

Course Outcomes
for
4 Year Undergraduate Programme (Bachelor)
with Multiple Exit Options

Under NCCF

DEPARTMENT OF BENGALI

1stYear

Semester-I

Major-I

History of Bengali Literature (Ancient and Medieval period)

(Credit: 6)

This course introduces to the students about the premodern Bengali literature and society. It helps students to understand the background of the development of Bengali language through general introduction of Charyapada and Srikrishnakirtan. This paper will also help students to interpret ancient texts which has rooted religious adherence. Students will know the socio-cultural and historical identity of the Middle Ages through literary sources.

4 Year Undergraduate Programme (Bachelor) With Multiple Exit

Options in Bengali

1stYear

Semester-I

Minor-I

History of Bengali Literature (Ancient and Medieval period)

(Credit: 6)

This course attempts to provide the students in-depth knowledge about the premodern Bengali literature and society. It helps students to understand the background of the development of Bengali language through general introduction of Charyapada and Srikrishnakirtan. This will help students to understand the socio-cultural and historical identity of the Middle Ages through literary sources. This is a foundational course of Bengali literature.

Semester-I

MDC-I

(Bengali Literature and Literary Comparison)

(Credit: 3)

In this course, students will get a basic knowledge about the periodization of Bengali literature. In this addition to this, students can learn literary comparison by covering some selected texts of Bankimchandra Chattopadhyay and Rabindranath Tagore. It encourages students to develop their interest in literary translation and comparative analysis of literature.

This paper will also help students to understand the theological tradition of Bengali poetry through ‘VaishnavaPadavali’

Semester-I
SEC-I

(Bengali Writting, Proof Reading and Publication)

(Credit: 3)

This Skill Enhancement Course has been designed to develop the writing skills of the students and prepare them for both professional and academic writing along with enhancing their critical thinking about literature. The second part of the course shall be to teach students fundamentals of Proof reading and basic editing of books.

Semester-I
AEC-I

(Applied education of Bengali language)

(Credit: 4)

The major objective of the paper is to enhance the communication skills which should be integral to personal, social and professional interaction. Besides, it will help the students to write idiomatic Bengali by practicing of grammar and to realize the eternal melody of literature.

1stYear

Semester-II
Major-2

(History of Bengali Literature (Modern Era)

(Credit: 6)

This course attempts to provide the students in-depth knowledge about the modern Bengali literature and society. This course provides a fundamental understanding of the shifting sociocultural scenario of colonial Bengal at the wake of modernism which continues to independence and the development of post-independence contemporary Bengali literature. Students will get to know the sociocultural and political identity of the modern Bengal through literary sources.

1stYear

Semester-II
Minor-2

(History of Bengali Literature (Modern Era)

(Credit: 6)

This course introduces to the students about the premodern Bengali literature and society. This will help students to understand the socio-cultural and political identity of the Modern Ages of Bengal through literary sources. This is a foundational course of modern Bengali literature.

**Semester-II
SEC-2**

(Bengali Writting, Proof Reading and Publication)

(Credit: 3)

In the second part of this course students learn the basic of proof reading. They learn how to follow grammar rules and spelling norms (we follow the spelling norms prescribed by Pashchimbanga Bangla Academy). Then they learn the traditional method of correcting proofs with various signs and marks. They are also taught how to use those symbols in Microsoft Word or similar digital writing platforms.

DEPARTMENT: ENGLISH

NEW SYLLABUS UNDER NEP (UG ENGLISH) FOUR YEARS

FIRST SEMESTER: MAJOR I: HISTORY OF ENGLISH LITERATURE

Course Level Learning Outcomes:

1. Students will be aware of the characteristics of the various ages of English Literature.
2. Students will know the different factors responsible for the literary developments that have taken place over the centuries in English Literature.

Course Content:

Unit I: Old & Middle English Literature

- Anglo- Saxon Heroic, Christian and Elegiac Poetry, Anglo Saxon Prose
- Morality & Miracle Plays, Chaucer, Langland
- Metrical Romances

Unit 2: Renaissance Literature

- Renaissance Background
- University Wits
- Elizabethan Poetry (Special focus on Sidney, Spenser and Shakespeare)
- Elizabethan Drama
- Elizabethan Prose

Unit 3: 17th and 18th Century Literature

- Metaphysical Poetry
- Jacobean Drama
- Milton
- Age of Restoration
- Comedy of Manners & Heroic Tragedy
- Neo-Classicism
- Augustan Verse Satire
- Periodical Essays
- Precursors of Novel (Swift & Defoe)

- Rise of the Novel (Fielding, Richardson)
- Precursors of Romantic Poetry

Unit 4: 19th Century Literature Romanticism

- Major Romantic Poets (Wordsworth, Coleridge, Shelley and Keats)
- 19th Century Essayists (Lamb, Hazlitt, Carlyle, Arnold)
- 19th Century Women Novelists (Jane Austen, Bronte Sisters, George Eliot)
- Victorian Novelists (Dickens, Thackeray, Hardy)
- Victorian Poets (Tennyson, Browning, Arnold, Pre-Raphaelites)

Unit 5: 20th Century Literature

- Modernism
- War Poetry
- Modern Poetry (Yeats, T.S. Eliot, Dylan Thomas)
- Psychological Novel
- Irish Literary Movement
- Absurd Drama

MINOR 1: INTRODUCTION TO ENGLISH LITERATURE

Course Level Learning Outcomes:

1. Students will be aware of the characteristics of the various ages of English Literature.
2. Students will know the different features of the works of some of the major writers of English Literature.

Course Content:

Unit 1: Chaucer and his contributions

Unit 2: Renaissance, University Wits, Shakespeare

Unit 3: Metaphysical Poets, Restoration Comedy of Manners, Rise of the novel (Richardson & Fielding)

Unit 4: Romanticism, Keats, Shelley, Wordsworth, Coleridge, Tennyson, Browning

Unit 5: Modernism, War Poetry, T.S. Eliot, Yeats

MULTIDISCIPLINARY COURSE 1

TITLE: INDIAN CULTURAL TEXTS

Course Level Learning Outcomes:

1. Students will appreciate the rich cultural heritage of India.
2. Students will understand the Indian Ecology through various Indian cultural texts.

Course Content:

Unit 1: Regional versions of Mahabharata (Eastern India)

Unit 2: Environment and Brihadaranayaka Upanishad

Unit 3: Concepts of *Itihaas* (Grand narratives of history) and *Mithas* (Muthos / Myth)

Unit 4: The Concept of Bharatvarsha as a Rajchakravarti-Kshetra (Text: Bani Basu's *Maitreya Jataka*- Publisher: Ananda Publishers, 2014 (Bengali), *The Birth of the Maitreya*, Stree Publishers, 2004 (English translation)]

ABILITY ENHANCEMENT COURSE (ALTERNATIVE ENGLISH) 1

Course Level Learning Outcomes:

1. Students can communicate easily in English in their future workplaces.

Syllabus:

Unit 1: Precis Writing

Unit 2: Application Writing (JOB/Bank Loan/ FIR)

Unit 3: Report Writing

Unit 4: Comprehension from a given prose passage

SEC -1 in Spoken English

Course Level Learning Outcomes:

Students will enhance communicative skills as well as skills in presentation and survey activities in academic and professional fields.

Course Content:

Unit 1 . The sounds of English. Pronunciation of Words and Everyday phrases. Preliminary level phonetics.

Unit 2. Spoken Skills: Greetings, Introducing oneself, Everyday phrases and responses. Asking questions, Giving answers.

Unit 3. Vocabulary and Word Recognition. Basic ideas about parts of speech; number, gender in nouns and pronouns. Oral Expression of the Language: Brief Story-telling, Narrating a local event, Interviews.

SEC 1 : Proofreading in English

Course Level Learning Outcomes:

Students will learn to become successful proofreader in publishing houses, either substantive or freelancing. It will equip the students with the good habit of turning rough copy into powerful, flawless and effective writing.

Course Content:

Unit 1:

The basics of Proofreading.

- Capitalization ● Apostrophes ● Hyphens ● Commas and Semicolons ● Quotation Marks

Unit 2:

Looking at Grammar when proofreading.

- Subject/Verb Agreement ● Noun/Pronoun Agreement

Unit 3 :

- Commonly Misused Words. Correcting Malapropism, wrongly put Homophones and other common mistakes in the proof.

NEW SYLLABUS UNDER NEP (UG ENGLISH) FOUR YEARS

SECOND SEMESTER:

MAJOR II: RHETORIC PROSODY & LITERARY TYPES

Course Level Learning Outcomes

Objectives:

1. To make the students familiar with the Figures of Speech and metrical patterns used in English poetry.
2. To make the students aware of the various genres of English literature.

Outcome:

1. Students will be able to critically appreciate English poetry.
2. Students will have a thorough understanding of the various genres of English literature.

Course Content:

Unit 1: • Rhetoric: Figures of Speech (To identify, define and explain from given passages)

Unit 2: • Prosody: Scansion, Identification of predominant meters, Variation of a given text

Unit 3: • Epic: Classical Epic, Mock-heroic Epic, Epic-Novel) • Lyric (Ode, Ballad, Sonnet, Elegy)

Unit 4: • Tragedy: Aristotelean Concept of Tragedy, Greek and Shakespearean Tragedy • Comedy: Greek Comedy, Shakespearean Comedy, Comedy of Manners, Comedy of Humours

Unit 5: • Novel: Autobiographical Novel, Bildungsroman, Künstlerroman, Epistolary Novel, Picaresque Novel, Stream of Consciousness Novel

MINOR 2: INTRODUCTION TO LITERARY TYPES**Objectives:**

1. To make the students aware of the various genres of English literature.
2. To make the students acquainted with the various literary terms.

Outcome:

1. Students will have a thorough understanding of the various genres of English literature.
2. Students will gain knowledge of the various literary terms which will help them appreciate English Literature in general.

Syllabus:

Unit 1: Different Forms of Lyric (Ode, Sonnet, Elegy)

Unit 2: Aristotelean Concept of Tragedy, Greek Tragedy versus Shakespearean Tragedy

Unit 3: Comedy (Comedy of Manners, Comedy of Humours, Romantic Comedy)

Unit 4: Historical Novel, Autobiographical Novel

Unit 5: Short Notes: Allegory, Symbolism, Imagism, Metaphor, Simile, Ballad, Dramatic Monologue, Soliloquy, Epilogue, Prologue.

SEC -1 in Spoken English**Course Level Learning Outcomes:**

Students will enhance communicative skills as well as skills in presentation and survey activities in academic and professional fields.

Course Content:

Unit 1. Condensation of sentences - one word substitutions for larger phrases. Tense of verbs, change of tense.

Unit 2. Mock Interview, Mock sales persuasion of products.

Unit 3. Reading News Headlines. News Reading.

SEC 1 : Proofreading in English

Course Level Learning Outcomes:

Students will enhance proofreading skills into editing skills.

Course Content:

Unit 1. Basics of editing: checking structural mismatch such as in tense, number, gender etc.

Unit 2. American and British Spelling Variations

Unit 3: Advanced preparedness for working as Proofreader.

- Making Online Profiles for the profession of proofreading
- Writing a proposal for proofreading to publishing houses or blogs.

Department of Sanskrit

Major – 1

General Sanskrit Grammar & Fable Literature

The course is designed to achieve a range of objectives, including the knowledge of general Sanskrit Grammar, fostering literary appreciation, enhancing language proficiency, instilling moral values, and fostering cultural understanding. Through the study of grammar principles and the analysis of artistry, moral teachings, and historical context, students can greatly improve their linguistic abilities and critical thinking skills.

Minor – 1

History of Sanskrit Literature & Nītiśataka

The course aims to provide a comprehensive understanding of cultural, religious, and philosophical dimensions of ancient Indian civilization. Through the study of Vedic, Itihāsa&Purāṇa literature, and Nītiśataka of Bhartṛhari, students gain insights into literary techniques, moral values, societal norms, and the pursuit of virtue, enhancing their understanding of human behaviour and social conduct.

MDC – 1

Foundational Literature of Indian Civilization

The course offers a holistic exploration of the foundational texts and disciplines of Indian civilization, delving into culture, society, knowledge systems, and scientific contributions. By studying the Vedas, Itihāsa and Purāṇa literature, and Sanskrit scientific and technical literature, students develop a profound understanding of literary techniques while gaining valuable insights into India's rich heritage. This comprehensive approach fosters a deep appreciation of Indian Knowledge System (IKS).

AEC – 1

Communicative Sanskrit

The course focuses on developing students' communicative Sanskrit proficiency, fostering comprehension and usage of words in diverse contexts. Students learn to apply Sanskrit vocabulary in daily life, encompassing areas such as education, anatomy, occupations, nature, and numbers. By the end of the course, students possess effective communication skills, practical application of Sanskrit, and proficiency in numbers and time calculation.

Major – 2

Classical Sanskrit Literature & Metre

The course includes the selected texts from Classical Sanskrit Literature & Metre to make students aware about the treasure of ancient classical Sanskrit literature. It also strengthens the knowledge of Sanskrit metre used in classical Sanskrit texts. The course design emphasizes understanding Kālidāsa's Raghuvamśa and Bhāsa's Svapnavāsavadatta, exploring content, themes, and characters. Students gain proficiency in Chandomañjarī of Gaṅgādāsa, analyzing metrical patterns. Through these texts, students enhance knowledge of classical Sanskrit literature and Sanskrit metres, fostering critical engagement, understanding of intricacies, and appreciation for Sanskrit poetry.

Minor –2

Basic Sanskrit Grammar & Poetry

The course focuses on enhancing proficiency in word forms, verb forms, Sandhi rules, affixes, particles, and translation skills. Students engage in the study of the fourteenth canto of Kālidāsa's Raghuvamśa, developing a deep understanding of its content, themes, and literary techniques. The course provides a strong foundation in Sanskrit grammar, proficiency in poetry, and the ability to accurately translate, facilitating effective engagement with Sanskrit texts and the expression of ideas.

DEPARTMENT: History

(With effect from 2023-2024 to Onwards)

1st Semester

Major course

History of India

(Pre-History to 650 A.D.)

Course outcome:

Studying 1st semester Major course of Indian history from the Pre-Historic age to 650 A.D. provides learners with a deep understanding of the following course outcomes:

- 1. Understanding Cultural Evolution:** Students comprehend the cultural evolution of the Indian subcontinent from the earliest settlements to the emergence of complex societies.
- 2. Knowledge of Ancient Civilizations:** Gain insights into the Indus Valley Civilization, its urban planning, trade networks, and decline.
- 3. Appreciation of Vedic Period:** Understand the significance of the Vedic period, including the composition of the Rigveda, socio-political organization, and religious beliefs.
- 4. Insight into Early Empires:** Explore the rise and fall of early empires such as the Maurya and Gupta empires, understanding their political structures, administrative systems, and contributions to art, science, and literature.
- 5. Understanding Religious and Philosophical Developments:** Examine the emergence and evolution of major religions and philosophies such as Hinduism, Buddhism, and Jainism, and their impact on society and culture.
- 6. Comprehension of Trade and Cultural Exchange:** Analyze the patterns of trade and cultural exchange with other regions, including Central Asia, Southeast Asia, and the Mediterranean.
- 7. Awareness of Historical Methodologies:** Develop critical thinking skills by evaluating various historical sources, including archaeological findings, inscriptions, and literary texts.
- 8. Recognition of Socio-economic Structures:** Understand the socio-economic structures of ancient Indian society, including the caste system, agrarian economy, and urbanization processes.
- 9. Understanding Political Dynamics:** Examine the political dynamics, conflicts, and alliances among different kingdoms and empires during this period.
- 10. Appreciation of Art and Architecture:** Appreciate the art and architectural achievements of ancient India, including cave temples, stupas, sculptures, and paintings.

These outcomes collectively provide students with a comprehensive understanding of the rich and diverse history of ancient India and its significance in shaping the cultural, social, and political landscape of the subcontinent.

1st Semester
Minor Course
History of Ancient India
(Indus Valley Civilization to 1206 A. D.)

Course outcomes :

The Course Outcomes for Minor Course on History of Ancient India (Indus Valley Civilization to 1206 A.D are as follows -

1. Understand the geographical, social, and economic features of the Indus Valley Civilization and its significance in the development of ancient Indian society.
2. Analyze the political organization, religious beliefs, and cultural achievements of ancient India, including the Vedic period, Mauryan Empire, and Gupta Empire.
3. Evaluate the impact of external influences such as the Achaemenid Empire, Alexander the Great's invasion, and the Kushan Empire on ancient Indian society and culture.
4. Examine the evolution of Hinduism, Buddhism, and Jainism, and their roles in shaping religious practices, social structures, and philosophical thought in ancient India.
5. Explore the development of trade routes, urban centers, and technological advancements in ancient India, including the significance of the Silk Road and maritime trade networks.
6. Assess the contributions of ancient Indian scholars in the fields of mathematics, science, literature, and art, such as Aryabhata, Chanakya, Kalidasa, and the Ajanta Caves.
7. Discuss the socio-economic conditions of different social groups in ancient India, including the varna (caste) system, gender roles, and the status of women.
8. Critically analyze the reasons for the decline of ancient Indian empires and the subsequent invasions and migrations leading up to the establishment of the Delhi Sultanate in 1206 A.D.
9. Explore the sources of ancient Indian history, including archaeological findings, inscriptions, religious texts, and accounts of foreign travelers, and evaluate their reliability and biases.
10. Develop critical thinking, research, and analytical skills through the study of primary and secondary sources, debates, and discussions on key historical events and developments in ancient India.

2nd Semester
Major course (History of India)
(650 A.D to 1526 A.D)

Course outcome :

Studying 2nd Semester Major course Indian history from 650 A.D. to 1526 A.D. encompasses several key course outcomes, including:

1. Understanding the socio-political developments: Students should grasp the evolution of Indian society and politics during this period, including the rise and fall of various kingdoms and empires such as the Rashtrakutas, Cholas, Delhi Sultanate, and Vijayanagara Empire.

2. Exploring cultural and religious transformations: Learners should analyze the impact of religious movements like Buddhism, Jainism, Hinduism, and Islam on Indian society, as well as the flourishing of art, architecture, literature, and philosophy.

3. Examining economic changes: The course should cover the growth of trade, urbanization, agricultural advancements, and the establishment of trade networks within and beyond India, including the Indian Ocean trade routes.

4. Assessing foreign invasions and interactions: Students should understand the impact of foreign invasions, including those by the Arabs, Turks, and Mongols, and how these interactions influenced Indian society, culture, and politics.

5. Analyzing technological and scientific advancements: The course should explore innovations in fields such as mathematics, astronomy, medicine, and metallurgy, including contributions from scholars like Aryabhata, Bhaskara, and Al-Biruni.

6. Evaluating the emergence of the Delhi Sultanate and the Mughal Empire: Learners should comprehend the establishment, expansion, and decline of these significant Islamic dynasties in the Indian subcontinent, including their administrative systems, architectural achievements, and cultural legacies.

7. Understanding social structures and dynamics: Students should examine caste systems, gender roles, class distinctions, and religious practices prevalent during this period, as well as the interplay between various social groups.

8. Reflecting on historiographical debates: The course should encourage critical thinking by exploring differing historical interpretations and debates surrounding key events, figures, and processes in Indian history from 650 A.D. to 1526 A.D.

By achieving these outcomes, students gain a comprehensive understanding of the complexities and dynamics of Indian history during this pivotal era.

2nd Semester

Minor course

History of Medieval India

(1206 A. D. to 1757 A.D.)

Course outcomes :

Studying 2nd Semester Minor Course History of Medieval India from 1206 to 1757 provides insights into various aspects of Indian society, culture, politics, and economy during this period. Some of the course outcomes typically include:

1. Understanding the political dynamics: Students should be able to analyse the rise and fall of various dynasties such as the Delhi Sultanate, Mughal Empire, and regional kingdoms, and understand the factors contributing to their political stability or instability.

2. Socio-cultural changes: Exploring the impact of medieval Indian history on society, including the development of languages, literature, art, architecture, and religious practices, and how these changed over time due to interactions between different cultures and communities.

3. Economic structures: Understanding the agrarian economy, trade networks, and urbanization during this period, including the role of merchants, artisans, and guilds, and how economic factors influenced political developments.

4. Religious dynamics: Examining the coexistence and conflicts between different religious communities such as Hinduism, Islam, Buddhism, and Sikhism, and understanding the ways in which religion intersected with politics and society.

5. Administrative systems: Analyzing the administrative structures and policies of various rulers, including revenue collection, justice administration, and the role of bureaucracy, and evaluating their effectiveness and impact on governance.

6. Military strategies and conflicts: Studying the military technologies, tactics, and campaigns of medieval Indian rulers, including invasions, conquests, and resistance movements, and their significance in shaping regional and imperial politics.

7. Interactions with the outside world: Exploring the trade relations, cultural exchanges, and diplomatic engagements between medieval India and other regions such as Central Asia, the Middle East, Southeast Asia, and Europe, and understanding the impact of these interactions on Indian society and culture.

Overall, the study of medieval Indian history provides a comprehensive understanding of the complexities and continuities in Indian civilization during this transformative period.

MDC

History of India

In this course, MDC, students from other disciplines can acquire some knowledge of History of India from ancient to modern period.

The brief overview of course outcomes for Indian history from ancient to modern periods:

1. Ancient Period:

- Understanding the Indus Valley Civilization and its socio-economic structure.
- Exploring the Vedic Age and the emergence of Hinduism.
- Analyzing the Mauryan and Gupta Empires and their contributions to Indian society and culture.
- Studying the development of Buddhism and Jainism and their impact on Indian society.
- Investigating trade and cultural exchanges with other civilizations, such as the Greeks and Romans.

2. Medieval Period:

- Examining the rise and expansion of Islam in India and the establishment of Muslim rule.
- Understanding the Delhi Sultanate and the Mughal Empire and their administrative, architectural, and cultural achievements.
- Analyzing the Bhakti and Sufi movements and their role in religious syncretism.

- Studying the impact of European arrival and the beginning of colonialism with the establishment of Portuguese, Dutch, French, and British trading posts.

3. Modern Period:

- Exploring the British East India Company's rule and the subsequent British colonial administration.
- Investigating the socio-economic changes brought about by British rule, including land revenue systems and industrialization.
- Understanding the Indian freedom struggle, including key figures, movements, and events such as the Indian National Congress, Quit India Movement, and Partition.
- Analyzing the post-independence period, including nation-building, economic development, and challenges such as regionalism, communalism, and caste-based politics.

These outcomes provide students with a comprehensive understanding of the major historical developments in India from ancient times to the modern era.

DEPARTMENT OF GEOGRAPHY

1st Year

Semester-I

Paper: 1A (Theory)

Major-I (Physical Geography)

(Credit: 4)

Learning Outcomes

- This course helps to nurture the basic concepts of Physical Geography, Geomorphology and Climatology.
- This module also helps to build a strong foundation especially about the Origin of Continents and Ocean Basins along with the theories of Plate Tectonic, Conventional Current Theory Isostasy and Sea Floor Spreading.
- The students develop an understanding about the Geological Time Scale and Evolution of Landforms and Lives in different Geological Periods.
- This paper also gives ideas about the Fundamental Concepts in Geomorphology along with the Development of Drainage and evolution of Landforms on various underlying structure.
- In this paper students develop understanding of Insolation along with horizontal and vertical distribution of Temperature and Pressure on the surface of the earth.
- Students will also understand different forms of Precipitation along with mechanism of Precipitation in different regions of the earth surface.

Broad Content

- Basic Concepts of Physical Geography
- Basic ideas of Geomorphology
- Basic Concepts of Climatology

1st Year

Semester-

Paper 1B (Practical)

Major-I

(Basic Cartographic Techniques and Map Readings)

(Credit: 2)

Learning Outcomes

- The topic 'Scale' helps the students to learn about the different types of scales and the ability to develop the skill of finer measurement. This also enables them to read maps.

- Students develop the skill of analysis and interpretation of SOI Topographical Maps which help them to identify various physical and cultural features and to explore the relationship between them

Broad Content

- Scales
- Analysis and interpretation of S.O.I. Maps of Plateau area

1st Year

Semester-I

MDC-I

Paper: 1A

(Fundamentals of Physical Geography)

(Credit: 3)

Learning Outcomes

- Students will learn about the fundamental concept of Geomorphology and the evolution of landforms.
- Students will know the concept of hydrology and hydrological cycle and ground water dynamics.
- Students will learn and gain knowledge about Biogeography and Ecosystems.
- Students will be able to identify and gain knowledge about Local Landforms through Field Visit and Project Work.

Broad Content

- Geomorphology
- Hydrology
- Biogeography
- Project

1st Year

Semester-I

SEC-I: Tourism

(Introduction to Tourism and Basic Skills)

(Credit: 3)

Learning Outcomes

- Students will understand and be able to differentiate between various types of tourism and their associated terminologies.
- Gain practical exposure to local tourist destinations, enabling them to analyze tourist flows and

infrastructure.

- Develop effective communication and hospitality skills pertinent to the tourism industry.
- Identify potential local tourist attractions and devise strategies to promote them.
- Demonstrate basic operational skills in a travel agency or hotel setting through roleplaying exercises.

Broad Content

- Tourism Basics and Terminology
- Field Visit to Local Tourist Destinations
- Practical Hospitality Skills
- Assignment on Local Tourism Potential
- Role Play

1st Year

Semester-I

SEC-I: Basic GIS Mapping with QGIS

(Credit: 3)

Learning Outcomes

- To learn how to navigate the QGIS interface, load various types of geospatial data, and create basic maps and visualizations.
- To conduct essential spatial analysis tasks such as buffering, overlaying, querying, and geo-processing using QGIS tools and plugins.
- To learn how to build and manage geospatial databases, import/export data, and utilize QGIS as a powerful tool for data management and spatial data integration.

Broad Content

- Introduction to GIS and QGIS
- Basic Operations of QGIS
- Application of GIS
- Project Work

1st Year

Semester-II

Paper: 2A (Theory)

Major II: Fundamentals of Human Geography

(Credit: 4)

Learning Outcomes

- Students will learn Meaning, Concept, Nature, Scope and development of Human Geography.

- Students will understand Cultural Changes in and around the world.
- Students will learn about the different races, religions, tribes, their culture and cultural development.

Broad Content

- Introduction to Human Geography
- Social Geography
- Cultural Geography

1st Year

Semester-II

Paper: 2B (Practical)

Major II: Elementary Instrumental Observation and Map Reading

(Credit: 2)

Learning Outcomes

- Students will learn about function and use of meteorological instruments
- Students will learn about function and use of Geomorphological instruments
- Students will learn to represent climatic data

Broad Content

- Meteorological Instruments
- Geomorphological Instruments
- Representation of Climatic Data

1st Year

Semester-I

SEC-II: Tourism

(Advanced Tourism Practices and Digital Skills)

(Credit: 3)

Learning Outcomes

- Students will acquire knowledge about travel agency operations, including planning itineraries, ticketing, and reservations.
- Students will be able to understand the significance of digital marketing in tourism and be familiar with SEO, SEM, SMM, and various online platforms.
- Students will be able to design a promotional campaign for a tourism destination using digital tools.
- Students will be able to recognize the importance of ecotourism and sustainable practices and propose strategies for their implementation.

- Students will develop photography skills, focusing on capturing tourist attractions and experiences.
- Students will gain proficiency in managing and responding to feedback, emphasizing online reputation management.

Broad Content

- Travel Agency Operations
- Digital Marketing in Tourism
- Ecotourism and Sustainable Tourism
- Travel Photography Workshop
- Feedback and Review Management

Semester-II

SEC-II: GIS Mapping with QGIS

(Credit: 3)

Learning Outcomes

- Students will learn about the concept and principals of Remote Sensing along with basic concept of Visual, Thermal, Infrared and Microwave Remote Sensing.
- Students will learn to classify images along with class editing and change detection study.
- Students will be able to georeferenced satellite image, prepare LULC maps along with preparation of different Indices Map such as NDVI, NDBI, NDWI, MNDWI, EVI.

Broad Content

- Basic concept of Remote Sensing
- GIS Models and Map Layout
- Image Classification

Project

Link for the Syllabus of Geography in the CBPBU website:

https://cbpbu.ac.in/ugsyllabus_nep.php

DEPARTMENT OF POLITICAL SCIENCE

COURSE OUTCOME OF UNDER GRADUATE COURSE UNDER NCCF (2023-24)

SEMESTER-I

MAJOR- ONE

PAPER- BASIC CONCEPTS AND THEORIES OF POLITICAL SCIENCE

COURSE OUTCOME: The outcome of this paper is to build a strong understanding about the development of Political Science as an academic discipline. This paper is designed to learn about the different approaches, theories, concept and ideologies of Political Science which is very much relevant to the present day. Furthermore, it will be helpful for the students for any in-depth study and research in future in the field of Political Science.

MDC-1

PAPER- INDIAN CONSTITUTION AND DEMOCRATIC AWARENESS

COURSE OUTCOME: The main outcome of this paper is to study the students about the history of Constituent Assembly, the basic features of our Constitution, the Preamble and the different issues described in the Constitution like importance of Fundamental Rights and Duties of Citizen, the most relevant issues like the judicial system of our country and different laws relating to the burning problems of our society and also to aware the students about the rights and status of Human, Women and Child and their protection under the different commission in India. This interesting academic paper no doubt will help the students not only further study but also provide a self confidence about the Constitution in their professional or everyday life.

SEMESTER-II

MAJOR- TWO

PAPER: INDIAN CONSTITUTION AND GOVERNMENT

COURSE OUTCOME: The outcome of this paper is to make aware the students about the history of Constituent Assembly, the basic features of our Constitution, the Preamble and the different issues described in the Constitution like importance of Fundamental Rights and Duties of Citizen, the nature of our Federation which are the basic concept of our Constitution. This paper will help the students to understand the functioning of Union, State and Local Governments in Indian federal system and also special issues like composition and activities of the Election Commission and amendment procedure of the Constitution of India. No doubt, Indian Constitution is an area of special attraction of the research scholars nationally and internationally. The present course will grow the interest of the students in the area of Indian Government and Politics.

Link: https://www.cbpbu.ac.in/userfiles/file/2023/Syllabus_NEP2023/Political%20Science.pdf

DEPARTMENT OF PHILOSOPHY
PAPER WISE COURSE OUTCOMES
NCCF SYSTEM

SEMESTER-I

Course: Major 1

Paper Title: ETHICS

The NCCF Philosophy syllabus for the first semester provides one Major Paper (Paper Code: PHI-MAJ1) under the title Ethics. This paper is grouped into two broad parts having two units in each group. The first unit of Group A deals with Indian Ethics where some basic ethical concepts like Satya, Ahimsa, Maitri, Karma, Purusarthas are included along with the Ethical background and principles of the three Indian Heterodox systems, namely, Carvaka, Jaina and Buddha. On the other hand, the second unit of Group A is focused on the Mimamsa and the Yoga ethics from the Orthodox schools of traditional Indian Philosophy. It, further, includes the Ethics of the Gita as well as Gandhian Ethics of Sarvodaya, End and Means.

On the other hand, the third unit of Group B is dealing with Definition, Nature and Scope of Western Ethics, Statement of Facts and Statement of Values, concepts of Moral and Non-moral actions, of Voluntary and Non-voluntary actions, Postulates of Morality, nature and object of Moral Judgment etc. The fourth or the last unit of this paper is structured into the study of Utilitarianism and the arguments for and against it. It also includes the course of Kantian ethical understanding of Categorical Imperative, Duty for duty's sake, and Good Will. This paper also incorporates the study of Virtue Ethics of Plato and Aristotle and further offers a deal of the issue of Punishment.

Outcome:

When Philosophy is said to lay the foundation of society, the above course under the title Ethics is significant to induce the relevance of Values and Ethics in Human life in the budding generation so that as beginners of learning Philosophy the students would be aware of not only the traditional values of their country, India, but also would equip with the Western concepts of Morality in such a way that may grow in them the sense of duty, responsibility, good will, virtue, non-violence, friendliness, utilitarian concepts, freedom of will, punishment and the like. The inclusion of Ethics as a Major paper 1 is, thus, designed to meet the present day moral crisis in the society with an introductory note to this generation of learners where they may well connect the significance of the virtues and values of society both from the Eastern and the Western perspectives that will reflect the basic need of such values and virtues which are the fulcrum of the society in general and the individual in particular. Hence, the study of Ethics as a Major 1 paper in an initial Semester would provide the foundation to the development of a society where the individuals would be well aware of the necessary codes of conduct to the prosperity of the nation as well as that of themselves as individual citizens.

Course: Minor 1

Paper Title: ETHICS AND RELIGION

The Minor 1 course is titled as "Ethics and Religion". It is, therefore, classed into two groups where Group A under two units offers Ethics of which Unit I starts with the deal of definition, nature and scope of Ethics. It, further, deals with concepts of Moral and Non-moral actions, Voluntary and Non-voluntary actions, Postulates of morality, nature and object of Moral Judgment, problem of Freedom of will. In Unit II covers basic concept of Deontological and Consequential Ethics, Theories of Punishment, Ethics of the Gita, concept of Niskama and Sakama Karma, of Sthitapragna, Loksamgraha, and Gandhian Ethics of Satya, Ahimsa and Sarvodaya.

Group B is focused on the Religion part and is divided into another two units. In Unit III an outline of origin and nature of Religion is planned with inclusion of the notions of God as Personalistic, Impersonalistic, and Naturalistic along with the estimate of Proofs for the existence of God. Unit IV offers an understanding of Religious Consciousness, Religious Knowledge, Reason, revelation and Mysticism. It also includes essence of Major Religions like Hinduism, Buddhism, Islam, Christianity and their comparative study.

Outcome:

The Minor 1 syllabus is designed for those students who have not chosen Philosophy as their Major subject. However, a study of the contents of Ethics and that of Religion seems primary to the concern of all as humans and specially to meet the usual curiosity about the world around the young minds and to help them in decision making or in choosing their acts of life. That is why issues of Ethics and Religion are included as crucial areas of study even for those who choose Philosophy as their Minor subject. Thus, the knowledge of the study of Ethics in Western context like Deontology and Consequentialism, and in Indian contexts like ethics of the Gita and Gandhian ethical notions, as prescribed in the syllabus, aims at helping the young learners about the estimation of good and bad acts and in determining as well as performing right conduct in place of wrong ones; while the study of Religious Consciousness and of Knowledge including the concept and arguments in favour of the existence of God along with a comparative understanding of the Major Religions of the world seems to develop a sense of infinite attitude, of bliss, of tolerance, of sympathy, of surrender and sacrifice, of salvation and the like among this generation of students which may, in turn, meet their curiosities about life and world and may build their rational faith in the uniformity of nature, their positive confidence not only in career building but also in their character building as well as in ascertaining their goals of life in a broad sense. This will definitely bring moral and spiritual development of each individual and consequently, to the society at large.

Course: SEC 1

Paper Title: PROFESSIONAL ETHICS

SEC is a course regarding the enhancement of skills of students. Therefore, it is wholly a practical oriented paper. In Philosophy, SEC 1 paper offers a course on Professional Ethics. It is distributed into four Units of which the first Unit deals with the basic concept of Professional Ethics which includes a study of Governing Ethics as well as an outline of Personal and Professional Ethics. Unit II prescribes the study of understanding the nature and dimensions of Ethics along with the understanding of Postulates of Ethics and an understanding of Practicing Moral and Non-Moral actions, and the Conditions of Moral Judgment. The third Unit includes understanding of the Norms of Professional Conduct versus Profession where the concepts of Responsibility, Obligations, and Moral Values as well as Professional Codes of Ethics are offered. In the last and the fourth Unit we find the concepts of Moral Value and Responsibility, Moral and Non-moral Senses of "Good", Morality and cultivation of traits, Morality of Traits versus Morality of Principles, Dispositions to be cultivated, Moral Responsibility, Freewill and Responsibility.

Outcome:

The SEC 1 Course is planned in such a way to give an ethical foundation to the students that at the end of the course they would be clear about their role and responsibility towards their respective Professions along with proper use of their Freewill they may become eligible to match the various moral codes of life with the codes of their professions. In fact, by an understanding of the concepts and issues related to professional ethics they will infuse in them all the relevant moral codes of their professions and would justify their service to the nation in general and to the world at large.

Course: MDC 1

Paper Title: PRACTICAL APPLICATION OF PHILOSOPHY

MDC or Multidisciplinary Course in Philosophy is offered to those students who have Philosophy neither as Major nor as Minor, nor as a subject in their Higher Secondary course. Hence, it gives a space of understanding the Practical Application Philosophy to the students for whom this seems to be an absolutely new subject. The MDC in Philosophy

is designed under four Units. Unit I straightway deals with the meaning of Philosophy and its application in Practical Life, and the nature of Ethics and its application in practical life along with some current moral issues and solution. Unit II prescribes a study of Religious Conflicts, its effects and solution, Religious Plurality and Religious Pluralism. The third Unit concentrates on the issue of Political Conflicts, its origin and solution. It, further, includes a study of the issue of Family conflict, role, attitude and behaviour of members. And, the last Unit of MDC 1 prescribes the understanding of the Ethics of national reconstruction, the context of Cardinal virtues and its application in practical life.

Outcome:

The outcome of MDC 1 seems very extensive in the sense that it not only introduces the new learners of the subject an understanding of the rational aspect of man and also teaches them how this rational aspect cause their meaningful human existence and their corresponding role to nature, to the society, to the world. In other words, by learning the meaning and significance of Philosophy and Ethics and by understanding the practical aspect of these areas of study the Non-Philosophy students would be able to connect the relevance of Philosophy in their life in general and in context of framing their world views individually. This course gives a scope of discussion of various concepts like Religious conflicts and Religious Pluralism, Political conflicts and corresponding solutions, Family conflicts and roles of the members in a family which enables a student of 1st semester to learn to reflect on these issues and in preparing for his future role in these regards. Furthermore, by learning the ethics that guides in national reconstruction this paper provides its learner a scope of building a fresh stand of his own in matters of Religion, Society, Family and the Nation which, in turn, supports the reconstruction of the Nation with genuine and fruitful perceptions. In this regard, the knowledge of the deal of Cardinal Virtues further adds the possible direction to this great goal of nation building.

SEMESTER-II

Course: Major 2

Paper Title: INDIAN PHILOSOPHY

This paper fully concentrates on the basic outlines of Indian Philosophy including the issues of Epistemology and Metaphysics in all the nine systems of ancient Indian Philosophy. Here, this paper is divided into two broad groups of which Group A deals with the issues of Epistemology and Metaphysics in all the three heterodox schools, namely, Carvaka, Jaina, Buddha under Unit I and under Unit II it covers the orthodox ideas of Nyaya and Vaisesika schools, their Pluralism and Atomism and etc.; while Group B prescribes the issues of Epistemology and Metaphysics in the rest of the orthodox schools of traditional India known as Samkhya, Yoga, Mimamsa and Vedanta under Unit III and IV respectively. Hence, the Metaphysical and Epistemological ideas and issues in all the nine systems are offered in a particular order. To speak elaborately, this paper, thus, provides scope for the study of Carvaka Materialism as well as Jaina view of Manysidedness of Reality, of Buddha view of Impermanence or Momentariness, concepts like Nirvana and the means to its achievement, of Nyaya Pluralism, Vaisesika Atomism, Samkhya Dualism, Yoga Psychology, Mimamsa system of Actions and Vedanta view of Reality; on the other there is the possible framework of studying the factors in knowledge like the sources, kinds and conditions of knowledge, i.e., Perception, Inference, Testimony, Direct and Indirect mediums in knowledge, ordinary and extraordinary, illusory or real forms of Knowledge and the like. In short, the major issues of all the nine systems of Indian Philosophy are prescribed in the broad headings of Epistemology and Metaphysics.

Outcome:

The plan of offering a systematic outline of Indian Philosophy to the second semester students of Major in Philosophy with the introduction of various issues of Philosophy like knowledge, its sources, kinds and conditions along with the interpretation of life, world, soul and God or even reality and reaching the reality and etc., is to bring a systematic orientation to the young learners of Philosophy of their tradition which is multidimensional. Starting from Carvaka Materialism to Vedanta Spiritualism the diverse philosophical ideas as rooted in Indian Philosophy of our tradition are the keys to the door towards self development and self fulfillment in which the practical life remains glorified and never ignored. For, the origin of Indian Philosophy is due to some necessity of our practical life. Hence, this course in Major 2 aims at showing that despite the differences in attitudes the different schools of Indian Philosophy offer us an

outlook towards our practical issues and thereby give us a rich tradition with variety of philosophical ideas which in turn will help our future generation to reflect on these various issues under different attitudes and views that may cause not only richer philosophical developments but also will give rise to personality development in the young students with appropriate vision towards life.

Course: Minor 2

Paper Title: INDIAN PHILOSOPHY: AN OVERVIEW

The Minor 2 course in Philosophy includes a brief study of the nine systems of Indian Philosophy. The title of it, thus, seems relevant here which reads Indian Philosophy: an overview. This paper also has group wise distribution of concepts in all the various schools of traditional Indian Philosophy. Group A, thus, includes in its Unit I the Epistemology and Metaphysics of the Carvaka, Jaina concept of Anekantavada, Syadvada and Saptabhanginaya, while the Four Noble Truths of Buddhism along with their interpretation of Pratityasamutpada, Ksanabhangavada, Nairatmavada completes the study of this unit. On the other hand, Unit II includes the Nyaya concept of Prama and Pramanas and Vaisesika concept of Padarthas. Group B has two more units of which the Unit III covers a study of the concept of Causality, Prakrti, Evolution of Prakrti and Purusa along with the understanding of the Yoga concept of Citta, Cittavrtti, Cittabhumi, Astanga Yoga and God. The Unit IV or the last unit of this Group B section deals with Purvamimamsa concept of Sruti and its importance, Arthapatti, and Anupalabdhi as Pramanas, while it prescribes, further, the study of the Vedanta (Advaita and Visistadvaita) like the concepts of Brahman, Adhyasa, Vivartavada, Maya, Jiva, Jivanmukti in Advaita and that of Saguna Brahman, Refutation of Maya, Parinamavada, Jiva, Rejection of Jivanmukti in Visistadvaita.

Outcome:

This paper for the second Semester Minor students seems to offer an overview of some basic issues and concepts of Epistemology and Metaphysics in traditional Indian Philosophy. The designing of this course, thus, offers a combined study of the primary concepts of Epistemology and Metaphysics in different systems of India so that the students may learn the original trends in the domain of their own ancestral Philosophy and accordingly can act and reflect on the issues of life and the world around. By this is meant that they can regulate their life in such a direction that usually gives such visions of reality and its realization that are conducive to our practical needs, physical or mental or even sometimes spiritual. However, from a general standpoint, though the paths of reaching the Real seems divergent in the different positions of the nine schools of traditional India, yet they all suggest the ways of realizing a state of peace, of happiness, of freedom, which form the basic needs of any or every mankind. So, by understanding Carvaka Materialism or Jaina Anekantavada and Syadvada or Pratityasamutpada and Khanabhangavada of Buddhism along with a study of the major knowing sources in Nyaya or Mimamsa, discovering Padarthas of Vaisesikas, or conceiving the Prakrti Parinamavada in Samkhya as well as the Cittavrttis or Cittabhumis and the Astanga Yoga in Yoga Darsana and the monistic ideas of the Upanisads as reflected in Advaita and Visistadvaita Vedanta the students can accommodate their positions in life, can choose their options from among the various schools here towards reaching the goal or destiny of life and can also bring further advancements in the sphere of knowledge and reality by either reflecting on or practicing these ideas of Indian tradition.

Course: SEC

Paper Title: PROFESSIONAL ETHICS

The SEC 2 paper for the students of the second Semester is an extension of concepts in understanding the field of Professional Ethics as initially offered in 1st Semester SEC syllabus. Its structure as a Paper II course in SEC, thus, is formed of concepts of Ethics and the implication of these concepts in various Professions, as relevant. In this regard, this course is classed under four units. The first unit deals with Moral issues and Moral Dilemmas in addition to which concepts like Moral Autonomy, Religion and Ethics, Types of Enquiry, Use of Ethical Theories are there. Unit II

reflects the concepts of Rights and Responsibilities of Professionals, of citizens and the like; while Unit III gives light on the Ethics to principles and practice where concepts like Duty, Utility, Virtue, Care, The Ethics of Uncertainty and a new Ethics for Policing gets focus. The fourth Unit concerns with the issues of Professional Ethics and Human Rights along with a glimpse of the International standard in policy making.

Outcome:

The progression in the SEC Paper II of Professional Ethics here in the second Semester depicts that the students would acquire the understanding of various moral issues and corresponding dilemmas to these issues and can make themselves prepared for experiencing such dilemmas in their professional spheres and can be ready to cope up with these situations in appropriate ways as far as practicable. This paper also teaches them the significance of moral autonomy, the role, responsibility as well as the rights of each professional as professionals and also as citizens. The third unit provides scope for actualizing the principles of Duty, Care, Virtue and the like in our real life situation. Here, a significant area of Police professionals got a reference such that it would help the students to understand and practice all the possible moral codes and conducts in context of a particular profession, say, Policing. Like many other professions this profession of Policing is an instance of performance of various codes of conduct as relevant to professional as well as to the civil life. Further, a study of the contexts of Professional Ethics and Human Rights seems to be a need of the hour. For, while dealing with Professional Ethics the reference to the issues of Human Rights seems vital in the sense that without such reference no conducts in ethics can accurately be called professional or human at all. Last but not the least, this paper would prepare the students in understanding the International standards in policy making and thereby can motivate them in performing with required eligibility and morality in their chosen filed of actions, i.e., their Professions.

DEPARTMENT: EDUCATION

COURSE OUTCOME FOR MAJOR I EDUCATION

under NCCF

SEMESTER-1

MAJOR-I

COURSE TITLE: FOUNDATIONS OF EDUCATION-I

COURSE OUTCOMES:

- State and develop an understanding of the basic concept (meaning, nature and scope) of Educational Philosophy.
- Will be able to explain through examples how philosophy and education as disciplines influences each other.
- Explain the main philosophical ideas of Indian and Western Schools of Philosophy with reference three domains of philosophical inquiry- metaphysics, epistemology and axiology.
- Establish a concept of Educational Psychology.
- Understand and apply the knowledge of psychology in education.
- Analyze growth and development and its differences.
- Explain the various characteristics of different stages of development and developmental characteristics – physical, social, emotional and cognitive.

COURSE OUTCOME FOR MAJOR I EDUCATION UNDER NCCF

SEMESTER-1

MDC-I

COURSE TITLE: HUMAN GROWTH AND DEVELOPMENT

COURSE OUTCOMES:

- Understand the concept of growth and development.
- Compare the concepts of growth and development.
- Comprehend the principles of development.
- Explain the characteristics of stages of human development.
- Analyze stages and application of Piaget's cognitive development.

- Understand and explain stages and characteristics of Kohlberg's moral development

COURSE OUTCOME FOR MAJOR II EDUCATION UNDER NCCF SEMESTER-1I

COURSE TITLE: FOUNDATIONS OF EDUCATION-II

COURSE OUTCOMES:

- Develop comprehensive and interdisciplinary understanding about the basic concept, nature and scope of educational sociology.
- Formulate an inspiring vision on various social groups and their functions, nature of Social stratification and social mobility.
- Increase analytic thought about Culture and its components and determinants.
- Identify the educational aspirations of our country including the various constitutional provisions for the development of education.
- Adopt innovative and lateral thinking and interpersonal skills to generate solutions about the contemporary issues in education.
- Demonstrate the ability to work effectively and respectfully with diverse teams through participating seminar, field activity or community engagement.

DEPARTMENT OF ECONOMICS

Course Outcome of Major-I: Introductory Microeconomics

Unit-I: This unit would impart knowledge among the students to determine the factors that affect supply and demand, and show how changes in the market's supply and demand curves affect the equilibrium price and output.

Unit-II:

1) This part of the unit on Utility analysis would give students insight into market demand, and would provide them the opportunity to further explore the nuances of consumer behaviour. Also, it would make students aware that the Market purchases are based on the satisfaction of wants and requirements created by the consumption of an item.

2) Through this part of the unit, students would be able to recognise and explain economic theories and concepts linked to consumer behaviour.

Unit –III: It would help the students to comprehend how a producer makes decisions about what to produce and how much to produce and how to optimise his profit.

Unit – IV: This unit would enable students to learn about cost and revenue functions and their different shapes.

Course Outcome of Major-II: Introductory Macroeconomics

Unit I: Completion of this unit would help students to interpret various measures of National income accounting and also acquaint them to determine the income flow in various economic sectors to recognize the significance of national income as an indicator of the well-being of an economy.

Unit II: This unit would help students to assess the impact of price on goods and services in economics. The unit also offers to gain insights about various forms of inflation, deflation, and the trade-off between inflation and unemployment.

Unit III: From this unit students would learn to explain various principles and theories of employment.

Unit IV: This unit would appraise students about fundamentals of money supply, the functions of the commercial and central banks of India, and their approaches to credit management.

Course Outcome of MDC-I: BANKING AND FINANCIAL MARKETS OF INDIA

Unit I: Through this unit, students would learn the concepts and differences between banks and non-bank financial institutions and the services provided by these institutions. This would help them understand the structure of Indian banking system.

Unit II: This unit would impart knowledge regarding the functions, role, and performances of commercial banks in creation of credit.

Unit III: This unit would describe the role, functions, and credit control mechanisms of the Indian Central Bank to the students. This would also pinpoint the factors that influence the availability of money supply and monetary policy reforms of RBI, that are intended to help the Indian economy.

Unit IV: This unit would explain the novel ideas of establishment of development banks, their purposes, and how they contribute to India's overall economic growth.

Unit V: This unit would provide a comprehensive view of the current banking system's structure. It would help students comprehend the tools of contemporary banking systems and the distinct features of debit and credit cards.

Unit VI: This unit would define the role and functions of financial markets, as well as their structure, reforms, and goals for financial inclusion in India.

Course Outcome of Skill Enhancement Course (SEC): GST – Filing

Keeping in mind the NEP 2020, the university has recommended various skill enhancement courses to impart soft skills among the students to make them well trained and job ready for the modern era of Market Economy. One such course offered by the Department of Economics for the students of Acharya Brojendra Nath Seal College is GST – Filing. The course outcome of this Skill Enhancement Course is as follows –

1. **Computerised Accounting & Banking Operations:** It is to impart knowledge of computerised accounting system, with a hands-on training on a computerised accounting software, 'Tally'. This would help students develop accounting skills. This part of the course would also enhance the knowledge of fundamentals of banking operations.
2. **E-Filing of IT Returns:** This part of the course would make the students Financially literate and make them aware of the applications of different banking schemes. It would also impart introductory knowledge of Income Tax and would provide a hands-on training on E-Filing of Income Tax Returns.
3. **GST Filing:** This part of the course would make students aware of the current GST Laws prevailing in India. And, it would provide a hands-on training on the GST Registration process, along with the filling and maintenance of GST Returns.

Course outcome for NCCF under NEP
Department of Physics

Semester-1

Major-1: Mechanics and General Properties of Matter

After going through the course, the student should be able to:

Revise the knowledge of calculus, vectors, vector calculus. These basic mathematical structures are essential in solving problems in various branches of Physics as well as in engineering.

· Learn the curvilinear coordinates which have applications in problems with spherical and cylindrical symmetries.

· Understand laws of motion and their application to various dynamical situations, notion of inertial frames and concept of Galilean invariance. He / she will learn the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.

· Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.

· Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.

· Understand the phenomena of collisions and idea about centre of mass and laboratory frames and their correlation.

· Understand the principles of elasticity through the study of Young Modulus and modulus of rigidity.

· Understand simple principles of fluid flow and the equations governing fluid dynamics.

· Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation.

· Explain the phenomena of simple harmonic motion and the properties of systems executing such motions.

· Describe how fictitious forces arise in a non-inertial frame, e.g., why a person sitting in a merry-go-round experiences an outward pull.

· Describe special relativistic effects and their effects on the mass and energy of a moving object.

· Appreciate the nuances of Special Theory of Relativity (STR).

· In the laboratory course, the student shall perform experiments related to mechanics (compound pendulum), rotational dynamics (Flywheel), elastic properties (Young Modulus and Modulus of Rigidity) and fluid dynamics (verification of Stokes law, Searle method) etc.

Minor-1: Mechanics and General Properties of Matter

After going through the course, the student should be able to:

Revise the knowledge of calculus, vectors, vector calculus. These basic mathematical structures are essential in solving problems in various branches of Physics as well as in engineering.

· Learn the curvilinear coordinates which have applications in problems with spherical and cylindrical symmetries.

· Understand laws of motion and their application to various dynamical situations, notion of inertial frames and concept of Galilean invariance. He / she will learn the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.

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· Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.

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· Understand simple principles of fluid flow and the equations governing fluid dynamics.

· Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation.

· Explain the phenomena of simple harmonic motion and the properties of systems executing such motions.

· Describe how fictitious forces arise in a non-inertial frame, e.g., why a person sitting in a merry-go-round experiences an outward pull.

· In the laboratory course, the student shall perform experiments related to mechanics (compound pendulum), rotational dynamics (Flywheel), elastic properties (Young Modulus and Modulus of Rigidity) and fluid dynamics (verification of Stokes law, Searle method) etc.

SEC-1: Computational Physics - 1

After going through the course, the student should be able to:

Understand fundamental Python syntax and apply Python program for mathematical computations such as arithmetic operations, algebraic manipulations, and numerical methods.

Implementing physics related algorithms and simulations using Python libraries like NumPy and SciPy.

Solving mathematical and physics problems programmatically.

Acquire skills in data visualization for representing mathematical and physical concepts graphically and interpret and present simulation results effectively, using libraries like Matplotlib and Plotly.

Integrating Python with mathematical and physics concepts to create practical applications or simulations.

Explore techniques for optimizing computational code to improve performance and efficiency, ensuring faster execution and scalability.

Proficiency in working with arrays and matrices using Python libraries like NumPy, including operations such as indexing, slicing, and element-wise operations.

Utilizing arrays effectively to store and manipulate data in Python programs, especially for numerical computations and data processing tasks.

Ability to apply curve fitting techniques such as linear regression, polynomial regression, and non-linear curve fitting using Python libraries like NumPy, SciPy, and Matplotlib.

Implementing algorithms to find roots of equations accurately and efficiently for mathematical and scientific computations. Understanding and implementing numerical methods for finding roots of equations such as Newton-Raphson method, bisection method, and secant method in Python.

MDC : Physics

Module 1: Physical World and Measurement

1. Understand the nature of physical laws and the necessity of measurement in physics.
2. Identify different units of measurement and systems of units, including fundamental and derived units.
3. Perform dimensional analysis and understand the order of magnitudes of physical quantities.
4. Describe the structure of both macroscopic and microscopic worlds.

Module 2: Scalars and Vectors

1. Differentiate between scalar and vector quantities and demonstrate proficiency in general vector notation.
2. Calculate position and displacement vectors and perform vector addition and subtraction.
3. Utilize unit vectors and rectangular components in vector calculations.
4. Apply scalar and vector products and understand their significance in physics.

Module 3: Kinematics

1. Define frame of reference and distinguish between rest and motion.
2. Calculate distance, displacement, average speed, instantaneous speed, average velocity, and instantaneous velocity.

3. Analyse motion in straight lines, projectile motion, and uniform circular motion.

Module 4: Laws of Motion

1. Explain intuitive concepts of force and Newton's laws of motion.
2. Discuss inertia and identify fundamental forces.
3. Analyse pseudo forces and qualitative aspects of friction.

Module 5: Work, Energy and Power

1. Calculate kinetic energy, work done, and understand the work-energy theorem.
2. Determine potential energy and its variations including gravitational and elastic potential energy.
3. Apply the principle of conservation of mechanical energy.

Module 6: Gravitation

1. Describe Kepler's laws of planetary motion and the universal law of gravitation.
2. Calculate acceleration due to gravity and understand its variation with altitude, depth, and Earth's rotation.
3. Discuss escape velocity, orbital velocity of satellites, and their qualitative aspects.

Module 7: Properties of Bulk Matter

1. Analyze elastic behavior and stress-strain relationships.
2. Calculate various properties such as Young's modulus and bulk modulus.
3. Understand pressure due to fluid column, Pascal's law, viscosity, and surface tension.

Module 8: Current Electricity

1. Explain electric current, drift velocity, Ohm's law, and electrical resistance.
2. Analyse series and parallel combinations of resistances and temperature dependence of resistance.
3. Understand V-I characteristics, electrical energy, power, resistivity, and conductivity.

Module 9: Semiconductor

1. Describe energy bands in conductors, semiconductors, and insulators.
2. Analyse types of semiconductors and the I-V characteristics of p-n junction diodes.

These course outcomes provide a comprehensive overview of the knowledge and skills students are expected to gain from each module of the physics syllabus.

Semester-2

Major-2: Electricity and Magnetism

After going through the course, the student should be able to

- Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.
- Apply Gauss's law of electrostatics to solve a variety of problems.
- Articulate knowledge of electric current, resistance and capacitance in terms of electric field and electric potential.
- Demonstrate a working understanding of capacitors.
- Describe the magnetic field produced by magnetic dipoles and electric currents.
- Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.
- Understand the dielectric properties, magnetic properties of materials and the phenomena of electromagnetic induction.
- Describe how magnetism is produced and list examples where its effects are observed.
- Apply Kirchhoff's rules to analyse AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.
- Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,

Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

In the laboratory course the student will get an opportunity to verify various laws in electricity and magnetism such as Lenz's law, Faraday's law and learn about the construction, working of various measuring instruments.

· Should be able to verify of various circuit laws, network theorems elaborated above, using simple electric circuits.

Minor-2: Electricity and Magnetism

After going through the course, the student should be able to

- Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.
- Apply Gauss's law of electrostatics to solve a variety of problems.
- Articulate knowledge of electric current, resistance and capacitance in terms of electric field and electric potential.
- Demonstrate a working understanding of capacitors.
- Describe the magnetic field produced by magnetic dipoles and electric currents.
- Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.
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- Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity, Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

In the laboratory course the student will get an opportunity to verify various laws in electricity and magnetism such as Lenz's law, Faraday's law and learn about the construction, working of various measuring instruments.

· Should be able to verify of various circuit laws, network theorems elaborated above, using simple electric circuits.

SEC-2: Computational Physics – 2

After going through the course, the student should be able to:

Understanding the principles of linear algebra and its applications in computational physics.

Implementing and applying iteration methods such as Jacobi and Gauss-Seidel methods for solving systems of linear equations in Python.

Ability to apply Gauss-Seidel method for solving linear systems iteratively with Python, including convergence analysis and error estimation.

Proficiency in LU decomposition technique for solving linear systems efficiently and accurately in Python.

Applying Monte Carlo simulation methods to solve complex physics problems, including statistical mechanics, quantum mechanics, and particle physics, using Python.

Implementing Monte Carlo simulations for numerical integration, solving differential equations, and generating random samples in Python.

Implementing various differentiation methods such as forward difference, backward difference, and central difference.

Calculating derivatives of functions using symbolic differentiation libraries like SymPy.

Applying numerical integration techniques like the trapezoidal rule, Simpson's rule, and Monte Carlo integration.

Utilizing symbolic integration libraries like SymPy to compute indefinite and definite integrals symbolically.

Solving ordinary differential equations (ODEs) using numerical methods such as Euler's method, Runge-Kutta methods (RK Method), and finite difference methods..

Utilizing symbolic computation libraries like SymPy to solve differential equations symbolically when possible.

Applying calculus concepts to real-world problems in physics, engineering, economics, and other fields. Simulating and modeling dynamic systems using differential equations and calculus-based techniques.

Course Outcomes

DEPARTMENT OF CHEMISTRY

Semester-I

Paper: MAJOR-1-Fundamentals of Chemistry -I

Inorganic Chemistry

Module 1: Periodic Table and Periodic Properties

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

1. Periodic table and arrangement of different elements.
2. Basic and fundamental periodic parameter and their changes along the periods and groups.

Module 2: Acids and Bases

On completion of this module, the students will gain comprehensive knowledge about different theories of acids and bases.

Organic Chemistry

Module 1: Basics of Organic Chemistry

After studying basic of Organic Chemistry, student will be able to understand and learn about:

- Hybridization, bonding, classification, nomenclature and physical properties of organic compounds.
- Various electronic effects like polarization, inductive effect, resonance (resonance energy) and also learn about the acid-base nature of various organic compounds.
- Reaction thermodynamics: enthalpy, free energy, and energy profile diagram for exothermic and endothermic reaction.
- The different types of bond cleavage and subsequent stability of the generated intermediates like carbocations, carbanions and radicals and also learn the detail concept on tautomerism.
 - Different types of organic reaction mechanism (elementary idea).
- The aromatic, nonaromatic, antiaromatic and homoaromatic compounds after adopting the concept of aromaticity.

Module II: Stereochemistry-I

After studying basic stereochemistry, students will be able to understand and learn

- The of 3D structure of molecule; the way of representation by knowing the different projection formulae, isomerism (enantiomerism and diastereomerism) and nomenclature of stereoisomers.
 - The concept of chirality, optical activity, specific rotation of organic compounds,

Module 2: Stereochemistry-I

After studying basic stereochemistry, students will be able to understand and learn

- The of 3D structure of molecule; the way of representation by knowing the different projection formulae, isomerism (enantiomerism and diastereomerism) and nomenclature of stereoisomers.
- The concept of chirality, optical activity, specific rotation of organic compounds,
- Relative and absolute configuration: D/L and R/S designations.

Practical:

After studying this course students will be able to

- Detect special elements (N, S, Cl, Br, I) present in organic compounds
- Determine melting point of the given compounds

Physical Chemistry Module1:Gaseous state

They will learn about a general idea about the gaseous state. Students can learn that why there required various corrected form of equation of state *viz.* van der Waals equation, virial equation, etc. They will get introduce with the concept of critical points and compressibility factor.

Module 2: Ionic Equilibria

Students get introduce with Ostwald dilution law for weak electrolyte. They can get a detail idea about pH scale and can learn how to calculate pH for both weak and strong acid/ base, and also for various salt hydrolysis. They will learn the importance and mechanistic action of buffer solution and a detailed theory how to prepare a buffer of given any pH. Student will acquire knowledge on the theory of titration especially acid-base titration, and will surely learn how the choice of indicator play a key role during the titration.

Module 3: *Experimental*

Students will be expert for preparing any standard solution of given strength (both primary and secondary). They can perform the conventional acid-base titrimetric procedure and can find the strength of any unknown secondary solution by applying this method. They can confidently prepare a buffer solution (*viz.* acetic acid buffer) of any given pH. Moreover, they will be self-sufficient to set the pH-meter for checking the experimental pH of the prepared solution.

Semester-II

Paper: MAJOR-2-Fundamentals of Chemistry -2

Inorganic Chemistry Module 1: Atomic Structure

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

1. Atomic theory and its evolution.
2. Quantum theory of atoms, concept of wave function.
3. Quantum numbers and their significance.
4. Shape of different orbitals.
5. Electronic configuration and their related rules.

Module 2: Bonding

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

1. Bonding between atoms and molecules; ionic bonding and covalent bonding.
2. Lattice energy, Solvation energy, Born-Haber cycle and their applications.
3. Lewis structure and valence bond theory of covalent bonding.
4. Hybridization and shapes of atomic and molecular orbitals, bond parameters.
5. Concept of Resonance.
6. Fajan's rules and consequences of polarization.

Organic Chemistry

Module 1: Chemistry of aliphatic hydrocarbons with reaction mechanisms

After the completion of this module student will be able to understand and learn

- Different types of bonds breaking, types of reagents, nucleophilicity and basicity.
- In details the advanced aspects different types of organic reactions and their mechanisms.
- Chemistry of alkanes, alkenes and alkynes (Their method of preparations and different type of reactions)
- Chemistry of alkyl halides: Methods of preparation, properties and nucleophilic substitution reactions
- The detailed chemistry in terms of underlying principles and important applications of elimination and nucleophilic substitution reactions.
- Organometallic compounds of Mg (Grignard reagent) and uses in synthesis of organic compounds.

Module 2: Advanced Stereochemistry

After studying advanced stereochemistry, students will be able to understand and learn

- The concept of Chirality, Asymmetry, dissymmetry, Enantiomerism & Diastereoisomerism
- About Symmetry elements, optical activity, specific rotation, molar rotation. D/L, R/S, E/Z, syn/anti, cis/trans, meso/dl, threo/erythro nomenclature.

Practical:

After the completion of this course students will be able to

- Apply of some important organic reactions for the preparation of organic compounds

Physical Chemistry Module 1: Gaseous state

From this module they will be self-sufficient for understanding the KTG model of gas and Maxwell distribution. Student can surely able to clarify the concept of collision frequency and mean free path. Moreover, various type of gaseous speed and Barometric distribution law will also be clarified. Further, they will able to calculate the theoretical C_p and C_v value of any given molecule. The basic concept of viscosity especially its origin will be appeared in its crystal-clear form. Both mathematical and physical aspect of temperature and pressure dependence on viscosity will be on its forecast.

Module 2: Liquid State

Students can learn about Newtonian fluid (laminar flow). They can learn the detail theory for the experimental determination of viscosity by Ostwald's viscometer and stokes falling sphere method. They will know about phenomenon of capillary cation for both wetting and non-wetting liquid. They learn about for the experimental determination of surface tension of the liquid by capillary rise method, drop count method and drop count method. Finally, they can learn that the effect of temperature on the viscosity and surface tension. They further learn about surfactant and surface excess including the mechanism of cleansing action of soap. They will also know about the concept of micelle and its chemistry.

Module 4: *Experimental*

Students will able to handle the Ostwald viscometer and can measure the coefficient of viscosity of any liquid.

Students will able to handle the Stalagmometer and can measure the surface tension of any liquid.

SEC-Chemistry

Students will able to learn about the utility and of effectiveness various medicinal plant and They will learn about various separation tools for the extraction of natural product from of natural source viz. curcumin from turmeric, caffeine from tea etc.

Paper: MDC-1

WATER MANAGEMENT (WATER RESOURCE - ECONOMICS, GOVERNANCE AND POLICY):

- Upon completion of the course students will have sufficient knowledge about Water resources, sustainable development, Swach Bharat Mission and National Water Mission.

- Student will learn the importance of Sanitation and Hygiene (WASH). They will be able to understand the value and importance of water.
- Students gain sufficient knowledge about Effective water governance schemes, Water Governance in India, Salient features of National water policy 2012 and Jammu and Kashmir Water Resource (Regulation and Management) act 2010.
- The students can develop an understanding how to manage and use water resources for sustainable development.

Semester-I

Paper: MINOR-1- General Chemistry -1

Section A: Inorganic Chemistry-1 Module 1: Atomic Structure

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

1. Atomic theory and its evolution.
2. Quantum theory of atoms, concept of wave function.
3. Quantum numbers and their significance.
4. Shape of different orbitals.
5. Electronic configuration and their related rules.

Module 2: Chemical Bonding and Molecular Structure

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

1. Bonding between atoms and molecules; ionic bonding and covalent bonding.
2. Lattice energy, Solvation energy, Born-Haber cycle and their applications.
3. Lewis structure and valence bond theory of covalent bonding.
4. Hybridization and shapes of atomic and molecular orbitals, bond parameters.
5. Concept of Resonance.
6. Fajan's rules and consequences of polarization.

Section B: Organic Chemistry-1

Module 1: Fundamental of Organic Chemistry

Students will acquire knowledge on structure and shape of organic molecules, various effects of electronic displacement, and bond cleavage. They will learn about nucleophiles, electrophiles, reactive Intermediates, and strength of organic acids and bases. They will also learn about aromatic compounds and Huckel's rule.

Module 2: Stereochemistry

Students will get to know about conformations of acyclic and cyclic alkanes, Interconversion of Wedge Formula and way of representation of molecules. They will also learn about chirality, Isomerism and different nomenclature (D/L, R/S)

Module 3: Physical Chemistry

They will get a detail idea about various thermodynamic process viz. isothermal, isobaric, isochoric, adiabatic, reversible and irreversible process. They will learn on a detail about internal energy, heat content and work. They can also learn about Joule experiment and Joule-Thomson experiment and hence inversion temperature. They will learn about entropy and the qualitative idea on the spontaneity of any process. Further they will learn about Carnot cycle and will know about the principle behind the operation of heat engine, refrigerator, heat pump and can calculate the efficiency of the same. Students will also introduce about the third law of thermodynamics.

Students will know about various form of equilibrium constant K_p , K_c , K_a , K_N and K_f and their inter relation with one another. They will learn both qualitative and quantitative about the influence of various external parameter on the equilibrium. They further learn on qualitative treatment on Lechatelier principle.

Semester-II

Paper: MINOR-2- General Chemistry -2

Module 1: Inorganic Chemistry

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

1. Molecular orbital (MO) theory.
2. MO treatment of homonuclear diatomic molecules of 1st and 2nd periods and heteronuclear diatomic molecules such as CO, NO and NO^+ .
3. d block elements and their physical properties.
4. Transition metals and their ability to form complexes and stability of various oxidation states.
4. Lanthanoids, actinoids and their physical properties.

Module 2: Organic Chemistry

After the completion of this module student will be able to understand and learn.

- Chemistry of alkanes, alkenes and alkynes (Their method of preparations and different types of reactions)
 - Chemistry of aromatic hydrocarbons: Preparation and Reactions
- Electrophilic aromatic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction.

Module 3: Physical Chemistry

They will get a detailed qualitative idea on exothermic and endothermic reaction. They will learn about the calculation of the enthalpy of any reaction from simple addition subtraction method. They will also learn about various types of heat of reaction.

Students get introduce with Ostwald dilution law for weak electrolyte. They can get a detail idea about pH scale and can learn how to calculate pH for both weak and strong acid/ base, and also for various salt hydrolysis. They will learn the importance and mechanistic action of buffer solution and a detailed theory how to prepare a buffer of given any pH. Student will acquire knowledge on the theory of titration especially acid-base titration, and will surely learn how the choice of indicator play a key role during the titration.

Department of Mathematics

Course Outcome NEP

Major 01: Classical Algebra and Linear Algebra -1

Course Outcomes: This course will enable student to

- a) Describe the graphical representation of a polynomial, maximum and minimum values of a polynomial,
- b) Acquires the concept of symmetric functions,
- c) Use Newton's theorem to find the sums of power of roots, homogeneous products, limits of the roots of equation,
- d) Derive Sturm's theorem and its application.
- e) Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.
- f) Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix.
- g) Compute the characteristic polynomial, eigen values, eigenvectors, and eigen spaces, as well as the geometric and the algebraic multiplicities of an eigen value and apply the basic diagonalization result.
- h) Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization to obtain orthonormal basis.

Minor – 1: Differential Calculus and Integral Calculus

Course Outcomes: This course will enable the students to:

- a) To introduce fundamentals of the calculus in order to enhance application skill of students and prepare them to pursue higher analytical mathematics.
- b) By the completion of the course the students will be able to analysis the relationships between quantities such as rates of changes, area, volume, properties of curves) and their mathematical equivalents.
- c) The course will be able to equip the students with the tools of calculus to measure various quantities such as curvature, torsion, point motion in space etc.
- d) One of the main objectives of the course is to further deepen the fundamentals of analytical mathematics.

MDC – 1: Business Mathematics

Course Outcomes: This course will enable the students to:

- a) Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety of context
- b) Finding the extreme values of functions.
- c) Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economic and business.

Major – 2: Real Analysis – 1 and Ordinary Differential Equation – 1 Course

Outcomes: This course will enable the students to:

- a) Understand many properties of the real line \mathbb{R} , including completeness and Archimedean properties.
- b) Learn to define sequences in terms of functions from \mathbb{N} to a subset of \mathbb{R} .
- c) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
- d) Apply the ratio, root, and alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
- e) Learn basics of differential equations and mathematical modeling. f) Formulate differential equations for various mathematical models.
- g) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.
- h) Apply these techniques to solve and analyze various mathematical models.

Minor – 2: Ordinary Differential Equation and Partial Differential Equation Course

Outcomes: This course will enable student to:

- a) Learn basics of differential equations and mathematical modeling.
- b) Formulate differential equations for various mathematical models.

- c) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.
- d) Apply these techniques to solve and analyze various mathematical models.
- e) Formulate, classify and transform first order PDEs into canonical form.
- f) Learn about method of characteristics and separation of variables to solve first order PDE's.
- g) Classify and solve second order linear PDEs.
- h) Learn about Cauchy problem for second order PDE and homogeneous and non homogeneous wave equations.
- i) Apply the method of separation of variables for solving many well-known second order PDEs.

COURSE OUTCOME
FOR
4-YEAR U.G. NCCF (MAJOR IN BOTANY)
(SEMESTER – I & II)

PREAMBLE

4 Year Under Graduate Degree (Major) in Botany as per the guideline of the 4 year U.G. NCCF, a new curriculum has been formulated for 4 year under graduate course in Botany for the affiliated colleges under the Cooch Behar Panchanan Barma University.

The objective of any programme at Higher Education Institute is to prepare their students for the society at large. Acharya Brojendra Nath Seal College, Cooch Behar (Under Cooch Behar Panchanan Barma University) envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses.

This approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The NEP approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability. Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

This new curriculum of B.Sc. Botany major offer essential knowledge and technical skills to study plants in a holistic manner. Students would be trained in all areas of plant biology using a unique combination of core and elective papers with significant inter-disciplinary components. Students would be exposed to cutting-edge technologies that are currently used in the study of plant life forms, their evolution and interactions with other organisms within the ecosystem. Students would also become aware of the social and environmental significance of plants and their relevance to the national economy.

Acharya Brojendra Nath Seal College, Cooch Behar hopes the NEP approach of the B.Sc. Botany major will help students in making an informed decision regarding the goals that they wish to pursue in further education and life, at large.

VISION & MISSION

Mission:

- Equip the student with knowledge and skills of their chosen vocation.
- Inculcate values.
- Provide them opportunities for all, round growth and prepare them for life.

Vision:

- To equip the students with advanced knowledge and skills in their chosen vocation.
- To provide value-based education and opportunities to students.
- To help them to face challenges in life.
- To nurture a scientific attitude, temperament and culture among the students.
- To continually review, develop and renew the approach to build India of the Founder's dream.

GOALS AND OBJECTIVES

- To build a strong Academia-Industry bridge.
- To provide flexibility in the courses offered and proactively adapt to the changing needs of students and the society.
- To establish a centre for multidisciplinary activities.
- To mould individuals who would nurture the cultural heritage of our country and contribute to the betterment of the society.

PROGRAMME OBJECTIVE

According to this curriculum, the 1st year course containing two semesters have been proposed. The 1st semester will have one Major and one Minor course with one MDC and SEC. A course AEC is a compulsory course for undergraduate students. The new curriculum offers essential knowledge and technical skills to the students to study the plants in a comprehensive way. Students will gain the knowledge in all spheres of plant science using core and advance components of the subject. Students will have the exposure to the upgraded new generation technologies that are currently used in the field of plant science. In that way, they will gain plethora of knowledge in the subject itself and its implication in environmental and social perspective. This course covers both classroom and practical sessions. The students will be engaged in participatory and interactive activities. Candidates with curiosity in plants kingdom and environment and love in exploring exotic places as well as wish to work as researchers or professions like Botanist, Conservationist etc. can choose B.Sc. Botany course.

MAJOR 1 (ECONOMIC BOTANY AND ETHNOMEDICINE):

Programme Outcome:

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

1. Understand on the origin of the cultivated plants across the globe.
2. Gather botanical knowledge of different types of fruits, i.e cereals, pulses, vegetables, fruits, spices etc.
3. Understand about some plants yielding drugs, timber, fibre, rubber, beverages etc.
4. A preliminary knowledge of economic plants.
5. Will also have the general idea about ethno medicine and familiarize with some of the important medicinal plants of the region that is North Bengal.
6. The students will also imbibe concept of ecological concept on the botanical aspect. They will also have knowledge on population study.
7. Phytogeography of Eastern Himalaya in Particular and general principle of phytogeographical study will be thoroughly conceptualized.

Course Learning Outcomes:

The students will be made aware of the terrestrial biomes, phytogeographical division of India, Local vegetation. In economic botany they will learn about the Origin of cultivated plants, crop domestication, loss of genetic diversity. They will gather knowledge about cereals, legumes, sugars, starches, spices, natural rubbers, Dye and timber yielding plants. In ethnomedicine section they will learn about Importance of ethnomedicines in India, Various scientific name, family, parts used and uses of Plants used by ethnic people of North Bengal.

MAJOR 2 (ECOLOGY AND PHYTOGEOGRAPHY):

Programme Outcome:

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

1. The main aim of ecology is to understand the biotic and abiotic factors of living things in the environment.
2. Demonstrate a broad understanding of the processes that shape the distribution and abundance of organisms from the micro-habitat to the globe.
3. Recognize that the distribution of organisms is a product of positive and negative interactions within and across trophic levels, including competition, mutualism, predation, and parasitism.
4. Analyze interactions within the context of specific habitats and judge how the habitat shapes the distribution and abundance of species. Key factors that influence the habitat include climate, energy input, spatial/temporal complexity, and resource availability.
5. Evaluate the relationships among ecological interactions, habitat context and the evolution of organism form and function. Distinguish how the evolution of organism form and function influences ecological interactions and habitat tolerance and judge how ecological processes in turn shape the evolution of organism form and function.
6. Judge how organism function, habitat context and interactions within and across trophic levels influence the flow of energy and the movement and recycling of matter in communities and ecosystems.
7. Judge how ecological processes across all scales are affected by human activities, and apply basic ecological principles to meet societal resource management and conservation goals.

Course Learning Outcomes:

In this paper they will learn about basic concepts of Ecology, homeostasis, role of climate in soil change, hydrological cycle, water table, light, temperature and wind, biotic interactions, population ecology, ecosystems. In pharmacognosy section they will learn about pharmacopoeias, classification of plant drugs, secondary metabolites.

SKILL ENHANCEMENT COURSES:

SEC 1 (GARDENING):

Course Learning Outcomes:

Students will be made aware of the goals or missions of the garden and the best way to achieve them. Through field study they will be able to view these plants grow in nature and become very familiar with the biodiversity. This course will help you understand the environmental requirements of plants and the importance of selecting appropriate plantings as part of your design. Successful completion of theoretical and practical aspects of this course will ensure improvement of knowledge about gardening and create self-employment.

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

1. Understand how to set up a new garden and maintain the existing garden
2. Recognize different types of gardening tools and can select and manage equipment of gardening
3. Distinguish between formal and Informal Garden.
4. Select or design different types of plants for visual aesthetics
5. Study about types and styles of garden.
6. Can prepare a layout of any place and create a garden in that place

SEC 2 (GARDENING):

Course Learning Outcomes:

Students will be made aware of the goals or missions of the garden and the best way to achieve them. Through field study they will be able to view these plants grow in nature and become very familiar with the biodiversity. This course will help you understand the environmental requirements of plants and the importance of selecting appropriate plantings as part of your design. Successful completion of theoretical and practical aspects of this course will ensure improvement of knowledge about gardening and create self-employment.

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

1. Understand the importance of a nursery and how can manage it
2. Gather basic knowledge about tools, equipment and growing structures used in nursery for plant production
3. Develop technical knowhow on the method of propagation
4. Gather knowledge about how to prepare the root stocks
5. Learn about different methods of cutting, budding and layering techniques

MULTI DISCIPLINARY COURSE:

MDC 1 (CULTIVATION OF MEDICINAL PLANTS):

Course Learning Outcomes:

- Students will gain knowledge about the scope and importance of medicinal plants
- Students will learn about the importance of conserving endangered and endemic medicinal plants, including the ecological, economic, and cultural significance of conservation efforts.
- Students will develop skills in propagating medicinal plants through both seed-based and vegetative methods, including understanding the principles behind successful propagation and practical experience in propagation techniques.
- Students will be able to prepare and manage a nursery for medicinal plants, including understanding the requirements for optimal growth, maintaining proper environmental conditions, and managing pests and diseases.
- Students will learn the techniques for transplanting medicinal plants from the nursery to field settings and harvesting them at the appropriate stage of growth to maximize their medicinal properties.
- Students will understand the importance of post-harvest care in preserving the quality and efficacy of medicinal plants, including drying, processing, storage, and packaging techniques.
- Students will acquire knowledge of cultivation techniques and cultural practices specific to various medicinal plants listed in the syllabus, including Chatim, Kalomegh, Sarpagandha, Haritaki, Tulshi, Basak, Ginger, and Turmeric. This includes understanding soil requirements, climate preferences, irrigation needs, fertilization, pest and disease management, and harvesting methods specific to each plant.
- Through practical exercises, fieldwork, and projects, students will gain hands-on experience in applying the knowledge and techniques learned in the classroom to real-world scenarios, fostering skills in observation, problem-solving, and critical thinking in the context of medicinal plant cultivation and management.

COURSE OUTCOME FOR NCCF ZOOLOGY

SEMESTER-1

MAJOR-1: Animal Diversity: Non-Chordates and Chordates

Upon successful completion of this course, students will be able to:

1. **Understand and Apply Classification Systems:** Gain a deep understanding of the classification of the animal world, from Protozoa to chordates, and apply this knowledge to identify and describe unique features of each taxonomic group. They will also be able to construct taxonomic keys and be able to identify poisonous and non-poisonous snakes through keys.
2. **Comprehend Structural and Functional Patterns:** Understand the unique structural and functional patterns of various animal groups, including body symmetry, coelom types, and specific systems such as the canal system in Porifera, the water vascular system in *Asterias* sp., and the accessory respiratory organs in fishes.
3. **Appreciate Evolutionary Relationships:** Understand the evolutionary significance of various animal groups and phenomena, such as Onychophora, retrogressive metamorphosis in *Ascidia*, and concepts like neoteny and paedomorphosis.
4. **Recognize and Respond to Environmental Interactions:** Understand the interaction of animals with their environment, such as coral reef formation and conservation etc.
5. **Understand Specialized Animal Features:** Gain knowledge about specialized features in animals, such as the poison apparatus and biting mechanism of poisonous snakes, and the concept of echolocation in bats.

This course outcome is designed to ensure that students gain a comprehensive understanding of the diversity of animal life, from non-chordates to chordates, and are able to apply this knowledge in their future studies and careers in the field of Zoology. The course is taught at a difficulty level of 100 and uses a Lecture-Practical-Tutorial (LPT) mode of instruction. The course carries 4 credits.

MDC-1: ANIMAL DIVERSITY

Upon successful completion of the “Animal Diversity” course, students will be able to:

1. **Understand Animal Diversity:** Comprehend the general characteristics of various animal groups from both non-chordates and chordates, and understand their unique features and life cycles.
2. **Comprehend Biological Processes:** Understand key biological processes such as the canal system in Sycon, polymorphism in Hydrozoa, metamerism in Annelida, and the water vascular system in starfish.
3. **Recognize Adaptations and Behaviors:** Identify and understand various adaptations and behaviors in animals, such as parasitic adaptations in Nematoda, social life in insects, migration in fishes, and parental care in Amphibia.
4. **Understand Specialized Animal Features:** Gain knowledge about specialized features in animals, such as respiration in *Pila globosa*, dos and don'ts after snake bite, flight adaptations in birds, and dentition in mammals.

This course outcome is designed to ensure that students gain an overview of the diversity of animal life, and are able to apply this knowledge in their future studies and careers in the field of Zoology. Topics like dos and don'ts after snake bite will increase their awareness on wildlife and society which they will be able to spread further among common people. The course is taught at a difficulty level of 100 and uses a Lecture & Tutorial mode of instruction. The course carries 3 credits for theory.

SEC- Wild Life Conservation & Management

Upon successful completion of this practical course, students will be able to:

1. **Identify and differentiate** various species of flora and fauna, including arthropods, fishes, amphibians, reptiles, birds, and mammals. They will be able to provide reasons for their identifications, enhancing their understanding of biodiversity.
2. **Understand and apply** various techniques and equipment used in wildlife observation and management. This includes making field notes and datasheets,

planning wildlife management strategies, and conducting investigations for funding agencies.

3. **Demonstrate proficiency** in wildlife photography, using different types of cameras and binoculars, setting up camera traps, and using an altimeter, pedometer, and field compass. This will enable them to document and share their findings effectively and develop the skill for entrepreneurship.
4. **Operate sound recording devices and media players**, and perform activity recording and weight measurement. This will equip them with the necessary skills to monitor and study wildlife behavior and characteristics.
5. **Develop a holistic understanding** of wildlife and its conservation, fostering a sense of responsibility towards preserving biodiversity.

This course will provide students with hands-on experience, enhancing their practical skills and preparing them for future roles in wildlife conservation and research or beginning entrepreneurship.

SEC- Aquarium Fish Keeping and Management

Upon successful completion of this practical course, students will be able to:

1. **Understand Aquarium Fish Keeping:** Gain knowledge about the origin and history of fish keeping, understand the potential scope of the aquarium fish industry, and identify various species of aquarium fishes.
2. **Appreciate Biodiversity:** Recognize the common characters and sexual dimorphism of various freshwater and marine aquarium fishes. Understand the differences between egg-laying and live-bearing aquarium fishes.
3. **Comprehend Reproductive Biology:** Learn about the reproductive biology of ornamental fishes, including their reproductive organs, sexual maturity, and breeding habits.

In conclusion, this course not only provides students with a comprehensive understanding of aquarium fish keeping, but also equips them with practical skills that are highly valued in the job market. The ability to identify and understand the biology of various aquarium fishes, coupled with the knowledge of their breeding habits, can open up opportunities in the aquarium fish industry, wildlife conservation, and research fields. This course, therefore,

significantly enhances the employability of the students, preparing them for a variety of roles in the aquatic life sector.

SEMESTER-2

MAJOR-2: Fundamentals of Cell Biology

Upon successful completion of the “Fundamentals of Cell Biology” course, students will be able to:

1. **Understand Cellular Structures and Functions:** Comprehend the structures and purposes of basic components of prokaryotic and eukaryotic cells, including macromolecules, membranes, organelles, and intra-cellular structures. This includes practical skills such as studying human karyotypes (normal and abnormal).
2. **Comprehend Energy Generation and Utilization:** Understand the functioning of cellular components to generate and utilize energy in cells, including the concepts of the chemi-osmotic hypothesis and membrane transport mechanisms.
3. **Recognize Cell Adhesion Molecules and Cytoskeletons:** Identify and list the distinguishing properties of cell adhesion molecules (CAMs) and cytoskeleton components, including microtubules, microfilaments, and intermediate filaments.
4. **Understand Cell Division and Genetics:** Describe the major events of cell division, including mitosis and meiosis, and understand the cell cycle and its regulation. This includes practical skills such as studying various stages of meiosis in grasshopper testis, preparing temporary stained squashes of onion root tips to study various stages of mitosis, and preparing permanent slides to show the presence of Barr bodies in human female blood cells/cheek cells.
5. **Comprehend Cellular Communication:** Understand the signalling pathways in cellular communication, including membrane receptor and nuclear receptor pathways.

This course outcome is designed to ensure that students gain a comprehensive understanding of the fundamental aspects of cell biology, and are able to apply this knowledge in their future studies and careers in the field of Zoology. The course is taught at a difficulty level of

100 and uses a Lecture-Practical-Tutorial (LPT) mode of instruction. The course carries 4 credits for theory and 2 credits for practical.

SEC- Wild Life Conservation & Management

Upon successful completion of this practical course, students will be able to:

1. **Track and identify wildlife:** Utilize techniques such as radio isotopes, radio collaring, GPS, GIS, and remote sensing for tracking. Apply wildlife genetics knowledge and indirect signs for animal identification.
2. **Manage habitats and invasive species:** Understand the impact and removal of invasive alien species and manipulate habitats for food, water, and shade improvement.
3. **Conduct wildlife census:** Plan and execute a wildlife census using various counting techniques and indirect signs.
4. **Use software tools in wildlife sciences:** Apply Distance software for creating capture matrix and other software used in wildlife sciences for data analysis.
5. **Perform fieldwork:** Conduct trail/transect monitoring for abundance and diversity estimation of mammals/birds using direct and indirect evidences.

This course will provide students with hands-on experience, enhancing their practical skills and preparing them for future roles in wildlife conservation and research.

SEC: Aquarium Fish Keeping and Management

Upon successful completion of this practical course, students will be able to:

1. **Understand Food, Feeding, and Nutrition of Aquarium Fishes:** Students will learn about the use of live fish feed organisms, the preparation and composition of formulated fish feeds, the qualities of a good artificial fish feed, and the nutritional requirements of fishes. They will also gain hands-on experience in live feed culture for fishes.

2. **Set Up and Maintain Home Aquariums:** Students will learn about the classification of aquaria based on salinity, temperature range, and species selection. They will understand the concept of stocking density and gain practical skills in setting up both freshwater and marine aquariums.
3. **Handle Fish Transportation and Aquarium Equipment:** Students will learn about live fish transport, fish handling, and packing and forwarding techniques. They will also become familiar with various aquarium equipment and their uses.

In conclusion, this course equips students with the knowledge and skills necessary to maintain an aquarium, care for a variety of fish species, and understand their feeding and nutritional requirements. These skills are highly valued in the job market, opening up opportunities in the aquarium fish industry, wildlife conservation, and research fields. This course, therefore, significantly enhances the employability of the students, preparing them for a variety of roles in the aquatic life sector.

DEPARTMENT OF PHYSIOLOGY

COURSE OUTCOME UNDER NCCF SEMESTER (1ST & 2ND)

MAJOR: PHYSIOLOGY

Programme Outcomes:

- The student will have comprehensive understanding of the structure and function of the human body along with elementary understanding of the clinical applications of physiology.
- Plan and execute physiology-related laboratory experiments or field investigations, analyses and interpret the collected information using appropriate methods.
- Enhance the capability of students to answer and explain the urgings that they face in next level of studies.

MINOR: NA

SEC (MEDICAL PATHOLOGY)

Programme Outcomes:

- Student will be able to demonstrate general concepts regarding haematology, microbiology, immunology, clinical biochemistry, common infectious and non-infectious diseases together with diagnostic and therapeutic modalities.
- The student will gain basic idea regarding pathological tests as well as techniques commonly used for disease diagnostic purpose.
- The student will learn good laboratory practices & ethics, bio-medical waste disposal and management.

MDC (NUTRITIONAL PHYSIOLOGY)

Programme Outcomes:

- After completion of the course the student will gain a knowledge on basic constituents of food and their nutritional significances, Balance diets and malnutrition and obesity.
- Further the student will have an idea on dietary requirements and nutritional roles of carbohydrate, protein, lipid, and other nutrients.
- The student will understand the role of vitamins and minerals on physiological functions along with deficiency symptoms and hypervitaminosis.

VAC: NA

AEC: NA