, D. P. Mukherji, A.R. Desai, Ramkrishna Mukherjee.

### **2<sup>nd</sup> Paper**

#### **Rural sociology**

The course explores substantive issues in Rural Sociology. It gives attention to Indian themes. Studying the course students will be able to Define Rural Sociology and demonstrate nature, subject-matter and importance of

- studying Rural Sociology. Understand and analyze social, economic and political aspects of rural society.
- Demonstrate how caste system operates and its importance in rural society.
- Define and demonstrate democratic decentralization of power and importance of
- Panchayati Raj Institution in bringing about changes in rural society. Understand the changes that are taking place in rural society with reference to agrarian
- reforms and rural development program.

# OUTCOME OF SYLLABUS

## DEPARTMENT OF ZOOLOGY

### UG LEVEL (New Education Policy –2020)

#### Animal Physiology and Biochemistry

The outcomes of syllabus such as Physiology and Biochemistry for first semester students may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

- Students will be able to explain the basic concepts and principles of physiology and biochemistry, such as the structure and function of biomolecules, cells, tissues, organs, and systems, and the metabolic pathways and regulatory mechanisms that maintain homeostasis in living organisms.
- Students will be able to apply their knowledge of physiology and biochemistry to solve problems and analyse data related to various aspects of human health and disease, such as nutrition, metabolism, endocrinology, immunology, pharmacology, and genetics.
- Students will be able to perform laboratory experiments and techniques in physiology and biochemistry, such as pH measurement, solution preparation, enzyme kinetics,

spectrophotometry, chromatography, electrophoresis, and PCR, and interpret and report the results using appropriate scientific methods and communication skills.

- Students will be able to demonstrate critical thinking, research, and lifelong learning skills by reviewing and evaluating scientific literature and information sources in physiology and biochemistry, and by engaging in collaborative and independent learning activities.

## Cell Biology and Genetics

- The outcomes of the syllabus Cell Biology and Genetics for the 2nd Sem. students may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:
  - Students will be able to understand the structure and function of cells and their organelles, and the molecular basis of inheritance and gene expression.
  - Students will be able to apply the principles of Mendelian and non-mendelian genetics to analyze patterns of inheritance, variation, and evolution in living organisms.
  - Students will be able to perform laboratory techniques and experiments in cell biology and genetics, such as microscopy,

staining, cell culture, DNA extraction, PCR, gel electrophoresis, and gene mapping.

- Students will be able to demonstrate critical thinking, research, and communication skills by reviewing and evaluating scientific literature and information sources in cell biology and genetics, and by presenting and reporting their findings using appropriate formats and conventions.

## **Molecular Biology, Histology and Toxicology**

The outcomes of the syllabus Molecular Biology, Histology and Toxicology for 3rd semester students may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

Students will be able to understand the molecular mechanisms of gene expression, regulation, and manipulation, and the applications of molecular biology techniques in biotechnology, medicine, and agriculture.

Students will be able to identify the structure and function of different types of cells, tissues, and organs, and the methods of preparation, staining, and observation of histological specimens using microscopy.

Students will be able to describe the sources, effects, and mechanisms of action of various toxic substances on living systems, and the methods of detection, prevention, and treatment of toxicity and poisoning.

Students will be able to perform laboratory experiments and techniques in molecular biology, histology, and toxicology, such as DNA isolation, PCR, gel electrophoresis, tissue processing, histopathology, and toxicological assays.

Students will be able to demonstrate critical thinking, research, and communication skills by reviewing and evaluating scientific literature and information sources in molecular biology, histology, and toxicology, and by presenting and reporting their findings using appropriate formats and conventions.

## **Microbiology and Animal Behaviour**

The outcomes of the syllabus Microbiology and Animal Behaviour for 4th semester students may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

Students will be able to understand the diversity, structure, function, and interactions of microorganisms in various

environments, and the applications of microbiology in biotechnology, medicine, and agriculture.

Students will be able to understand the principles, methods, and theories of animal behaviour, and the evolutionary, ecological, and physiological factors that influence the behaviour of animals in different contexts.

Students will be able to perform laboratory experiments and techniques in microbiology and animal behaviour, such as microbial culture, staining, identification, isolation, and enumeration, and behavioural observation, measurement, and analysis.

Students will be able to demonstrate critical thinking, research, and communication skills by reviewing and evaluating scientific literature and information sources in microbiology and animal behaviour, and by presenting and reporting their findings using appropriate formats and conventions.

### **Public health and hygiene– Skill/Vocational**

The outcomes of skill/vocational syllabus public health and hygiene for future endeavour may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

- Students will be able to understand the importance of sanitation, health, and hygiene for preventing and controlling diseases and promoting well-being.
- Students will be able to apply the principles and practices of public health and hygiene in various settings, such as municipal corporations, trade fairs, public health sanitation, water supply, food safety, waste management, and disaster management.
- Students will be able to perform the duties and responsibilities of a sanitary inspector, such as inspecting, monitoring, reporting, and enforcing the health and hygiene standards and regulations in their assigned areas.
- Students will be able to demonstrate professional skills, knowledge, and employability skills, such as communication, teamwork, problem-solving, research, and lifelong learning, while performing their jobs.

## PG Level

### Specialization in Environmental Science

- The outcomes of syllabus for M.Sc. specialization in environmental science may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

- Students will be able to demonstrate advanced knowledge and understanding of the concepts, principles, and methods of environmental science, such as ecology, biodiversity, climate change, pollution, conservation, and sustainability.
- Students will be able to apply their skills and knowledge to conduct independent research and solve complex environmental problems using appropriate scientific methods, tools, and techniques, such as fieldwork, laboratory analysis, statistical analysis, GIS, and remote sensing.
- Students will be able to communicate effectively and ethically their research findings and recommendations to various audiences, such as peers, experts, policy makers, and the public, using oral, written, and visual formats.
- Students will be able to develop a critical and reflective attitude towards their own learning and professional development, and engage in lifelong learning and continuous improvement of their environmental science competencies.

## **Methods and techniques**

The outcomes of syllabus for M.Sc methods and techniques include molecular biology, biostatistics, ecology may vary depending on the course objectives, content, and assessment methods of different institutions. However, some general outcomes that can be expected are:



- Students will be able to demonstrate advanced knowledge and understanding of the concepts, principles, and methods of molecular biology, biostatistics, and ecology, and their applications in various fields of life sciences.
- Students will be able to apply their skills and knowledge to design, conduct, analyze, and interpret experiments and data using various molecular, statistical, and ecological techniques, such as PCR, gel electrophoresis, DNA sequencing, hypothesis testing, ANOVA, regression, sampling, diversity, and population dynamics.
- Students will be able to communicate effectively and ethically their research findings and recommendations to various audiences, such as peers, experts, policy makers, and the public, using oral, written, and visual formats.
- Students will be able to develop a critical and reflective attitude towards their own learning and professional development, and engage in lifelong learning and continuous improvement of their methods and techniques competencies.

## **Immunology, Genetics, Endocrinology, Developmental Biology and Parasitology**

The outcomes of syllabus for M.Sc. students in immunology, genetics, parasitology, developmental biology, and endocrinology may vary depending on the course objectives,

content, and assessment methods of different institutions. However, some general outcomes that can be expected are:

- Students will be able to demonstrate advanced knowledge and understanding of the concepts, principles, and methods of immunology, genetics, parasitology, developmental biology, and endocrinology, and their applications in various fields of life sciences.
- Students will be able to apply their skills and knowledge to design, conduct, analyze, and interpret experiments and data using various immunological, genetic, parasitological, developmental, and endocrinological techniques, such as ELISA, flow cytometry, PCR, gel electrophoresis, DNA sequencing, parasite culture, microscopy, histology, gene expression, and hormone assays.
- Students will be able to communicate effectively and ethically their research findings and recommendations to various audiences, such as peers, experts, policy makers, and the public, using oral, written, and visual formats.
- Students will be able to develop a critical and reflective attitude towards their own learning and professional development, and engage in lifelong learning and continuous improvement of their immunological, genetic, parasitological, developmental, and endocrinological competencies.

## **Laboratory Skills**

Outcomes of various laboratory skills that students acquire during different types of experiments:

### 1. Immunology Experiments:

- **Skills Gained:** Students learn about the immune system, antibody–antigen interactions, and immune responses.
- **Outcomes:**
  - Understand the principles of immunology.
  - Perform techniques like ELISA (enzyme–linked immunosorbent assay) and Western blotting.
  - Analyze immune responses and interpret results.

### 2. Specimen Identification:

- **Skills Gained:** Students learn to identify and classify various biological specimens.
- **Outcomes:**
  - Develop observational skills.
  - Understand taxonomic classification.
  - Learn to use dichotomous keys and other identification tools.

### 3. Genetic Exercises:

- **Skills Gained:** Students explore genetic concepts and techniques.
- **Outcomes:**
  - Understand Mendelian genetics, inheritance patterns, and genetic variation.
  - Perform genetic crosses (e.g., Punnett squares).
  - Analyze data related to gene expression and inheritance.

#### 4. Microorganism Studies:

- **Skills Gained:** Students work with microorganisms (bacteria, fungi, viruses).
- **Outcomes:**
  - Cultivate and isolate microorganisms.
  - Perform staining techniques (e.g., Gram staining).
  - Understand microbial growth, metabolism, and pathogenesis.

#### 5. Ecological Investigations:

- **Skills Gained:** Students explore ecosystems and interactions between organisms and their environment.
- **Outcomes:**
  - Conduct fieldwork (e.g., sampling, biodiversity assessment).
  - Analyze ecological data.
  - Understand population dynamics, community structure, and ecosystem processes.

#### 6. Molecular Demonstrations:

- **Skills Gained:** Students work with biomolecules (DNA, proteins, enzymes).
- **Outcomes:**
  - Perform DNA extraction, PCR (polymerase chain reaction), and gel electrophoresis.
  - Understand molecular biology techniques.
  - Interpret experimental results.

Thanks

Department of Zoology

Government Post Graduate College Agastyamuni

## ***Outcome Reports (B. A . Political Science )***

### **B.A. Political Science B.A 1<sup>st</sup> Year – 1<sup>st</sup> sem – 1<sup>st</sup> Paper**

#### **Title – Basic concept of political science**

इस पेपर के अंतर्गत छात्रों को राजनीति, राजनीतिक दर्शन व सिद्धांत, राज्य, राष्ट्र, राजनीतिक व्यवस्था, और उनके तत्वों, विभिन्न राजनीतिक सिद्धांतों जैसे सामाजिक सामाजिक समझौता, उदारवाद, समाजवाद, शक्ति, सत्ता, स्वतंत्रता, वैधता, न्याय, कानून, अधिकार, कर्तव्य, लोकतंत्र, प्रतिनिधित्व, भागीदारी, राजनीतिक दल, दबाव समूह, और जनमत जैसे आदि महत्वपूर्ण विषयों के बारे में जानने और समझने का मौका मिलता है। यह सभी उक्त विषय उन पहलुओं की जानकारी देते हैं जो न केवल छात्र के भीतर जिज्ञासा पैदा करती है अपितु आने वाले भविष्य में उसे एक सशक्त नागरिक बनने में सहायता प्रदान करती है और उसकी सोच और समझ को व्यापकता और तार्किकता को विकसित करती है।

### **Political Science B.A 1<sup>st</sup> Year – 1<sup>st</sup> sem – 1<sup>st</sup> Paper**

#### **Title – Awareness of civil Rights**

पेपर के अंतर्गत छात्रों को अधिकार, मौलिक अधिकार, मानव अधिकार, सूचना का अधिकार, जीने एवं शिक्षा का अधिकार, महिला अधिकारों, वंचित वर्गों और साइबर क्राइम के विरुद्ध अधिकारों के बारे में पढ़ाया जाता है। आधुनिक युग में उपरोक्त विषय न केवल छात्र होने के नाते अपितु मानव और नागरिक होने के नाते यह सभी के लिए महत्वपूर्ण हैं। इस विषयों के माध्यम से विद्यार्थी के अंदर छात्र अधिकार बोध की समझ और जागरूकता विकसित होती है जो उसे सशक्त नागरिक बनाने में सहायक होती है।

### **B.A. Political Science B.A 1<sup>st</sup> Year – 2<sup>nd</sup> sem – 1<sup>st</sup> Paper**

#### **Title – Comparative Political system : major constitution of the world**

इस पेपर के अंदर छात्र – छात्राओं को यूनाइटेड किंगडम, अमेरिका, रूस, स्विट्जरलैंड, फ्रांस और ऑस्ट्रेलिया की राजनीतिक व्यवस्था, सरकार के अंगों (कार्यपालिका व्यवस्थापिका न्यायपालिका) शासन प्रणालियों और इन देशों के विभिन्न व्यवस्थाओं के मध्य तुलनात्मक अध्ययन कराया जाता है। जिसके अंतर्गत छात्र इन देशों की व्यवस्था के बारे में जानते हैं। तुलनात्मक अध्ययन के माध्यम से इन देशों के शासन प्रणालियों की अच्छाइयों व कर्मियों के बारे में पढ़ाया जाता है। जिससे उन्हें यह समझने का मौका मिलता है कि दुनिया में किस तरीके की व्यवस्थाएं हैं और हमारे देश में क्या किया जा सकता है और किन प्रावधानों को भारत में बेहतर किए जाने की जरूरत है। इसके प्रति उनके अंदर विचार करने की समझ पैदा होती है।

### **B.A. Political Science B.A 1<sup>st</sup> Year – 3<sup>rd</sup> sem – 1<sup>st</sup> Paper**

#### **Title – Issues of women empowerment**

इस पेपर के अंतर्गत छात्र बेहद संवेदनशील विषय लैंगिक और महिला सशक्तिकरण, महिलाओं से संबंधित संगठन और उनके विकास, विधिक अधिकार, महिला सशक्तिकरण में उद्यमिता वित्त और एनजीओ की भूमिका, महिला सशक्तिकरण में शिक्षा की भूमिका और सरकार की महिलाओं के विकास में क्या-क्या भूमिका है। इन विषयों के बारे में अध्ययन करते हैं इसके अंतर्गत छात्र महिला अधिकारों और समाज में कैसे महिलाओं के जीवन स्तर को बेहतर किया जा सकता है। इसके बारे में उसकी उनकी समझ और जानकारी को बेहतर करती है। जिससे वह भविष्य में समाज और देश में एक बड़ी आबादी को सशक्त करने में अपनी भूमिका निभा सकते हैं।

### **Political Science B.A 1<sup>st</sup> Year – 1<sup>st</sup> sem – 1<sup>st</sup> Paper Title – Indian political system**

इस पेपर के अंतर्गत छात्र – छात्राएं भारतीय संविधान के विभिन्न आयामों के बारे में जानते हैं जिसके अंतर्गत वह प्रस्तावना की मूल भावनाओं से लेकर मौलिक अधिकारों, कर्तव्यों, व्यवस्थापिका, कार्यपालिका, न्यायपालिका से जुड़े विभिन्न आयामों, संघात्मक व्यवस्था, चुनाव व्यवस्था, भारतीय राजनीति में जाति, वर्ग, क्षेत्र से संबंधित मुद्दे और आतंकवाद आदि की विषयों के बारे में जानते हैं। यह विषय छात्रों को संविधान के बारे में जानकारी के साथ उन्हें अपने अधिकारों और कर्तव्यों के प्रति जागरूक करता है। अपितु उनके अंदर विश्वास जगाता है कि देश की समूची व्यवस्था किस प्रकार कार्य करती है।

### **B.A. Political Science B.A 1<sup>st</sup> Year – 5<sup>th</sup> sem – 1<sup>st</sup> Paper**

#### **Title – Major Theories of International Relation**

इस पेपर के अंतर्गत छात्र – छात्राएं अंतरराष्ट्रीय राजनीति के विभिन्न सिद्धांतों, राष्ट्रीय हित, विदेश नीति, राष्ट्रीय शक्ति, संयुक्त राष्ट्र संघ एवं उसके कार्य और प्रासंगिकता एवं क्षेत्रीय संगठन जैसे सार्क, आसियान, यूरोपीय यूनियन आदि विषयों पर अध्ययन करते हैं। जिसके अंतर्गत छात्र न केवल वैश्विक राजनीति में हुए घटनाक्रमों को समझते हैं इतिहास से लेकर वर्तमान में घटित हो रहे अंतरराष्ट्रीय घटनाक्रम के बारे में अपनी समझ को विकसित करते हैं और भविष्य में अंतरराष्ट्रीय परिदृश्य एवं भारत एवं विश्व के राष्ट्रों की क्या रणनीति की संभावना होगी। इसके बारे में अपना विश्लेषणात्मक समझ को विकसित करते हैं।

### **B.A. Political Science B.A 1<sup>st</sup> Year – 5<sup>th</sup> sem – 2<sup>nd</sup> Paper**

#### **Title – Element of public administration**

इस पेपर के अंतर्गत छात्र – छात्राएं लोक प्रशासन के विभिन्न तत्वों को पढ़ते हैं। जिसके अंदर शासकीय नीतियों के विभिन्न पहलुओं का विकास उन पर किस प्रकार अमल किया जाता है, लोक प्रशासन क्या है उसका इतिहास क्या रहा। लोक प्रशासन की संरचना कैसी है; वह किस प्रकार कार्य करती है, नौकरशाही और नागरिक सेवा, बजट एवं कार्यपालिका व्यवस्थापिका न्यायपालिका का प्रशासन पर नियंत्रण और लोकपाल व लोकायुक्त जैसे विषयों के बारे में पढ़ते हैं। जिसके अंतर्गत छात्र न केवल प्रशासन के बारे में जानते हैं अपितु अपनी समझ विकसित करते हैं की प्रशासन किस तरीके से शासन द्वारा बनाई नीतियों को लागू करता है।

### **B.A. Political Science B.A 1<sup>st</sup> Year – 3<sup>rd</sup> sem – 1<sup>nd</sup> Paper**

#### **Title – Foundation of western political thought**

इस विषय के अंतर्गत विभिन्न विचारधाराओं जैसे रूढ़िवादिता, उदारवाद, समाजवाद, नारीवाद और पर्यावरणवाद और पाश्चात्य विचारकों जैसे प्लेटो, अरस्तु, हॉब्स, लॉक, रूसो, बेंथम, जे. एस. मिल, हीगल और कार्ल मार्क्स द्वारा प्रतिपादित सिद्धांतों के बारे में अध्ययन करते हैं जिसके तहत छात्र – छात्राएं न केवल इन विद्वानों के विचारों को जानते हैं अपितु उनके विचारों की वर्तमान में उनकी क्या प्रासंगिकता है, तार्किक आधार पर उनकी समालोचनात्मक समझ विकसित करते हैं।

### **B.A. Political Science B.A 3<sup>rd</sup> Year – 5<sup>th</sup> sem – 1<sup>nd</sup> Paper**

#### **Course Title – Project work**

इस विषय के अंतर्गत विद्यार्थियों को उनकी रुचि के अनुरूप किसी सोध समस्या से अवगत कराया जाता है। इसके अतिरिक्त उन्हें एक निश्चित अवधि में संबंधित विषय पर एक अध्ययन करने हेतु प्रोत्साहित किया जाता है। इस प्रयोजन कार्य का मुख्य उद्देश्य विद्यार्थियों में रचनात्मक एवं विश्लेषणात्मक समझ का विकास करना है। .

### **B.A. Political Science B.A 3<sup>rd</sup> Year – 6<sup>th</sup> sem – 1<sup>nd</sup> Paper**

#### **Course Title – Project work - Contemporary issues in international politics**

सामान्यतः इस विषय के अंतर्गत विद्यार्थियों को अंतरराष्ट्रीय राजनीति की महत्वपूर्ण घटनाओं से अवगत कराया जाता है। इसके अतिरिक्त विद्यार्थियों को विश्व परिदृश्य में उन संस्थाओं, संबंधों, युद्धों, संधियों, संगठनों एवं इनका दुनिया पर पड़ने वाले प्रभाव से रूबरू कराया जाता है। जिसके आधार पर अंतरराष्ट्रीय राजनीति संचालित होती है मूलतः यह विषय विद्यार्थियों में राजनीति की अंतरराष्ट्रीय समझ का विकास करता है।

### **B.A. Political Science B.A 3<sup>rd</sup> Year – 6<sup>th</sup> sem – 2<sup>nd</sup> Paper**

#### **Course Title – Foundation of Indian political thought**

मूलतः इस विषय के अंतर्गत विद्यार्थियों को भारतीय राजनीतिक चिंतकों के विचारों से अवगत कराया जाता है ताकि विद्यार्थियों में भारतीय समाज एवं राजनीति की सामान्य समझ विकसित की जा सके।

### **B.A. Political Science B.A 3<sup>rd</sup> Year – 6<sup>th</sup> sem**

#### **Course Title – Project work (2)**

यह विषय मूलतः विद्यार्थियों में सामाजिक समस्याओं के प्रति जागरूकता व उनका विश्लेषण निर्मित करने हेतु योगदान करता है।

### **B.A. Political Science (Vocational)**

#### **Course Title – Issues of rural development**

सामान्यतः इस विषय के अंतर्गत विद्यार्थियों को ग्रामीण विकास से संबंधित अध्ययन कराया जाता है इसका मूल उद्देश्य विद्यार्थियों में जमीनी स्तर तक विकास की अवधारणा की समझ पैदा करना है।

### **B.A. Political Science (Vocational)**

#### **Course Title – Study of voting pattern and voting behaviour**

इस विषय के अंतर्गत विद्यार्थियों द्वारा भारत में नागरिकों का मतदान व्यवहार क्या है नागरिकों को क्या-क्या मुद्दे चुनाव में प्रभावित करते हैं, के बारे में अध्ययन करते हैं। जो न केवल छात्र-छात्राओं को मतदान के महत्व के बारे में जागरूक करती है अपितु तो मतदान व्यवहार के गुण - अवगुण के प्रति उन्हें एक सशक्त नागरिक बनाने में मदद करती है।

### **B.A. Political Science (Vocational)**

#### **Course Title – Issues of urban government**

इस विषय के अंतर्गत विद्यार्थियों को शहरी विकास से संबंधित मुद्दों पर अध्ययन कराया जाता है। इसका मूल उद्देश्य शहरी जीवन को कैसे सतत बनाए जा सकता है उसके प्रति विद्यार्थियों में एक सामान्य समझ पैदा करना है।

### **B.A. Political Science (Vocational)**

#### **Course Title – Public policy**

इस विषय के अंतर्गत छात्र-छात्राओं को भारत के सरकारी, गैर सरकारी और लोक नीति में महत्वपूर्ण भूमिका निभाने वाले संस्थाओं के बारे में बताया जाता है। जिसके तहत छात्र यह समझ सके कि किस प्रकार देश में लोक नीतियों को बनाया और उसे लागू करके लोगों तक पहुंचाया जाता है।

### **Outcome Report( M . A Political Science)**

#### **M . A Political Science 1<sup>st</sup> Sem Core compulsory course )**

#### **Course Title - Western ancient and medieval political thought**

इसके अंतर्गत छात्र-छात्राओं को प्लेटो , अरस्तु, संत ऑगस्टीन, थॉमस एक्विनास, मर्सिलियो पेडुआ, आदि विचारकों के द्वारा दिए गए सिद्धांतों के बारे में अध्ययन करते हैं जिसके अंतर्गत छात्र उन सिद्धांतों के विभिन्न आयामों का अध्ययन करते हुए वर्तमान परिपेक्ष्य में उनकी प्रासंगिकता को व्यापक रूप से समझने का प्रयास करते हैं।

#### **Course Title - comparative politics**

इस पेपर के अंतर्गत छात्र-छात्राओं को तुलनात्मक राजनीति के सैद्धांतिक आयामों एवं तुलनात्मक विश्लेषणों का अध्ययन कराया जाता है ताकि राजनीति विज्ञान की बेहतर समझ विकसित की जा सके।

#### **Course Title - Indian political system**



सामान्यतः इस विषय के अंतर्गत भारतीय राजनीतिक व्यवस्था के ऐतिहासिक आयामों एवं भारतीय संविधान के प्रक्रियागत नियमों से छात्र-छात्राओं को अवगत कराया जाता है। ताकि भारतीय संविधान के संदर्भ में सैद्धांतिक एवं व्यवहारिक समझ छात्र-छात्राओं में विकसित की जा सके।

#### **Course Title – Local self government**

सामान्यतः इस विषय के अंतर्गत विद्यार्थियों को ग्रामीण पंचायती राज और नगरीय से संबंधित विषयों के बारे में अध्ययन कराया जाता है इसका मूल उद्देश्य विद्यार्थियों में जमीनी स्तर तक लोकतंत्र के विकास की अवधारणा की समझ पैदा करना है।

#### **M. A Political Science 2<sup>nd</sup> Sem Core compulsory course**

#### **Course Title – Modern Political System ( UK, USA, China, France )**

इस पेपर के अंदर छात्र – छात्राओं को यूनाइटेड किंगडम, अमेरिका, चीन और फ्रांस की राजनीतिक व्यवस्था, सरकार के अंगों( कार्यपालिका व्यवस्थापिका न्यायपालिका) शासन प्रणालियों और इन देशों के विभिन्न व्यवस्थाओं के मध्य तुलनात्मक अध्ययन कराया जाता है। जिसके अंतर्गत छात्र इन देशों की व्यवस्था के बारे में जानते हैं। तुलनात्मक अध्ययन के माध्यम से इन देशों के शासन प्रणालियों की अच्छाइयों व कर्मियों के बारे पढ़ाया जाता है। जिससे उन्हें यह समझने का मौका मिलता है की दुनिया में किस तरीके की व्यवस्थाएं है और हमारे देश में क्या किया जा सकता है और किन प्रावधानों को भारत में बेहतर किए जाने की जरूरत है। इसके प्रति उनके अंदर विचार करने की समझ पैदा होती है।

#### **Course Title – Western ancient and medieval political thought**

इसके अंतर्गत छात्र-छात्राओं को प्लेटो, अरस्तु, संत ऑगस्टिन थॉमस एक्विनास मर्सिलियो पेडुआ आदि विचारकों के द्वारा दिए गए सिद्धांतों के बारे में अध्ययन करते हैं जिसके अंतर्गत छात्र उन सिद्धांतों के विभिन्न आयामों का अध्ययन करते हुए वर्तमान परिपेक्ष्य में उनकी प्रासंगिकता को व्यापक रूप से समझने का प्रयास करते हैं।

#### **Course Title - comparative politics**

इस पेपर के अंतर्गत छात्र-छात्राओं को तुलनात्मक राजनीति के सैद्धांतिक आयामों एवं तुलनात्मक विश्लेषणों का अध्ययन कराया जाता है ताकि राजनीति विज्ञान की बेहतर समझ विकसित की जा सके।

#### **Course Title –Indian political system**

सामान्यतः इस विषय के अंतर्गत भारतीय राजनीतिक व्यवस्था के ऐतिहासिक आयामों एवं भारतीय संविधान के प्रक्रियागत नियमों से छात्र-छात्राओं को अवगत कराया जाता है। ताकि भारतीय संविधान के संदर्भ में सैद्धांतिक एवं व्यवहारिक समझ छात्र-छात्राओं में विकसित की जा सके।

#### **( M. A Political Science 3<sup>rd</sup> Sem Core compulsory course )**

#### **Course Title - Indian political thought**

इस विषय के अंतर्गत छात्र-छात्राओं को आधुनिक भारत के प्रमुख राजनीतिक विचारकों जैसे राजा राममोहन राय, गोखले, तिलक, सर सैयद, महात्मा गांधी, वी. डी. सावरकर, जवाहरलाल नेहरू, डॉ बी. आर. अंबेडकर और जे.पी. आदि के बारे में अध्ययन कराया जाता है। ताकि विद्यार्थी भारत के विचारकों के विचार और उनके द्वारा भारत के लिए किए गए कार्यों को जान सके एवं उनसे प्रेरणा ले सके।

#### **Course Title - International relation**

इस विषय के अंतर्गत छात्र-छात्राओं को अंतरराष्ट्रीय राजनीति के अंतर्गत अंतरराष्ट्रीय राजनीति के सिद्धांतों, शक्ति संतुलन, विभिन्न महत्वपूर्ण क्षेत्रीय संगठनों और आतंकवाद जैसे विषयों के बारे में अध्ययन कराया जाता है। इसके तहत छात्र अंतरराष्ट्रीय राजनीति और वैश्विक घटनाक्रमों को जोड़ते हुए अपनी समझ को विकसित करते हैं।

#### **Course Title - Public administration**

इस विषय के अंतर्गत छात्र-छात्राओं को लोक प्रशासन के विभिन्न आयामों का अध्ययन कराया जाता है। जिसका मूल मकसद छात्रों के अंदर लोक प्रशासन की समझ को विकसित करना है। ताकि वह जान सके की लोक प्रशासन की देश के निर्माण में क्या भूमिका है और वह किस प्रकार अपने कार्यों को कार्यान्वित करती है।

### **Course Title - International organisation**

इस विषय के अंतर्गत छात्र-छात्राओं को अंतरराष्ट्रीय संगठनों का अर्थ, महत्व, इतिहास, भूमिका, सफलताएं और विफलताओं के बारे में अध्ययन कराया जाता है। जिससे छात्र-छात्राओं के अंदर ग्लोबल वर्ल्ड में हो रहे परिवर्तन के दौरान अंतरराष्ट्रीय संगठनों की क्या प्रासंगिकता और भूमिका है वह विश्लेषणात्मक समझ विकसित हो सके।

### **Political Science M. A 4<sup>th</sup> sem**

#### **Course Title - Theories of international relations**

इस विषय इसके अंतर्गत छात्र-छात्राओं को अंतरराष्ट्रीय राजनीति के विभिन्न सिद्धांतों, प्रकृति, संभावनाओं, राष्ट्रीय शक्ति, हित और विचारों, विदेश नीति एवं कूटनीति आदि महत्वपूर्ण विषयों का अध्ययन कराया जाता है। ताकि छात्र राष्ट्रीय और अंतरराष्ट्रीय घटनाक्रमों को इतिहास और वर्तमान से जोड़ते हुए अंतरराष्ट्रीय राजनीति और राष्ट्रीय राजनीति की समझ छात्र के अंदर विकसित हो सके।

#### **Course Title - International law**

इस विषय के अंतर्गत छात्र-छात्राओं को अंतरराष्ट्रीय कानून के बारे में अध्ययन कराया जाता है। जिसके अंतर्गत छात्र न केवल अंतरराष्ट्रीय कानून के वैश्विक दुनिया में भूमिका और उसके महत्व को जानते हैं। साथ ही वर्तमान जटिल विश्व में किस प्रकार उनकी भूमिका और वैश्विक दुनिया के सुचारु रूप से संचालन में इन कानूनों का क्या योगदान है, इसके प्रति जागरूक और सजग होते हैं।

#### **Course Title - Political philosophy of Mahatma Gandhi**

इस विषय के अंतर्गत छात्र-छात्राओं को भारत के राष्ट्रपिता महात्मा गांधी के सत्य, अहिंसा, सत्याग्रह और उनकी सामाजिक, आर्थिक, राजनीतिक विचारों को पढ़ते हैं। इससे न केवल छात्र गांधी जी के विभिन्न विचारों से अवगत होते हैं अपितु इस देश के निर्माण में गांधी के विचारों के प्रासंगिकता और उसका क्या महत्व है इसके बारे में अपनी समझ के दायरे को व्यापक और विकसित करते हैं।

#### **Course Title - Human right**

इस विषय के अंतर्गत छात्र-छात्राओं को मानवाधिकार, मानवाधिकारों से संबंधित UN चार्टर, राष्ट्रीय मानवाधिकार आयोग के विभिन्न प्रावधानों, amnesty international, एशिया वॉच और ग्रीन पीस आदि संस्थाओं का अध्ययन करते हैं। जिसके तहत छात्र न केवल अपने मानवाधिकारों के महत्व बारे में जानते हैं अपितु दुनिया में मानवाधिकारों को लेकर क्या-क्या प्रावधान है, किस प्रकार मानवाधिकारों की सुरक्षा के लिए विभिन्न संगठन काम कर रहे हैं, उनकी क्या स्थिति है इसके बारे में जानकारी प्राप्त करते हैं और मानवाधिकार के प्रति अपनी व्यापक समझ को विकसित करते हैं।

## **Subject Outcomes of Department of Mathematics**

**Graduation: Three year degree course.**

### **Algebra**

The concepts and results of Algebra are fundamental to the study of Mathematics and represent a human achievement of great beauty and power.

### **Real Analysis**

Real Analysis is a major course in Mathematics, traditionally viewed as the difficult subject. Beauty and creativity involved in this important area of mathematics is highly appreciable.

### **Differential Equations**

After completing the course, students will be able to formulate and solve differential equations arising from changes in physical world.

### **Mechanics**

The objective of the course is to understand how one can use theory of calculus to determine centre of gravity, velocity and acceleration of a particle along a curve etc.

### **Linear Programming**

After studying course, students will be able to formulate a given simplified description of a suitable real world problem as a linear programming model in general, standard canonical forms.

### **Differential and Integral Calculus**

Upon completion of this course, students will be able to interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function, students also will be able to study, how to differentiate and integrate standard functions.

**Post Graduation: Two year degree course.**

### **Algebra I**

Algebra is a core topic for all discipline that uses higher mathematics and logics. It will help student is becoming sophisticated mathematicians.

### **Real Analysis**

A great deal of the course is intended to immerse the student into the world of formal/abstract mathematics in which formal proofs and definitions are used in abundance.

## **Differential Equation**

The course may be considered to occupy a central position from which different lines of development extend in many directions. The theory of differential equation is an important branch of mathematics and essential for understanding many physical and natural phenomena.

## **Metric Spaces**

Metric spaces are a vital prerequisite for later mathematics courses including Analysis, Topology, Measure Theory, Complex Analysis etc.

## **Topology**

Topology is a modern branch of geometry. The course is designed to develop an understanding of topological ideas and techniques and their role in analysis.

## **Measure and Integration I**

On successful completion of this course, students will understand: How Lebesgue measure on  $\mathbb{R}$  is constructed, the general concept of measure and how measures may be used to construct integrals.

## **Discrete Mathematics**

The primary goal of this course is to provide an introduction to discrete structure for information technology. After studying this course, students will be able to relate computing theory with applications, apply the concepts of Boolean algebra in various areas of Computer Science.

## **Operation Research I**

The problem in Optimisation is the most common applications of mathematics. The main aim of this course is to present different methods of solving Optimisation problem in the area of linear programming, game theory, assignment and transportation problem.

## **Operation Research II**

After completing this course, students will understand how the problems of Economics, Business Management, and other industrial problems may be solved with the help of Inventory Control and Queuing theory.

## **Measure and Integration II**

Investigations in probability theory, partial differential equations, hydromechanics and quantum mechanics often pose problems which require integration over sets. This course gives sufficient answers to such type of problems.

## **Abstract Algebra II**

The main aim to study this course is it to understand a close relationship between the roots of a polynomial and its Galois group.

## **Numerical Analysis**

This course aims to provide students with the techniques for finding approximate numerical solution to the mathematical problems for which exact or analytical solutions are unavailable or inappropriate.

## **Complex Analysis**

This course aims to provide an understanding of the basic facts of complex analysis, in particular the nice properties enjoyed by the derivatives and integrals of function of a complex variable; and to show complex analysis can be used to evaluate real integrals.

## **Mechanics**

Mechanics is the oldest branch of Physics deplanes and is well important in the discipline of Mathematics. It is, in fact a course in Classical Mechanics. Students can understand the applications of fundamental conservation principles to analyze mechanical system.

## **Algebraic Coding Theory**

The objective of the course is to teach the students how to produce algebraic codes based on the methods of groups and finite fields and to make the students familiar with some of the most widely used codes and their applications.

## **Number Theory**

The aim of the course is to give an introduction to elementary number theory, to show how certain number theoretical theorems can be applied to solve simple Diophantine equations.

## **Fluid Dynamics**

Fluids have the ability to transport matters and its properties as well as transmit force; therefore Fluid Dynamics is an important subject that is particularly open to cross fertilisation with other Sciences and disciplines of Engineering.

## **Fuzzy Set Theory**

Upon successful completion of this course, students should be able to understand basic knowledge of Fuzzy sets, fuzzy relations, elements of fuzzy arithmetic and fuzzy logic.

**Fundamental Analysis**

Many of the topics studied in this course have applications on Approximation theory, Operator's theory and other areas of mathematics. At the end of the course, the students will be aware to interplay of algebra and topology.

**Differential Geometry**

Differential Geometry is a mathematical discipline that uses the method of Differential and integral calculus, as well as linear and multi linear algebra, to study problems in Geometry. The theory of plane and space curves and of the surface in the three-dimensional Euclidean space formed the basis for its initial development in the 18th and 19th century.

# अनुसूया प्रसाद बहुगुणा राजकीय स्नातकोत्तर महाविद्यालय अगस्त्यमुनि रुद्रप्रयाग

## संस्कृत विभाग

### Undergraduate courses for Sanskrit programme

### National Education Policy (2020)

#### Program outcomes:-

PO1-साहित्य मानव संवेदना की अभिव्यक्ति का प्रमुख स्रोत रहा है। कलाओं में यह सम्पूर्ण कला है। साहित्य समाज का दर्पण है। स्नातक उपाधि में इस विषय के चयन से विद्यार्थी साहित्य के अध्ययन से तात्कालिक समाज एवं संस्कृति से अवगत होगा।

PO2- सहज एवं स्वाभाविक रूप से भाषा कौशल प्राप्त कर उनमें प्रभावशाली अभिव्यक्ति की क्षमता उत्पन्न होगी।

PO3- आत्मविश्वास से युक्त नेतृत्व क्षमता प्राप्त होगी।

PO4- मूल्यपरक व्यक्तित्व से युक्त होकर भारतीयता के बोध के साथ वैश्विक नागरिक के रूप में भावी चुनौतियों का सामना करने में सक्षम होंगे।

PO5- विद्यार्थी संघ लोकसेवा आयोग एवं प्रादेशिक लोक सेवा आयोगों के परीक्षा पाठ्यक्रम में सम्मिलित संस्कृत साहित्य की आधार एवं अनिवार्य शिक्षा प्राप्त कर सकेंगे।

PO6- विद्यार्थियों को लेखन, वाचन एवं अध्ययन की दृष्टि से भाषागत दक्षता प्राप्त हो सकेगी।

## **Program specific outcomes:-यू.जी. प्रथम वर्ष:-**

- 1) सर्वाधिक वैज्ञानिक भाषा के रूप में संस्कृत भाषा के प्राचीन महत्व एवं उसकी वर्तमान प्रासांगिकता को जानने और समझने योग्य होंगे।
- 2) संस्कृत साहित्य के विभिन्न विषयों तथा नीतिसाहित्य ,व्याकरण, महाकाव्य, छंद, अलंकार एवं नाटक इत्यादि से सुपरिचित होकर संस्कृत विषय का बोध होगा।
- 3) संस्कृत भाषा अध्ययन, सम्भाषण से जीविकोपार्जन के योग्य हो जाएंगे।

## **Course out comes:-**

### **Major course**

### **बी.ए. प्रथम सेमेस्टर:- संस्कृत नीतिसाहित्य एवं व्याकरण**

- 1) विद्यार्थी संस्कृत नीतिसाहित्य से परिचित हो सकेंगे।
- 2) संस्कृत नीतिसाहित्य की संगीतात्मकता का सौंदर्य बोध कर सकेंगे।
- 3) नीति साहित्य में प्रयुक्त नैतिक शिक्षा का बोध कर सकेंगे।
- 4) संस्कृत व्याकरण का सामान्य ज्ञान प्राप्त कर उसकी वैज्ञानिकता से सुपरिचित हो सकेंगे।
- 5) संस्कृत वर्णों के शुद्ध उच्चारण कौशल का विकास होगा।
- 6) स्वर एवं व्यंजन के मूल भेद को समझ कर पृथक अर्थावगमन की क्षमता उत्पन्न होगी।
- 7) स्वर, व्यंजन एवं विसर्ग संधि का विशिष्ट ज्ञान एवं उनके अनुप्रयोग का कौशल विकसित होगा।



## **बी.ए. द्वितीय सेमेस्टर:- संस्कृत महाकाव्य छन्दोऽलंकार एवं नाटक**

- 1) विद्यार्थी संस्कृत साहित्य का सामान्य परिचय प्राप्त कर काव्य के विभिन्न भेदों से परिचित हो सकेंगे।
- 2) संस्कृत महाकाव्य के अध्ययन से उनमें निहित महान चरित्रों का अध्ययन कर आत्मसात करेंगे।
- 3) विद्यार्थी संस्कृत महाकाव्यों में प्रयुक्त रस, छंद, अलंकारों को समझने की क्षमता प्राप्त करेंगे।
- 4) संस्कृत महाकाव्यों में निहित सूक्तियों एवं सुभाषित वाक्यों के माध्यम से विद्यार्थियों का नैतिक एवं चारित्रिक उन्नयन होगा।
- 5) संस्कृत नाटक के अध्ययन से विद्यार्थी संस्कृत नाट्य साहित्य को सामान्य रूप से समझने में सक्षम होंगे।
- 6) नाटक की पारिभाषिक शब्दावली से सुपरिचित होंगे तथा संवाद एवं अभिनय कौशल से पारंगत होंगे।

## **Minor/Elective:-**

### **बीए प्रथम/द्वितीय सेमेस्टर- संस्कृत भाषा अध्ययन**

- 1) संस्कृत भाषा का अध्ययन करने से विद्यार्थियों में रुचि उत्पन्न हो सकेगी।
- 2) संस्कृत भाषा को स्नातक-कला वर्ग के अतिरिक्त वाणिज्य एवं विज्ञान वर्ग के विद्यार्थी भी पढ़ सकते हैं।

3) संस्कृत भाषा के ज्ञान से नैतिक मूल्यों, आध्यात्मिक मूल्यों से युक्त ग्रंथों के अध्ययन में सुगमता प्राप्त होगी। मूल्यपरक ग्रंथों के बोध से अपने जीवन का लक्ष्य पूर्ण करने में समर्थ होंगे।

4) संस्कृत भाषा के अध्ययन से विद्यार्थी अन्य भाषाओं के स्रोत को सरलता से समझ सकते हैं।

5) संस्कृत संभाषण से विद्यार्थी की वाक्शक्ति का विकास होगा।

### **Vocational/skill Development minor course:-**

#### **बीए प्रथम/तृतीय सेमेस्टर- नित्यनैमित्तिक अनुष्ठान**

- 1) विद्यार्थी भारतीय पारंपरिक कर्म काण्ड एवं सांस्कृतिक मूल्यों से परिचित होंगे।
- 2) नित्यनैमित्तिक अनुष्ठान विधि को जान कर जीवन को नियमबद्ध एवं आचरणशील बनाने में सक्षम होंगे।
- 3) भारतीय कर्मकाण्ड के प्रमाणिक शास्त्रीय रूप से परिचित होकर उसकी व्यवहारिक उपयोगिता जानने योग्य बनेंगे।
- 4) सामान्य अनुष्ठान संपन्न कराने योग्य कुशल और पौरोहित्य कर्म विशारद बनेंगे।
- 5) आत्मनिर्भर भारत की संकल्पना को साकार करने में सक्षम और आत्मनिर्भर बनेंगे।

#### **बीए द्वितीय/चतुर्थ सेमेस्टर- ज्योतिष शास्त्र के मूलभूत सिद्धांत:-**

- 1) भारतीय प्राचीन ज्ञान के प्रति रुचि उत्पन्न होगी।
- 2) भारतीय ज्योतिष शास्त्र का सामान्य ज्ञान प्राप्त कर सकेंगे।
- 3) ज्योतिष के विभिन्न सिद्धांतों के माध्यम से विश्लेषण क्षमता जागृत होगी।

4) पंचांग अवलोकन एवं निर्माण कौशल का विकास होगा।

### **Major course –**

**बीए तृतीय सेमेस्टर-संस्कृत साहित्य, भारतीय संस्कृति एवं व्याकरण**

#### **Course outcomes -**

- 1) विद्यार्थी संस्कृत साहित्य का सामान्य परिचय प्राप्त कर काव्य रचनाओं से परिचित हो सकेंगे।
- 2) भारतीय संस्कृति के अध्ययन से विद्यार्थी संस्कृति की विशेषताओं से परिचित होंगे जिससे उनका नैतिक एवं चारित्रिक उत्कर्ष होगा।
- 3) भारतीय सांस्कृतिक तत्वों एवं मूल्यों को आत्मसात् कर भारतीयता के गर्व बोध से युक्त उत्तम नागरिक बनेंगे।
- 4) संस्कृत व्याकरण का ज्ञान प्राप्त कर इसकी वैज्ञानिकता से सुपरिचित हो सकेंगे।

**बीए चतुर्थ सेमेस्टर- संस्कृत साहित्य, साहित्यकार परिचय एवं निबंध**

#### **Course outcomes-**

- 1) विद्यार्थी संस्कृत साहित्य का सामान्य ज्ञान प्राप्त कर पद्यसाहित्य एवं गद्यसाहित्य से सुपरिचित हो सकेंगे।
- 2) संबंधित साहित्य के अध्ययन से पद्यसाहित्य की सुगीतात्मकता का सौंदर्य बोध कर सकेंगे।
- 3) संबंधित साहित्य के माध्यम से उनका नैतिक एवं चारित्रिक उत्कर्ष होगा।

4) प्राचीन एवं अर्वाचीन संस्कृत साहित्यकारों के अध्ययन से प्रेरणा प्राप्त कर सकेंगे।

5) विद्यार्थियों में निबंध एवं अनुच्छेद लेखन क्षमता का विकास होगा।

### **Minor course-**

### **बीए तृतीय/चतुर्थ सेमेस्टर- श्रीमद्भागवद्गीता का अध्ययन**

### **Course outcomes-**

- 1) विद्यार्थी श्रीमद्भागवद्गीता के अंतर्गत प्रतिपाद्य विषय से अवगत हो सकेंगे।
- 2) श्रीमद्भागवद्गीता के माध्यम से कर्मसिद्धांत एवं आध्यात्मज्ञान प्राप्त कर सकेंगे।
- 3) मानव जीवन में ज्ञान के महत्व को आत्मसात करने में सक्षम होंगे।
- 4) विद्यार्थी आत्मप्रबंधन के क्षेत्र में दक्षता प्राप्त कर सकेंगे।

अनुसूया प्रसाद बहुगुणा राजकीय स्नातकोत्तर महाविद्यालय अगस्त्य मुनि रुद्रप्रयाग  
संस्कृत विभाग

Sanskrit subject Program outcome 2023- 2024

बीए तृतीय वर्ष

प्रथम प्रश्न पत्र-काव्यलोचन, योग, आयुर्वेद तथा वास्तुविज्ञान

विश्वनाथ की रचना साहित्य दर्पण के अध्ययन से काव्य का लक्षण, काव्य का प्रयोजन आदि का ज्ञान प्राप्त होता है। पतंजलि के योगसूत्र के अध्ययन से विद्यार्थियों को योग का अर्थ और प्रयोजन, योग के भेदों तथा समाधि आदि के विषय में ज्ञान प्राप्त होता है। योग के महत्व के विषय में जानकारी प्राप्त होती है। चरक संहिता के षड् ऋतुचार्य मात्रा के अध्ययन से विद्यार्थियों को 6 ऋतुओं में किस प्रकार का आहार-विहार करना चाहिए यह जानकारी प्राप्त होती है। वास्तुसौख्यम् के अध्ययन से वास्तु विज्ञान का परिचय मिलता है।

द्वितीय प्रश्न पत्र-उत्तराखंड का अर्वाचीन संस्कृत साहित्य, भारतीय संस्कृति एवं निबंध

उत्तराखंड के आधुनिक लेखन के पद काव्य, खंडकाव्य नाटकों का परिचय प्राप्त होता है, जिससे विद्यार्थियों को स्वयं काव्य रचना करने की प्रेरणा मिलती है। भारतीय संस्कृति का स्वरूप विशेषताएं पंच महायज्ञ, वर्ण व्यवस्था, आश्रम व्यवस्था, 16 संस्कार आदि के विषय में ज्ञान प्राप्त होता है संस्कृत के निबंध को पढ़ने व लिखने से विद्यार्थी में भाषा कौशल का विकास होता है।

स्नातकोत्तरस्तर- एम.ए. संस्कृत विषय के अंतर्गत द्विवर्षीय पाठ्यक्रम में 16 प्रश्न पत्र हैं।

एम.ए. प्रथम सेमेस्टर

प्रथम प्रश्न पत्र-वैदिक सूक्त तथा निरुक्त

विद्यार्थी वैदिक मंत्रों का पाठ करने में सक्षम होते हैं। विद्यार्थियों को इंद्र, सावितृ, रुद्रा, उषस् आदि वैदिक देवताओं का परिचय प्राप्त होता है। नासदीयसूक्त का अध्ययन कर सृष्टि उत्पत्ति के विषय में ज्ञान प्राप्त होता है। मास्क के निरुक्त से वैदिक शब्दों का अर्थ ज्ञान व वैदिक शब्दों की व्युत्पत्ति के विषय में ज्ञान प्राप्त होता है।

द्वितीय प्रश्न पत्र-नाटक एवं नाट्य साहित्य का इतिहास

नाटक एवं नाट्य साहित्य का अध्ययन कर विद्यार्थी में नाटक कौशल का विकास होता है भवभूति के प्रसिद्ध नाटक उत्तररामचरितम् के पाठ से विद्यार्थियों में नैतिक सामाजिक, सांस्कृतिक, मूल्यों और सिद्धांतों का समावेश होता है। संस्कृत साहित्य के विभिन्न नाटक का परिचय प्राप्त होता है।

तृतीय प्रश्न पत्र-भारतीय दर्शन

भारतीय दर्शन संस्कृत के मूल सिद्धांतों का प्रतिपादन करते हैं। विद्यार्थी भारतीय दर्शन के इतिहास से परिचित होता है। तर्क भाषा में वर्णित सप्तपदार्थ द्वय, गुण प्रमाण आदि और संख्यकारिका में वर्णित 25 तत्त्वों का परिचय प्राप्त कर विद्यार्थी अपनी तार्किक आलोचनात्मक और विश्लेषणात्मक शक्ति का विकास करता है।

चतुर्थ प्रश्न पत्र-व्याकरण एवं अनुवाद

विद्यार्थी संस्कृत व्याकरण के उन्नत और वैज्ञानिकता का ज्ञान प्राप्त करता है समास व स्त्री प्रत्यय आदि का ज्ञान प्राप्त करता है और अनुवाद के माध्यम से संस्कृत भाषा पर अपनी पकड़ को मजबूत करता है।

एम.ए. द्वितीय सेमेस्टर

पंचम प्रश्न पत्र-महाकाव्य

विद्यार्थी संस्कृत महाकाव्य की विशेषताओं का अध्ययन करता है। कालिदास के रघुवंशम् और श्री हर्ष के नैषधीयचरितम् का पाठ कर विद्यार्थियों को तात्कालिक, भौगोलिक स्थिति की जानकारी होती है, साथ ही प्राचीन संस्कृति का ज्ञान होता है। महाकाव्य के लक्षण का ज्ञान होने से विद्यार्थी स्वयं काव्य सृजन में सक्षम होता है।

षष्ठ प्रश्न पत्र-धर्मशास्त्र

विद्यार्थी मनुस्मृति और याज्ञवल्क्यस्मृति में वर्णित सृष्टि उत्पत्ति वर्ण व्यवस्था, आश्रम व्यवस्था आदि और धर्म के वास्तविक स्वरूप का ज्ञान प्राप्त करता है, जिससे उसे अपने जीवन में वास्तविक धर्म व मानवीय कर्तव्य का पालन करने की प्रेरणा मिलती है। धर्मशास्त्र के पाठ से विद्यार्थियों में न केवल बौद्धिक अपितु व्यवहारिक ज्ञान की भी वृद्धि होती है।

सप्तम प्रश्न पत्र-पुराणेतिहास

वाल्मीकि रामायण और भागवत पुराण के अध्ययन करने से विद्यार्थी को उस काल की सामाजिक, सांस्कृतिक और राजनीतिक स्थिति के संदर्भ में ज्ञान प्राप्त होता है। रामायण के अध्ययन के माध्यम से विद्यार्थी आधुनिक काल में भी वांछित आदर्शों को प्राप्त करते हैं। और पुराणों की विशेषताओं का ज्ञान प्राप्त करते हैं, तथा भारतीय सांस्कृतिक विरासत के मूल स्रोत को जानते हैं, जिससे उनमें गौरवशाली सांस्कृतिक विरासत के प्रति आदर भाव जागृत होता है।

अष्टम प्रश्न पत्र-काव्यशास्त्र

विद्यार्थी को काव्यशास्त्र के अध्ययन से काव्य का प्रयोजन, काव्य का लक्षण, काव्य के हेतु, काव्य के प्रकार तथा रस, छंद, अलंकार आदि का गूण ज्ञान प्राप्त होता है, और काव्यशास्त्र के इतिहास के अध्ययन से विभिन्न काव्यशास्त्रियों मम्मट, विश्वनाथ, भामह, दंडी और आनंद वर्धन आदि विद्वानों का परिचय प्राप्त होता है। काव्यशास्त्र के सिद्धांतों का अध्ययन करने से विद्यार्थी को विभिन्न काव्य को आलोचनात्मक प्रवृत्तियों की कसौटी पर परखने की सहायता मिलती है।

एम.ए. तृतीय सेमेस्टर

नवम प्रश्न पत्र-गद्यकाव्य

गद्य साहित्य का इतिहास का पाठ करने से विद्यार्थियों को गद्य साहित्य की विशेषताओं और विद्वान गद्य लेखकों का परिचय प्राप्त होता है। कादंबरी की कथा का अध्ययन करने से विद्यार्थियों को तात्कालिक सांस्कृतिक और भौगोलिक स्थिति का ज्ञान होता है। शुकनाश के उपदेशों से विद्यार्थियों में मानवीय गुणा का समावेश होता है।

दशम प्रश्न पत्र-भारतीय संस्कृति तथा निबंध

विद्यार्थियों में भारतीय संस्कृति के प्रति आदर भाव उत्पन्न होता है, और वह वर्णव्यवस्था, आश्रमव्यवस्था, पुरुषार्थ, संस्कार और पंच महायज्ञ के वास्तविक महत्व को जानकर वर्तमान में उसकी प्रासंगिकता को देखते हैं विद्यार्थी को संस्कृत में निबंध लिखने का कौशल प्राप्त होता है।

एकादश प्रश्न पत्र-भाषाविज्ञान

भाषा विज्ञान भाषा के अध्ययन की वह शाखा है जिसमें भाषा की उत्पत्ति स्वरूप विकास आदि का वैज्ञानिक और विश्लेषणात्मक अध्ययन किया जाता है और विद्यार्थी इसका अध्ययन कर राष्ट्रीय एवं अंतर्राष्ट्रीय देशी- विदेशी विकसित-अविकसित सभी प्रकार की भाषाओं से परिचित होता है तथा शब्द और अर्थ की वैज्ञानिकता को जानता है।

द्वादश प्रश्न पत्र-अर्वाचीन संस्कृत साहित्य

विद्यार्थी आधुनिक संस्कृत साहित्य का परिचय प्राप्त करता है जिससे उसमें प्राचीन व अर्वाचीन साहित्य की तुलना करने का कौशल बढ़ता है अर्वाचीन संस्कृत साहित्यकारों का परिचय प्राप्त कर उनमें भी संस्कृत रचना करने के विचार उत्पन्न होते हैं।

एम. ए. चतुर्थ सेमेस्टर

त्रयोदश प्रश्न पत्र-गद्य काव्य तथा चम्पू

विद्यार्थी आचार्य दंडी और उनकी रचना दशकुमारचरितम् का परिचय प्राप्त करते हैं। त्रिविक्रमभट्ट के नल चंपू काव्य का अध्ययन करते हैं। चंपू काव्य का परिचय प्राप्त करते हैं। गद्य साहित्य की विशेषताओं का अध्ययन करते हैं।

चतुर्दश प्रश्न पत्र-नाट्य एवं नाट्यशास्त्र

नाट्यशास्त्र के अध्ययन से विद्यार्थी को संस्कृत नाट्य परंपरा की प्रकृति और विशेषताओं का ज्ञान प्राप्त होता है। धनंजय के दशरूपक के पाठ से विद्यार्थी को नाटक अर्थात् रूपक के दश प्रकार, वस्तु, नेता और रस का ज्ञान प्राप्त होता है। जिससे विद्यार्थियों में नाटकों का मूल्यांकन करने का कौशल बढ़ता है और वह स्वयं भी नाटक का सृजन कर सकता है।

पंचदश प्रश्न पत्र-साहित्यशास्त्र

आनंद वर्धन की रचना ध्वन्यालोक का अध्ययन कर विद्यार्थी ध्वनि सिद्धांत को भली भांति जान पता है। विद्यार्थी पंडित राज जगन्नाथ की रचना रसगंगाधर का अध्ययन कर रस स्वरूप, भावध्वनि, गुणगौरव, शब्द शक्ति तथा काव्य अलंकारों का ज्ञान प्राप्त करता है जिससे उसमें काव्य सृजन की क्षमता बढ़ती है।

षोडश प्रश्न पत्र-मौखिकी

यह एक प्रकार की परीक्षा है, जिसमें परीक्षक द्वारा विद्यार्थी से संपूर्ण पाठ्यक्रम में से प्रश्न किए जाते हैं और विद्यार्थी मौखिक रूप से उन प्रश्नों का उत्तर देता है, इससे विद्यार्थी में अपने विचारों को अभिव्यक्त करने की क्षमता का विकास होता है। जिससे उसका आत्मविश्वास बढ़ता है।

**PROGRAM OUTCOMES, COURSE OUTCOMES**

**(FOR THE ACADEMIC YEAR 2023-24)**

**BACHLOR OF COMMERCE (B.COM)**

<b>Program Outcome</b>	After completing graduation, student will gain knowledge in the area of commerce, economics, finance, marketing, business, auditing, accounting and Entrepreneurship etc. Capability of the student to make decisions at personal and professional level will improve after completion of graduation. Students will be able to prove their efficiency in competitive exams like CA, CS, ICWA and other courses and able to go for higher education and research in the field of Marketing and Finance. The placement options open up to them such as- cost accountant, management accountant, teacher, professor stock agent, bank manager, auditor etc.
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**B. Com I Sem**

<b>Course</b>	<b>Outcomes</b>
Financial Accounting	Student will get conceptual knowledge of financial accounting and applying both quantitative and qualitative knowledge to their future careers in business.
Business Regulatory Framework	Students acquire a brief knowledge about the framework of Indian Contract Act, 1872 and will be able to understand various important laws pertaining to functioning of Business in India.
Business Organization and Management	The student will be able to understand the concept of Business Organization along with the basic laws and norms of Business Organization also acquire the knowledge about Principles & functions of Management, Process of decision making, and Modern trends in management process.
Fundamentals of Digital Marketing	After studying this course Students will learn the basics of digital marketing, how to connect with people online, and measure the success of their efforts."



### B. Com II Sem

Course	Outcomes
Basic Business Finance	The students will be able to understand basic concepts of financial management and their application in investment, financing and dividend decisions.
Business Statistics	The student will develop the ability to analyze and interpret statistical data to provide meaningful information and make informed decisions based on statistical insights.
Entrepreneurship and Small Business	The purpose of this paper is to motivate the students to make their mind set towards entrepreneurship as a career option, develop entrepreneurship skill. Students will be able to apply these skills in the context of both new ventures as well as in established companies.
Content Marketing	After completing this course, the students will learn the basics of content marketing, how to create valuable content, and attract and engage the right audience effectively."
Inventory Management	After completing this course, a student will have ability to understand the concept of Inventory Management and identify the appropriate method and techniques of inventory management for solving different problems.

### B. Com III Sem

Course	Outcomes
Cost Accounting	The student will be able to understand various aspects of cost ascertainment using various costing method and its determinants and advise the management to maximize its profits and used to streamline manufacturing operations.
Company Law	Students will learn the basics of company law, understand legal provisions for companies, and apply them to ensure compliance and governance.

Business Economics	The students will learn the basics of business economics, understand economic principles, and apply them to business decision-making.
Fundamentals of Computer	Acquire the basic knowledge of computer and to enhance the student understanding of usefulness of information technology tools for business operations.

### B. Com IV Sem

Course	Outcomes
Income Tax Law and Accounts	The students can understand the various rules and provisions of Income tax under five heads of income, computation of income tax an individual. Gain practical knowledge in tax liability of an individual and the filing of Income tax return.
Public Finance	Students will learn the basics of public finance, understand government budgeting, taxation, and expenditure, and analyze their impact on the economy.
Fundamentals of Marketing	Students will be able to understand of basic concepts of marketing, marketing mix, segmentation, targeting and positioning. Get clear knowledge about pricing strategies channels of distribution etc.
E- Banking	Students will learn the basics of e-banking, understand online banking services, and explore how digital platforms are transforming banking operations.
Office Management and Secretarial Practice	"Students will learn the fundamentals of office management, understand secretarial roles, and develop skills for efficient office administration and communication.

**B Com III Year**

<b>Group- I</b>	<b>Management Group</b>	
	Marketing Management	Students will be able to develop understanding of basic concepts of marketing, marketing philosophies and environmental conditions effecting marketing decisions of a firm.
	Management Accounting	The students acquire the knowledge of concept, methods and techniques of management accounting for the purpose of managerial planning, control and decision making.
<b>Group- II</b>	<b>Accounting Group</b>	
	Income Tax Law and Accounts	Students will learn the fundamentals of income tax law, understand tax regulations, and gain skills to prepare and manage tax-related accounts.
	Auditing and Corporate Governance	The student will be understanding fundamental concepts of Auditing and corporate governance and help to understand the right and wrong things in organization.
<b>Group- III</b>	<b>Business Economics and Legal Aspects of Business</b>	
	Goods and Service Tax (GST)	Students will learn the fundamentals of Goods and Services Tax (GST), understand its implementation, and gain skills to apply GST in business transactions and compliance.
	Fundamental of Investment	Students will learn the basics of investment, understand different investment options, and develop skills to make informed investment decisions for wealth creation.
<b>Group- V</b>	<b>Communication Group</b>	
	Business Communication	Students will learn the basics of business communication, understand effective communication strategies, and develop skills to convey information clearly in professional settings.
	Business Communication (Viva- voce)	Student will be enhancing their presentation and communication skill also they learn to develop their personality, so that they can face the challenges of competitive world.



## **Program Outcomes, Program Specific Outcomes & Course outcomes**

### **1. DEPARTMENT OF PHYSICS**

**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.

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

Students having Degree in B.Sc. (with Physics) should have knowledge of different concepts and fundamentals of Physics and ability to apply this knowledge in various fields of academics and industry. They may pursue their future career in the field of academics, research and industry.

PO 1 1. Competence in the methods and techniques of calculations using Mechanics.

2. Students are expected to have hands-on experience to apply the theoretical knowledge to solve practical problems.

PO2 1. Students are expected to have deep understanding of electricity and magnetism.

2. Student should be able to make basic electrical circuits and handle electrical instruments.

PO 3 1. Competence in the concepts of Thermodynamics and Statistical Physics.

2. Students are expected to have hands on experience in Thermal and Statistical Physics Experiments.

PO 4 1 Knowledge of different concepts in Geometrical and Physical Optics.

2 Students are expected to have hands on experience of Experiments of Geometrical and Physical Optics.

PO 5 1. Knowledge of basic concepts of solid state physics with their applications.

2. Students are expected to have an insight in handling in solid state and basic electronic instruments.

PO 6 1. Comprehensive knowledge of modern physics, elementary quantum mechanics, Analog & Digital electronics and their Applications.

2. Learn the integrated approach to analog electronic circuitry and digital electronics for R&D.

### **Programme specific outcomes (PSOs):**

#### **UG I Year / Certificate course in Basic Physics**

After completing this certificate course, the student should have

- Acquired the basic knowledge of Mechanics, Electricity and Magnetism.
- Hands-on experience to apply the theoretical knowledge to solve practical problems of basic physical phenomena. He should be able to carry out experiments to understand the laws and concepts of Physics.
- An insight in understanding electrical circuits and in handling electrical instruments.

### **Programme specific outcomes (PSOs):**

#### **UG II Year/ (Diploma in Applied Physics)**

After completing this diploma course, the student should have

- Knowledge of different concepts in Thermodynamics, statistical physics, Geometrical and Physical Optics.
- Knowledge of different aspects of Thermal Physics and Statistical Mechanics which serves as a basis for many physical systems used in industrial applications and deals with the physics and technology of Engines and Refrigerators.
- A deeper insight in Ray Optics to understand the Physics of many optical instruments which are widely used in research and Industry, Optoelectronics, IT and communication devices, and in industrial instrumentation.
- Knowledge of basic concepts of optical instruments with their applications in technology.

### **Programme specific outcomes (PSOs):**

#### **UG III Year / Bachelor of Science**

After completing this degree course, the student should have:

PSO 1 Knowledge of Mechanics and basic properties of matter. The course will empower him to apply his theoretical knowledge in various physical phenomena that occur in day to day life and he can use this scientific knowledge for the betterment of the society.

PSO2 Understanding of basic concepts related to Electricity and Magnetism .He should be proficient in designing and handling different electrical circuits

PSO3 Expertise in different aspects of Thermal and Statistical Physics which serves as a basis for many physical systems used in industrial applications and deals with the physics and technology of Engines and Refrigerators.

Proficient in the field of Optics which will increase his demand in research and industrial establishments engaged in activities involving optical instruments.

PSO4 Proficient in the field of Solid State Physics which will increase his demand in R & D.

PSO5 Basic knowledge in the field of Modern physics and Quantum Mechanics which have utmost importance at both undergraduate and graduate level.

PSO6 Comprehensive knowledge of Basic Electronics, Analog & Digital Principles and their Applications.

Learn the integrated approach to analog electronic circuitry and digital electronics for R&D.

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

## B.Sc. 1<sup>st</sup> Semester

### **Mechanics**

Vector algebra. Scalar and vector products, scalar and vector triple products, Derivative of a vector with respect to a parameter, Del operator, gradient, divergence and curl, Gauss divergence theorem, Stokes curl theorem and Green's theorem, Line, surface and volume integral of a vector function. Gravitational field and potential, Gravitational potential energy, Gravitational field Intensity and potential due to a ring, a spherical shell, solid sphere and circular disc, gravitational self-energy, Inverse square law of forces, Kepler's laws of planetary motion.

Frames of reference, Concept of inertial and Non-inertial frames of references, Work energy theorem, Conservative and non-Conservative forces, Linear restoring force, Gradient of potential, Conservation of energy for the particle; Energy function, Concept of Centre of mass, Angular momentum and torque, Laws of conservation of total energy, total linear momentum and total angular momentum along with their examples.

Translatory and Rotatory motion, Equation of motion for Rotating rigid body, angular momentum vector and moment of inertia, Theorem of parallel and perpendicular axes, Moment of inertia of a cylinder, rod, lamina, ring, disc, spherical shell, solid sphere, kinetic energy of rotation, rolling along a slope, Application to compound pendulum.

Basic concept, Elastic constants and their Interrelations, torsion of cylinder, bending of beam, bending moment, Cantilever, shape of Girders/ rail tracks. Viscosity, Stokes's law, Poiseuille's formula, Equation of continuity, Bernoulli's theorem, Surface tension and its molecular interpretation.



<p><b>Basic Instrumental Skill- 1<sup>st</sup></b></p>	<p>Instruments accuracy, precision, sensitivity, resolution, range, least count of different instruments, Errors in measurements, Types of errors. Hand tools and their Uses: Identification, specifications, uses and maintenance of commonly used hand tools:  Tweezers Screwdriver (Combination Set), Pliers, Wire Cutters, Wire Strippers, Crimping Tools, Sockets &amp; Hex drivers, Clamps, Rotary Tools: Grinders, Portable Drill Machine, Small Hand Saws.  Different type of electrical cables and their Specifications. Types of wires &amp; cables, Standard wire gauge (SWG), Practice on different type of cable joint, Testing phase , neutral and Earth by tester and multi-meter and test lamp.  Introduction and explanation of electrical wiring systems, cleat wiring, capping &amp; Capping, house wiring, specification and types, rating &amp; material, Demonstration &amp; Practice on connecting common electrical accessories in circuits and testing them in series board., Testing &amp; replacement of different types of fuses, switches, plug, sockets. Identification of different wiring materials and their specification, Removing of insulation from assorted wires and cable, Making a switch board with electrical accessories, Making Extension board.</p>
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<p><b>List of Experiment (For B.Sc. 1<sup>st</sup> Sem)</b></p>	<ol style="list-style-type: none"> <li>1. To study the Motion of Spring and calculate (a) Spring constant, (b) <math>g</math> and (c) Modulus of rigidity.</li> <li>2. To determine the Moment of Inertia of a Flywheel.</li> <li>3. To determine <math>g</math> and velocity for a freely falling body using Digital Timing Technique.</li> <li>4. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).</li> <li>5. To determine the Young's Modulus of a Wire by Optical Lever Method.</li> <li>6. To determine the Young's Modulus by bending of beam.</li> <li>7. To determine the Modulus of Rigidity of a Wire by Maxwell's needle. To determine the elastic Constants of a wire by Searle's method.</li> <li>8. To determine the value of <math>g</math> using Bar Pendulum.</li> <li>9. To determine the value of <math>g</math> using Kater's Pendulum.</li> <li>10. To determine Surface Tension.</li> <li>11. To determine the modulus of rigidity by Barton's Apparatus (Horizontal and Vertical)</li> <li>12. To determine the elastic constants by Searle's method.</li> </ol>
<p><b>Electricity &amp; Magnetism</b></p>	<p style="text-align: center;"><b><u>B.Sc. 2<sup>nd</sup> Semester</u></b></p> <p>Coulomb law, Gauss' theory, its integral and differential forms, line integral of Electric field, Electric field and potential due to an arbitrary charge distribution. Electrostatic energy, energy stored in an Electric field. Electric field and potential due to long charged wire, Spherical shell, sphere, disc, dipole.</p> <p>Moments of charge distributions, Polar and non-polar molecule, polarization vector, electric displacement vector, three electric vectors, dielectric susceptibility and permittivity, polarizability, Clausius-Mossotti relation</p> <p>Magnetization, magnetic susceptibility, diamagnetic, paramagnetic and ferromagnetic substances, Hysteresis and B-H curve, Langevin's theories of Diamagnetism and paramagnetism, Weiss theory of ferromagnetism.</p> <p>Current density, Equation of Continuity, Ohm's law and electrical conductivity, Lorentz Drude theory, Wiedmann-Frenz law, Kirchhoff's Laws and their applications, Transient current, Growth and decay of D. C. in L - R and L - C circuits, charging and discharging of a capacitor through a Resistance.</p>

	<p>Lorentz force, Bio-Savert's law, Ampere's law, Application of Biot-Savert law, magnetic field due steady current in a long straight wire, Interaction between two wires, field due a Helmholtz coil, solenoid and current loop, magnetic vector potential, permeability, Energy stored in Magnetic field.</p> <p>Faraday's laws of induction, Lenz's law, Electromotive force, Measurement of magnetic field, Eddy current, Mutual inductance, Self-inductance. Impedance, admittance and reactance, R-C, R-L and L-C circuits with alternating e.m.f. source, series and parallel L-C-R circuits, resonance and sharpness, Quality factor, Power in A. C. circuits, Choke coil.</p>
<p><b>Basic Instrumental Skill-2<sup>nd</sup></b></p>	<p>Types of Batteries, Primary Cell, Secondary Cell, Wet charged, Dry-charged, Low maintenance, Construction of Battery, Case Cover plates, Separator, Cells, Electrolyte, Principles of Batteries, Lead Acid battery, Electrochemical reaction, Measure the voltages of the given cells/battery using analog/ digital multimeter, Charge and discharge the battery through load resistor, Maintain the secondary cells, Measure the specific gravity of the electrolyte using hydrometer. Testing Factor affecting charging, Cause of battery failure, diagnosis and testing, visual inspection, Heavy load test Professional, Test a battery and verify whether the battery is ready for use or needs recharging. Solders, flux and soldering technique. Different types of soldering guns related to Temperature and wattages, types of tips, Solder materials and their grading. Use of flux and other materials, Selection of soldering gun for specific requirement, Soldering and De-soldering stations and their specifications. Soldering/ De-soldering and Various Switches, Practice soldering on different electronic components, small transformer, Practice de-soldering.</p>
<p><b>List of Experiments (For B.Sc. 2<sup>nd</sup> Sem)</b></p>	<ol style="list-style-type: none"> <li>1. Frequency of A.C. Mains.</li> <li>2. Calibration of Voltmeter by potentiometer.</li> <li>3. Calibration of ammeter by potentiometer.</li> <li>4. Specific resistance determination.</li> <li>5. Conversion of a Galvanometer into a Voltmeter.</li> <li>6. Conversion of a Galvanometer into Ammeter.</li> <li>7. Variation of magnetic field along the axis of a current carrying circular coil.</li> <li>8. Comparison of capacities by Ballistic Galvanometer.</li> <li>9. Determination of Ballistic Constant.</li> <li>10. Electrochemical equivalent.</li> <li>11. De Sauty's bridge- C1/ C2</li> <li>12. R1/R2 by potentiometer.</li> <li>13. Study of R-C, L-C-R circuits.</li> <li>14. Determination of self inductance, mutual inductance.</li> <li>15. Magnetic field determination by search coil and ballistic galvanometer.</li> </ol>

**Minor  
Elective  
(Elementary  
Physics)**

Basic Idea of Physics and it's uses in daily life, Electric charge, Conductors, Insulators and Semiconductors, Coulomb's law, Quantization and conservation of charge, Basic Idea of electric field  
Resistance, Resistance in Series and Parallel, Direct and Alternating Current, Color codes for Resistors, Household Circuits, Wiring in Houses, Importance of fuse, Power and Power Losses, Unit of power loss, Heating effect of electric current, Uses of heating effect of current.  
Transformers, Types of transformers, Step up transformer, Step down transformer,  
Auto transformer, Central tap transformer, Wiring of transformer.  
Short and open circuits, Shorts in series circuit, shorts in parallel circuit, Open in series circuit, Open in parallel circuit, Duality in series and parallel circuits.  
Ammeters- Voltmeters and their uses, Measurements of thickness, Diameter and depth by Vernier- calipers Screw gauge and Spherometer, Multimeter and its uses, Dynamometer and Wattmeter, Block diagram of basic CRO, Construction of CRT, Electron gun, electrostatic focusing and acceleration.

<b>Thermodynamics &amp; Statistical Physics</b>	<p style="text-align: center;"><b><u>B.Sc. 3<sup>rd</sup> Semester</u></b></p> <p><b>Unit I:</b> Basic concepts and First law of thermodynamics  Thermodynamic Systems, Thermal equilibrium and Zeroth law of thermodynamics, Equation of state and First law of thermodynamics, Discussion of Heat and Work, Quasi-static Work; Reversible and Irreversible; Path Dependence; Heat Capacities Adiabatic Processes, Vander Wall equation, Distinction between Joule, Joule- Thompson and Adiabatic expansion of a gas.</p> <p><b>Unit II:</b> Second law of Thermodynamics and Entropy  Insufficiency of first law of thermodynamics, Condition of Reversibility, Carnot's Engine and Carnot's Cycle, Second law of thermodynamics, Carnot's Theorem, Thermodynamic scale of temperature and its identity to perfect gas, scale of temperature. Entropy, Mathematical formulation of Second law of thermodynamics,  Entropy of an ideal gas, T-S diagram and its applications, Evaluation of Entropy changes in simple cases, Third law of thermodynamics.</p> <p><b>Unit III:</b> Thermodynamic Relations Thermodynamic potentials, Maxwell's equation from thermodynamic potentials, Some useful manipulations with partial derivatives (cooling in adiabatic processes and Adiabatic stretching of a wire), The Clausius–Clapeyron's equations, Triple point, Applications of Maxwell's thermo</p> <p><b>Unit IV :</b>Transport of Heat and Kinetic theory of Gases  Black body radiation, Thermodynamics of radiations inside a hollow enclosure, Kirchoff's Laws, Derivation of Stefan Boltzmann Law, Wein's displacement law, Black body spectrum formulae early attempts, Raleigh Jean's Law, Quantum theory of Radiation, Planck's formula for black body spectrum, Wien's law, Radiation as a photon gas. Degree of Freedom Law of Equipartition of Energy, Distributive law of velocities, Most Probable speed, Average and root mean square velocities.</p> <p><b>Unit V:</b>Fundamentals of Statistical Mechanics: Probability and thermodynamic probability, postulates of statistical mechanics, macrostates and microstates,</p>
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<p><b>Lab Experiment List</b></p>	<p>equilibrium and fluctuation constraints, ensemble and average properties, phase space, <math>\Omega</math>-space and gamma space, division of phase space into cells, Micro canonical, canonical and grand canonical ensembles, Entropy and probability, interpretation of second law of thermodynamics, Boltzmann canonical distribution law. Classical and Quantum statistics, Comparison of three statistics.</p> <ol style="list-style-type: none"> <li>1. Thermal conductivity of a bad conductor by Lee's method.</li> <li>2. Mechanical equivalent of heat by Searle's method.</li> <li>3. Stefan's law</li> <li>4. Platinum resistance thermometer.</li> <li>5. Thermal conductivity of a good conductor by Searle's method.</li> <li>6. J by Callendar and Barnes method.</li> <li>7. Random throw- statistical method.</li> <li>8. Newton's law of cooling, sp. heat of Kerosene oil.</li> <li>9. Variation of thermos emf across two junctions of a thermocouple with temperature</li> <li>10. To show that deviation of probability of an event from theoretical values decreases with increase in the number of events (through coins and dices)</li> <li>11. To verify the laws of probability distribution and to verify laws of probability of throwing one coin, two coin and ten coins</li> <li>12. Study of statistical distribution from the given data and to find most probable value, average value and rms value</li> </ol>

<p><b>Basic Instrumentation Skills -III</b></p>	<p>Unit I Multimeter Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance. Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity.</p> <p>Unit II Digital Multimeter Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/frequency counter, time-base stability, accuracy and resolution.</p> <p>Unit III Electronic Voltmeter Principles of voltage measurement (block diagram only). Specifications of an electronic Voltmeter, AC millivoltmeter: Type of AC millivoltmeters, Block diagram ac milli-voltmeter, specifications and their significance.</p>
<p><b>Optics</b></p> <p><b>Lab Experiment List</b></p>	<p style="text-align: center;"><b><u>B.Sc. 4<sup>th</sup> Semester</u></b></p> <p>Unit I Geometrical Optics: Fermat's Principle: Principle of extremum path and its application to deduce laws of reflection and refraction, Gauss's general theory of image formation: Coaxial symmetrical system, Cardinal points of an optical system, general relationship, thick lens and lens combinations.</p> <p>Unit II Optical Instruments: Entrance and exit pupils, need for a multiple lens eyepiece, Ramsden's, Huygen's and Gaussian eyepieces, Astronomical refracting telescope, Spectrometer, Aberrations in images: Chromatic aberrations, achromatic combination of lenses in contact and separated lenses, Monochromatic aberrations and their reduction: aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives meniscus lens.</p> <p>Unit III Interference of Light: The principle of superposition, Two slit interference, coherence, Division of wave front and amplitude, Optical path retardations lateral shift of fringes, Fresnel biprism, Interference with multiple reflection, Thin films, Application for precision measurements, Haidinger fringes, Fringes of equal thickness and equal inclination.</p> <p>Unit IV Diffraction of Light: Fresnel Diffraction: Half-period zones, Zone plate, Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. Fraunhofer diffraction: Diffraction of a Single slit; Double Slit, Multiple slits and Diffraction grating.</p> <p>Unit V Polarization of Light: Transverse nature of light waves, Concept of Plane polarized light – production and analysis, Malus law, Brewster's law, Nicol prism, Circular and elliptical polarization, Double refraction.</p> <ol style="list-style-type: none"> <li>1. Nodal slide assembly, Location of cardinal points of lens system.</li> <li>2. Newton's formula.</li> <li>3. Dispersive power of prism.</li> <li>4. Resolving power of a telescope.</li> <li>5. To determine the Resolving Power of a Prism.</li> <li>6. To verify the Cauchy's dispersion formula.</li> <li>7. To find the thickness of the wire using optical bench.</li> <li>8. To determine the thickness of mica-sheet by using Biprism</li> <li>9. Newtons ring experiment</li> </ol>

<p><b>Basic Instrumentation Skills -IV</b></p>	<p>10. To determine specific rotation of cane sugar using polarimeter  11. Diffraction grating  12. Malus Law  13. Sextant</p> <p>Unit I Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only— no mathematical treatment), brief discussion on screen phosphor, visual persistence &amp; chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes.</p> <p>Digital storage Oscilloscope: Block diagram and principle of working.</p> <p>Unit II Signal and pulse Generators  Block diagram, explanation and specifications of low frequency signal generator and pulse generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.</p> <p>Unit III Impedance Bridges  Block diagram of bridge. Working principles of basic (balancing) RLC bridge, Specifications of RLC bridge, Block diagram and working principle as of a Q-meter, Digital LCR bridges.</p>
<p><b>Elementary Physics-II</b></p>	<p>Unit I Semiconductors- P- type, n-type, Semiconductor materials, pn diode, Depletion region, Working of pn diode, characteristics, Diode as a rectifier, Transistors PNP and NPN and their working.</p> <p>Unit II OPTICS- Mirrors and lenses, image formation, lens formula, Ramsden and Huygens eyepieces. 10</p> <p>Unit III Newton's first and Second Law, Concept of force and mass, Some particular forces, Newton's third law, Friction, Properties of friction.</p> <p>Unit IV Rectilinear motion, laws of motion, Work and energy, conservation of energy, law of gravitation and Kepler's law (not derivation).</p> <p>Unit V Thermodynamics systems, Thermal equilibrium, Zeroth law, work done, first law of thermodynamics, Internal energy, enthalpy.</p>
<p><b>Quantum Mechanics</b></p>	<p style="text-align: center;"><b><u>B.Sc. 3<sup>rd</sup> Year</u></b></p> <p>Understanding the origins of quantum theory- Blackbody radiation and early radiation laws, Planck's (revolutionary) idea (the quantum hypothesis &amp; birth of quantum mechanics), Photoelectric and Compton effects.</p> <p>Understanding the wave nature (and hence dual nature) of matter, De Broglie's idea of matter waves and their wavelength, Davisson-Germer Experiment, Wave-particle duality, The uncertainty principle (position-momentum and Energy-time), Interference experiments with particles.</p> <p>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.</p> <p>Learning to solve the Schrodinger's equation, Stationary states, Boundary conditions lead to quantization, Potential Step &amp; Barrier and transmission, Potential well (infinite and finite depths), The one dimensional harmonic oscillator in QM, Zero point energy.</p> <p>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</p>



	Frobenius's method, Emergence of the various quantum numbers (n, l and m).
<b>Modern Physics</b>	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.

	<p>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 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 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).</p> <p>Understanding radioactivity, Decay of nuclei, Radioactive decay law, Mean and half life, alpha, beta and gamma decays and their features, Pauli's neutrino prediction, Ideas of fission and fusion of nuclei, Mass deficit and energy generation, Controlled nuclear fission and the nuclear reactor, Energy production in stars, Particle detectors.</p>
<b>Basic Electronics</b>	<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 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>
<b>Practical (B.Sc. 3<sup>rd</sup> Year)</b>	<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.**

PSO1: 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.

PSO2: 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).

PSO3: 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.

PSO4: 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.

PSO5: To get an exposure to research and research methodology during the dissertation work (theoretical and/or experimental) to be performed during the last semester.

PSO6: 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)).

PSO7: 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>Classical Mechanics</b>	Understanding the various alternative formulations of Classical Mechanics (e.g. Newtonian, Action Principle(s), Lagrangian and Hamiltonian formulations). Realizing the need (Advantages/Disadvantages) of the various formulations and the unified appearance of the various conservation laws. Paving the way for transition towards Quantum Mechanics (as well as proper understanding/formulation of Statistical Mechanics) via the appropriate formulation of Classical Mechanics. Applying the ideas to problem solving- Rigid body dynamics, Small Oscillations etc.
<b>Mathematical Physics</b>	Acquiring the mathematical tools needed during Physics study at the M.Sc. level (and elsewhere also). Realizing the “unreasonable effectiveness” of Mathematics in the Physical Sciences (in general). Working with mathematical rigor (at the Physicists level of rigor) and developing the ability/habit of tackling complex problems. Applying the tools acquired here to the other courses (e.g. CM, ED, QM, SM etc.)
<b>Astrophysics</b>	Gain a basic understanding of applying Physics at the grandest scales i.e. in Astrophysics/Cosmology.

	<p>Understanding observational methods/tools and related theoretical concepts to infer properties of bodies/system located far away in the Universe.</p> <p>Understanding stellar processes and features (Energy generation, Magnitudes, H-R diagram, Evolution, Brightness, Luminosity, Spectra etc.)</p> <p>A mathematical understanding of the processes occurring within a star in the form of some fundamental physics equations (Mass distribution, Hydrostatic Equilibrium, State equations, R-V theorem etc.)</p>
<b>Electrodynamics</b>	<p>Realizing the unification of Electricity and Magnetism as a single physical concept- Electromagnetism (or Electrodynamics) and that Maxwell's equations express this fact.</p> <p>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.</p> <p>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>
<b>Practical</b>	<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. LCR, UJT, Transistors, Diodes, DIAC, TRIAC, FET, Amplifiers, Oscillators etc.). The student should use and develop "hand-skills", observation-skills, mathematical tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.</p>
<b>Atomic Molecular Physics &amp;</b>	<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>
<b>Solid State Physics</b>	<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</p>

	<p>of phonons and phonon gas etc.)  Understanding the thermal properties of solids on the basis of the phonon picture.</p>
<b>Statistical Mechanics</b>	<p>Understanding the (average) microscopic description vs. the macroscopic description (as done in Thermodynamics) for a system with large no. of degrees of freedom.  Understanding (and calculating within the framework) the various statistical ensembles and the corresponding (thermodynamic) formulations.  Application of the statistical ideas to derive/understand the behavior of gases (ideal as well as real).  Understanding the basics of Quantum SM (FD &amp; BE stat) and some simple applications.  Understanding blackbody radiation as a gas of photons (i.e statistical treatment- BE statistics).</p>
<b>Quantum Mechanics</b>	<p>Understanding that our world is inherently quantum and so the proper framework to understand it is Quantum Mechanics.  “Establishing”/Understanding the basic framework of QM (Schrodinger’s equation, wavefunction and probabilistic interpretation, uncertainty relations etc.).  Learning to solve the Schrodinger’s (time-independent) equation (various one and three dimensional problems).  Understanding the various formulations of QM and their equivalence- Schrodinger, Heisenberg (Matrix) and Dirac formulations.  Understanding symmetry in QM- Space and Time translation symmetries as well as Rotational symmetry (Angular momentum, Spin, Addition etc.)  Understanding the various approximation methods to solve the Schrodinger’s equation (Perturbation, Variational method, WKB approximation) and application to different (stationary) state problems.  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>
<b>Practical</b>	<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. Multivibrators, Interferometers, 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>
<b>Advanced Quantum Mechanics</b>	<p>Understanding, applying and formulating QM at an even deeper level than done earlier (in the QM Course).  Applying quantum ideas to understand the scattering of particles. Employing various (approximate) methods- Partial Wave Analysis and the Born approximation.  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)</p>

	<p>quantum mechanics. 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>
<b>Nuclear Physics</b>	<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.</p> <p>Understanding radioactive decay and its various feature.</p> <p>Understanding nuclear reactions by applying (mainly) quantum ideas to them.</p>
<b>Particle Physics</b>	<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).</p> <p>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>
<b>Electronics- A</b>	<p>Acquire a basic understanding of electronic principles (analog and digital).</p> <p>Understanding of various oscillator circuits (including multivibrators).</p> <p>Understanding of logic gates (basic, universal and combinational) and the various technologies (RTL, TTL, CMOS, 7400 family etc.) used to implement them.</p> <p>Ability to “construct”, simplify and implement various logic functions/circuits (Adder/Sub tractors, Comparators, MUX and dMUX, Coders, Encoders, Decoders).</p> <p>Understanding memory elements (Flipflops- RS, JK, D, Master-Slave, Clocked vs. Unclocked etc.; Registers and Counters) as Sequential circuits.</p> <p>Understanding the various “memory devices” and IC-technologies.</p>
<b>Practical</b>	<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 (mainly Electronics e.g. IC-study (555, 723), Logic circuits (basic- AND/OR/NOT/NAND/XOR etc. to advanced- Adders/MUX/dMUX etc. and memory elements- RS, JK etc.), Microprocessor, SCR, DIAC, TRIAC, GM-counter etc.). The student should use and develop “hand-skills”, observation-skills, mathematical</p>

	tools (analytical, numerical, graphical etc.) to gradually connect theory with experiments.
<b>Computational Physics</b>	<p>Acquiring the basic ability to solve physical problems (i.e. equations-algebraic, differential, matrix etc.) using numerical techniques.</p> <p>Learning the techniques/methods of numerical analysis (Interpolation methods, Differential equation solving, Matrix inversion, Integration, Roots of equations etc.)</p> <p>Learning computer programming (FORTRAN) and implementing numerical recipes/algorithms on the computer (usually using iterative methods) to solve problems (including physical problems- Kepler's problem).</p>
<b>Environmental Physics</b>	<p>Learning to understand over surroundings (atmosphere, radiation and environment in general) using the principles of physics.</p> <p>Understanding the atmosphere (its structure, thermodynamics, transport phenomenon, hydrostatic equilibrium, and green house effect).</p> <p>Understanding solar radiation receive on earth (Radiation laws, Matter-Light Interaction, Scattering, Ozone depletion etc.).</p> <p>Understanding water and air pollution (Fluid dynamics, Diffusion, Noise Pollution etc.).</p> <p>Understanding the world energy needs and ways to generate energy for our use (Renewable vs. Non-renewable, Environmental changes and climate due to anthropogenic activities).</p>
<b>Laser &amp; Fiber Optics</b>	<p>Understanding the basic principles of a Laser (semi classical/quantum theory of radiation, Einstein's coefficients, Pumping, Population Inversion, Coherence- spatial and temporal).</p> <p>Knowledge of the various kind of lasers (3 and 4 level systems, He-Ne, Argon, Gas, Solid-state, Semiconductor, Ruby, Nd-YAG etc.) and their features.</p> <p>Getting a basic idea of non-linear optics (harmonic generations, phase matching, self-focusing etc.).</p> <p>Understanding use(s) of laser as an investigating tool (to investigate material properties)- Laser spectroscopy.</p>
<b>Electronics- B (Elective)</b>	<p>Understanding the basic electronic involved in communication electronics.</p> <p>Understanding modulation and demodulation (AM, FM, SSB, Phase- Various circuits to generate and detect).</p> <p>Understanding radio communication (ground and sky propagations, role of ionosphere, Appleton-Hartley theory, Radar and its workings).</p> <p>Understanding Transmission Line (basically EM Waves in conductors).</p> <p>Developing ability to solve related problems (Line parameters, TL-equations, Impedances, SWR, Reflection coefficient etc.).</p> <p>Understanding the various kind of antenna to broadcast and receive radio signals.</p>
<b>Practical/ Dissertation/ Project</b>	<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>

