



Sammilani Mahavidyalaya

(NAAC ACCREDITED B++)
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Ref. No.....

Date

Programme Outcomes, Programme Specific Outcomes And Course Outcomes (CCF)

Programme Outcomes

- Bachelor of Arts
- Bachelor of Science
- Bachelor of Commerce

Programme Specific Outcomes And Course Outcomes

- ❖ Department of Bengali
- ❖ Department of Education
- ❖ Department of English
- ❖ Department of History
- ❖ Department of Philosophy
- ❖ Department of Political Science
- ❖ Department of Sanskrit
- ❖ Department of Film Studies
- ❖ Department of Commerce
- ❖ Department of Chemistry
- ❖ Department of Computer Science
- ❖ Department of Geography
- ❖ Department of Mathematics
- ❖ Department of Microbiology
- ❖ Department of Physics
- ❖ Department of Zoology
- ❖ Department of Botany

SAMMILANI MAHAVIDYALAYA

Programme Outcomes, Programme Specific Outcomes & Course Outcomes **Under CCF (Curriculum And Credit Framework)**

Programme Outcome (PO)

(Under NEP-CCF System)

The National Education Policy (NEP) 2020 aims at the role of higher education in promoting human and social well-being and focus on fundamental principles for functioning of individual educational institutions.

The NEP Policy has certain basic guidelines for holistic development of the students by providing relaxation and flexibility in choice of programmes, so that the students can choose their own paths in life according to their liking and capability. An advanced and updated methodology has been also adopted for overall development of the specially abled students. To make the education system multidisciplinary and holistic the concept of liberal arts has been implemented across sciences, social sciences, arts, humanities, and sports curricula. The syllabus for programmes are so framed that they emphasize on conceptual understanding, critical and logical thinking to encourage decision-making and innovation, ethical and constitutional values, attainment of life skills such as communication, teamwork and leadership. Emphasis has been also given to the ancestral knowledge systems of India culminated in its rich, diverse, ancient and modern cultures, languages, and traditions. The main curriculum framework has the following basic components.

Major discipline is the discipline or subject of main focus and the degree is awarded by the affiliating University in that discipline.

Minor discipline or minor subjects help a student to gain a broader understanding beyond the major discipline.

Interdisciplinary Courses enhance the thinking ability of the students in different fields. These courses are conducted as Inter-Department programmes which run parallel to the major and minor courses.

Ability Enhancement Courses (AEC) help the students to achieve competency in a Modern Indian Language (MIL) and in English language with special emphasis on the writing ability and communication skills.

Skills Enhancement Courses (SEC) courses aim at imparting practical skills, hands-on training and development of soft skills to enhance the employability of students.

Common Value Added Courses bring in career skills to enhance the subject knowledge of the students.

Program Outcome is the summation of the knowledge, skills, abilities and attitudes of the students at the end of a degree program. The general aspects of the program are covered describing the depth of knowledge and skills a student would acquire at the end of the program.

Program Specific Outcomes specifically aim at a particular degree program in terms of Humanities, Science, Commerce etc. that a student takes up for acquiring knowledge and skills. This not only gives a specific direction to the career of the particular individual but also makes him a contributor to the development of society.

Course Outcomes are the resultant knowledge skills that the students acquire at the end of the course. It defines the cognitive processes and is precise and quantifiable information that a student will acquire by the end of a course.

The institution outlines POs and PSOs for all programmes and COs for each course following the prescribed syllabus in different subjects of the affiliating University. The teachers design the lesson plan accordingly to incorporate the teaching, learning and assessment strategies in such a way as to give enough weightage to each of the specified learning activities and attainment of outcomes.

Programme Outcomes

Bachelor of Arts

The humanities or arts stream is well-diversified and multi-disciplinary. As a student of humanities, one can pursue higher study or research work in various fields of interest. So, humanities students have bright future as far as their career is concerned. A student of Bachelor of Arts can also crack competitive examinations of UPSC, state PSC, SSC Combined Graduate Level, IBPS, RRC etc. for various state/central Govt. jobs and also can join the private sector.

Humanities or Arts students have the following common career opportunities:

❖ **PO1.** Understanding of ethical and human values, culture and sense of social service

- ❖ **PO2.** Skill of effective communication and language
- ❖ **PO3.** Independent learning of appropriate methodologies
- ❖ **PO4.** Develop critical and analytical thinking to assess issues
- ❖ **PO5.** Expertise in respective fields, work with self-esteem, self-reliance, self-reflection and creativity to face adversities in the work and personal life.

Programme Outcomes

Bachelor of Science

Science graduates (Honours or General) can end up in teaching, research, higher education in advanced engineering and technological field, laboratory work, chemical industry or might join non specialized fields like banking sector, defence services, state/central government administrative jobs, etc.

- ❖ **PO1.** Explanation of basic scientific principles, procedures and methods.
- ❖ **PO2.** Inculcate the process of scientific thinking and awareness among the student.
- ❖ **PO3.** Ability to communicate the thoughts and outcomes of a scientific innovation or experiment.
- ❖ **PO4.** Ability to handle any unprecedented situation by critical analysis of the scenario and finding out a feasible solution.
- ❖ **PO5.** Understanding the issues related to nature and environmental contexts and sustainable development.

Programme Outcomes

Bachelor of Commerce

B.Com. is an undergraduate programme which deals with the study of accounting and finance, economics, business policy, business administration and taxation etc. Hence students pursuing B. Com. have a golden chance to have jobs in a wide variety of business and industry.

- ❖ **PO1.** Students of this course acquire the fundamental knowledge on an array of subjects like accounting, finance, auditing, taxation, economics, management, business communication, business laws, entrepreneurship, economics, business ethics, applications of mathematics and statistics in business and commerce, marketing, & human resource, e-commerce, basics of information technology, etc.

DEPARTMENT OF BENGALI
Programme Specific Outcomes

PSO1: Students will be Graduates with Bengali Honours degree after completing Bengali Honors course of 6 semesters in three years.

Students will grasp the literary essence of Bengali Classics and Texts to boost further studies. They can pursue higher studies in Bengali literature, Comparative literature, Linguistics, art and culture etc, after completing the course.

PSO2: Students can get a good foothold in Bengali grammar with a penchant towards creative-writing. Students recognize and appreciate the cultural, social, historical contexts in which Bengali literature has evolved and how it reflects broader cultural heritage.

They can acquire research aptitude through various seminars, extempore, debates and projects during the entire course and go for Research programs.

PSO3: Through "Skill Enhancement Course", students learn Computer basics through MS Word, Excel, Corel DRAW, In Design, Page Maker etc which can help them to develop skill on design, publication and production. Students can pursue B.Ed and after clearing TET, UPSC examinations, NET/SET etc. they can avail School/College teachership or Government jobs.

PSO4: After completion of this course, students can join the course of Art and Culture, Journalism, Fine Arts Mass Communication, Acting and Performing Arts etc. to acquire further knowledge and can get into various professions involving these fields.

PSO5: Apart from above fields, through completion of Bengali Advance/General course, students can always choose professions like Translators, Interpreters, Proof readers, Proof-Readers, Editing & Content-writing, Travel & Tourism etc.

PSO6: Other fields where students can involve themselves for future careers include Advertising & Marketing, Event Management, Human Resource, Retail etc.

Course Outcomes

Semester	Course Title	Course Outcome
SEM I CC-1	Bengali Literature in the Ancient-Medieval Ages (UPTO 1800 AC)	CO1 ● Students understand the

	<p>Unit – I: BANGLA BHASA O SAHITYER ITIHAS, CHARJAPAD, SHREEKRISHNA KIRTAN</p> <p>Unit–II: ANUBADSAHITYA, BOISHNOB PADABALI, CHARITSAHITYA</p> <p>Unit–III: MANGALKABYA, PRANOYUPAKHAYAN, SAKTOPADABALI</p>	<p>primary/basic concept on the origin of Bengali Literature & Language</p> <ul style="list-style-type: none"> ● They get acquainted with the trends of Bengali literary practices prevalent in the Ancient-Medieval Period ● They form concepts on the nature of bengalis’ literary practices before it started in Bengal
IDC-1	<p>Kotha Sahitya O Natok</p> <p>Unit – I: Uponyash-Palli Samaj</p> <p>Unit – II: Choto Galpo-Ekaler Galpo Sanchyan</p> <p>Unit–III: Natok-Nabanno</p>	<p>IDC1: Kotha Sahitya O Natok</p> <ul style="list-style-type: none"> ● Students get an idea on the current form of Bengali language, it’s different elements and how it is constructed ● They get a thorough understanding of the internal structure of the Bengali language
SEC-1	<p>Mudran O Prokasona</p> <p>Unit–I: Pandulipi Prostuti, Sankolon etc</p> <p>Unit–II: Bangla Banan O WB Bangla Adademi Banan Bidhi</p> <p>Unit–III: Pagemaker, Corel draw etc.</p> <p>Proof Correction, Binding, Marketing etc.</p>	<p>SEC1: Mudran O Prokasona</p> <ul style="list-style-type: none"> ● Students get an understanding about the dynamic nature of the first phase of modern Bengali literature ● They become aware of how renaissance took place centering around literature <p>They acquire knowledge on the development of bengali prose, drama and periodicals</p>
SEM II CC-2	<p>Bengali Linguistics</p> <p>Unit–I: DHANI, BARNA, etc</p> <p>Unit–II: BANGLABHASA, DHANIPORIBARTANER RITI, UPOBHASA</p> <p>Unit–III: BACHAN, LINGO, PURUSH, SAMASH-etc</p>	<p>CO2</p> <ul style="list-style-type: none"> ● Students understand the trend of evolution of Bengali poetry from ancient times to modern times ● They learn to read texts related to literary fictions, essays and dramas in an analytical way
IDC-2	<p>Kotha Sahitya O Natok</p> <p>Unit – I: Uponyash-PalliSamaj</p> <p>Unit – II: Choto Galpo-Ekaler Galpo Sanchyan</p> <p>Unit–III: Natok-Nabanno</p>	<p>IDC2: Kotha Sahitya O Natok</p> <ul style="list-style-type: none"> ● They understand the speciality of all authors in Bengali Literature ● They learn about the direction of modern Bengali language practice

SEC-2	<p>Baboharik Bangla 1</p> <p>Unit – I: Chithipotro Rachana, Dinopanji Rachana</p> <p>Unit–II: Grantha Somalochona etc</p> <p>Unit – III: Anubad, Anubader Bivinno Prokar, Bangla theke Engregi Anubad</p>	<p>SEC2</p> <ul style="list-style-type: none"> Students develop an analytical viewpoint to the novels written by Rabindranath Tagore, Sarat Chandra Chattopadhyay, Manik Bandopadhyay and Mahashweta Devi <p>They learn to critically evaluate the texts</p>
SEM III CC-3	<p>Modern Literature Part 1</p> <p>Unit –I: GADYAOPRABANDHA</p> <p>Unit II: KABYAKABITA O NATAK-PRAHASAN</p> <p>Unit–III: UPANAYAS OCHHOTOGALPO</p>	<p>CO3</p> <ul style="list-style-type: none"> Students get acquainted to the practical basics of book printing and publishing They learn about how books are written, printed, bound and published
IDC-3	<p>Kotha Sahitya O Natok Unit – I: Uponyash-Palli Samaj</p> <p>Unit – II: Choto Galpo- E kaler Galpo Sanchyan</p> <p>Unit–III: Natok - Nabanno</p>	<p>IDC3: Kotha Sahitya O Natok</p> <ul style="list-style-type: none"> They get acquainted with the trends of Bengali literary practices prevalent in the Ancient-Medieval Period They form concepts on the na Bengal
SEC-3	<p>Baboharik Bangla 2</p> <p>Unit – I: Galpo Surto Theke Kahini Nirman, Chitro nattoo Nirman</p> <p>Unit–II: Protibad o Rachana</p> <p>Unit – III: Sahityo o cholochoittro-Somporko</p>	<p>SEC3: Baboharik Bangla 2</p> <ul style="list-style-type: none"> Students get an idea on the current form of Bengali language, it's different elements and how it is constructed <p>Sahityo o cholochittro-Somporko</p>
SEM III CC-4	<p>Poetry, Literary Fiction, Drama, Prose, Essay Unit–I: KABITA</p> <p>Unit–II: KATHASATHIYA CHHOGALPO</p> <p>Unit–III: NATAK O PRABANDHA</p>	<p>CO4</p> <ul style="list-style-type: none"> Students understand the trend of evolution of Bengali poetry from ancient times to modern times They learn to read texts related to literary fictions.
SEM IV CC-5	<p>Premodern History of Bengali Literature</p> <p>Unit–I: BAISHNOB PADABALI</p> <p>Unit–II: CHANDI MANGAL</p> <p>Unit–III: SAKTOPADABALI</p>	<p>CO5</p> <ul style="list-style-type: none"> Students develop concepts on the unique nature of various modern Bengali essays They form an analytical approach to certain texts of essays

<p>SEM IV</p> <p>CC-6</p>	<p>BANGLAGOYENDA SAHITYA, KALPOBIGAYAN Unit-I: sajarurkanta Unit-II: sankusamagra Unit -III: sobbhuture</p>	<p>CO6</p> <ul style="list-style-type: none"> ● Students learn to improve their writing proficiency through writing stories, essays and various letters ● They tend to develop concepts regarding Roman and IPA ● They learn about the proper rules of Bengali spelling
<p>SEM IV</p> <p>CC-7</p>	<p>BANGLAKATHASAHITYA Unit-I: KAPALKUNDALA unit- II: padma nadirmaghi unit-III: CHOTOGALPO</p>	<p>CO7</p> <ul style="list-style-type: none"> ● Students develop an overall understanding of the history of Bengali Theater <p>They gain knowledge about the drama</p>

DEPARTMENT OF EDUCATION
Programme Specific Outcomes

In the 4 years B.A. Major course in Education, there will be 8 Semesters. The curriculum consists of 22 DSC/Core Courses, 3 Skill Enhancement Courses (SEC) 1 Internship and 2 Dissertation/Research work.

PSO1. Students pursuing Education Major course will learn to use their knowledge in understanding the philosophy behind various educational policy and planning from the ancient period to modern age.

PSO2. They will develop advanced critical thinking skills along with teaching aptitude.

PSO3. They will develop abilities for understanding the history of education.

PSO4. Students will be able to use and analyze their newly acquired knowledge in various fields of social science as Education is a multi-disciplinary subject.

PSO5. Knowledge of Educational psychology along with the knowledge of Psychology of adjustment and Guidance and Counselling will prepare them to deal with behaviors of human being and enable them to pursue their career.

PSO6. They will be well aware of Information and Communication technology and hence will acquire ICT skills.

PSO7. They will be aware of philosophies and principles of education as put forward by Great Educators.

PSO8. They will be aware of basic communication skills.

PSO9: They will have a deeper understanding of different aspects of democratic citizenship.

PSO10: They will have general awareness about basics of computer, hardware software and cyber-crime.

Course Outcomes of Major Course

Semester	Course Title	Course Outcome
1	EDC/H/CC – 1/1 (For Major Introduction and Philosophical Foundation of Education)	CO1 • Students understand the meaning, nature, scope and aims of education. • They are able to explain the factors of education and their interrelationship. • They become acquainted with the concept of Child-Centricism and play-way in education.
	EDC/H/SEC/1/1 Communication Skill	CSEC 1 • Students will understand the basic elements of Communication

		<ul style="list-style-type: none"> • They will acquire Listening Skills. • They will acquire Speaking Skills.
2	EDC/H/CC/2/2 Psychological Foundation of Education	CO2 <ul style="list-style-type: none"> • Students will understand the meaning of Psychology and be acquainted with its different aspects. • They will know the patterns of different aspects of human development and relate this knowledge with education. • They will be acquainted with the cognitive approach of development and thus understand the process and factors of cognition.
	EDC/H/SEC/2/2 Aspect of Democratic Citizenship	CSEC2 <ul style="list-style-type: none"> • They will have an idea about their duties as citizens • Students will have an idea about their rights as citizens. <ul style="list-style-type: none"> • They will have an idea about child violence and child rights. • They will have an idea about domestic violence and domestic right
3	EDC/H/CC/3/3 Guidance and Counselling	CO3 <ul style="list-style-type: none"> • Students will know the concept of guidance. • They will know various types of Guidance. • They will know the basic concept of Counselling.
	EDC/H/CC/4/3 Sociological Foundation of Education	CO4 <ul style="list-style-type: none"> • Students will understand the relation between Sociology and Education. nature, and scope of Sociology of education. • They will be able to explain the concept of Social Groups and Socialization process. • They will be able to enable the students to understand the concept of social change and social interaction in education. • They will become aware of social Communication in Education.
	EDC/H/SEC Computer Application	CSEC3 <ul style="list-style-type: none"> • They will be familiarized with the basics of computer. • They will have the ability to know the software, hardware and networking. • They will have the ability to know the concept of Cyber Crime.
4	EDC/H/CC/5/4 Educational Organization and Planning	CO5 <ul style="list-style-type: none"> • They will develop the concept of an ideal organization in educational institutions. • They will understand the different aspects of planning.
	EDC/H/CC/6/4	CO6

	History of Education	<ul style="list-style-type: none"> • They will be acquainted with the salient features of education in India during ancient and medieval times. • They will be acquainted with the development of education in British India. • They will be acquainted with the significant points of selected education commissions & national policy of education in independent India.
	EDC/H/CC/7/4 Technology in Education	CO7 <ul style="list-style-type: none"> • They will develop an understanding of educational technology. • Students will be acquainted with the system approach. • They will get acquainted with the instructional techniques and different models of teaching. • They will develop an understanding of ICT & e-learning.
	EDC/H/CC/8/4 Great Educators	CO8 <ul style="list-style-type: none"> • They will develop an understanding of educational ideas of Indian and Western Educators. • They will understand pedagogical concepts given by Indian and Western educational thinkers

Under-graduate Course Structure (MDC - EDUCATION) Based on NEP – 2020

In the 3 years B.A. MDC course in Education, there will be 6 Semesters. The curriculum consists of 8 Core Courses - 1, 8 Core Courses – 2, 6 Minor courses, 3 Inter Disciplinary Courses.

PSO1: Students pursuing Education MDC course will learn to use their knowledge in understanding the philosophy behind various educational policy and planning from the ancient period to modern age.

PSO2: Students will gain an understanding of communication skill.

PSO3: Students will understand the psychological principals underlying teaching learning process.

PSO4: Students will understand the importance of guidance and counselling in education setting.

PSO5: They will develop abilities for understanding the history of education.

PSO6: They will gain knowledge about educational policy framing and school organization.

Course Outcomes

Semester	Course Title	Course Outcome
1 & 3	M-1/ M-2 &EDC/MD/CC/1/1&/2/1 Introduction & Philosophical Foundation of Education	CO1 <ul style="list-style-type: none"> • Students understand the meaning, nature, scope and aims of education. • They are able to explain the factors of education and their interrelationship. • They become acquainted with the concept of Child-Centricism and play-way in education
1/2/3	EDC/MD/CC/2/1 Communication Skill	CSEC1 <ul style="list-style-type: none"> •Students will understand the basic elements of Communication. • They will acquire Listening Skills. • They will acquire Speaking Skills.
2 & 4	M-1/M-2 &EDC/MD/CC/1/2& 2/2 Psychological Foundation of Education	CO2 <ul style="list-style-type: none"> • Students will understand the meaning of Psychology and be acquainted with its different aspects. • They will know the patterns of different aspects of human development and relate this knowledge with education. • They will be acquainted with the cognitive approach of development and thus understand the process and factors of cognition.
3	EDC/MD/1/3/ CC/2/3 Guidance and Counselling	CO3 <ul style="list-style-type: none"> • Students will know the concept of guidance. • They will know various types of Guidance. • They will know the basic concept of Counselling.
4	EDC/MD/CC/1.1/4 /2.1/4 Educational Organization and Planning	CO4 <ul style="list-style-type: none"> • They will develop the concept of an ideal organization in educational institutions. • They will understand the different aspects of planning.
	EDC/MD/CC/1.2/4/ /2.2/4 History of Education	CO5 <ul style="list-style-type: none"> • They will be acquainted with the salient features of education in India during ancient and medieval times. • They will be acquainted with the development of education in British India. • They will be acquainted with the significant points of selected education commissions &

		national policy of education in independent India.
1/2/3	IDC EDC/H/IDC Inclusive Education	CO IDCO <ul style="list-style-type: none"> • They will understand the meaning of Inclusion and exclusion. • They will know the types of exclusion and their causes. • They will know how to bring about inclusion in different spheres

DEPARTMENT OF ENGLISH
Programme Specific Outcomes

PROGRAMME SPECIFIC OUTCOME:

1. Critical thinking
2. Argumentation
3. Close Reading Skills
4. Understanding of Literary Tradition
5. Cultural and Historical Awareness/ Contextualization
6. Comparative Analysis
7. Interdisciplinary Connections
8. Theoretical Knowledge
9. Creative Writing
10. Analytical Writing
11. Effective Written and Oral Communication
12. Social Interaction
13. Ethics
14. Aesthetic Appreciation
15. Self-directed and Lifelong Learning
16. Specific Indian and other Postcolonial Histories and Contexts
17. Women's Movement and Artistic Awareness
18. Cultural Sensitivity and Global Awareness

Course Name	Topic	Course Outcome
DSC 1	INTRODUCTION TO ENGLISH LITERATURE (POETRY)	TO IMPART PRIMARY KNOWLEDGE ABOUT ENGLISH POETRY
DSC 2	INTRODUCTION TO ENGLISH LITERATURE (PROSE)	TO IMPART PRIMARY KNOWLEDGE ABOUT ENGLISH PROSE
DSC 3	INTRODUCTION TO ENGLISH LITERATURE (DRAMA)	TO IMPART PRIMARY KNOWLEDGE ABOUT ENGLISH DRAMA
DSC 4	AMERICAN LITERATURE – I	TO IMPART PRIMARY KNOWLEDGE ABOUT AMERICAN LITERATURE
DSC 5	POPULAR LITERATURE	TO IMPART PRIMARY KNOWLEDGE ABOUT POPULAR LITERATURE

DSC 6	INTRODUCTION TO INDIAN WRITING IN ENGLISH	TO IMPART PRIMARY KNOWLEDGE ABOUT INDIAN WRITING IN ENGLISH
DSC 7	ENGLISH POETRY – I	TO IMPART KNOWLEDGE ABOUT ENGLISH POETRY FROM SPENSER TO PRE-ROMANTICS
DSC 8	ENGLISH DRAMA	TO IMPART KNOWLEDGE ABOUT ENGLISH DRAMA
DSC 9		TO IMPART KNOWLEDGE ABOUT ENGLISH PROSE FROM ROMANTICS TO MODERN
DSC 10	ENGLISH PROSE – 1	TO IMPART KNOWLEDGE ABOUT ENGLISH POETRY FROM ROMANTIC TO MODERN
DSC 11	ENGLISH PROSE – II	TO IMPART PRIMARY KNOWLEDGE ABOUT ENGLISH PROSE FROM VICTORIAN TO MODERN
DSC 12	LITERARY THEORY – I	TO IMPART PRIMARY KNOWLEDGE ABOUT FUNDAMENTALS OF WESTERN LITERARY THEORIES
DSC 13	INDIAN WRITING IN ENGLISH – I	TO IMPART ADVANCED KNOWLEDGE ABOUT INDIAN WRITING IN ENGLISH
DSC 14	MODERN EUROPEAN DRAMA	TO IMPART KNOWLEDGE ABOUT MODERN EUROPEAN DRAMA

DSC 15	AMERICAN LITERATURE – II	TO IMPART ADVANCED KNOWLEDGE ABOUT AMERICAN LITERATURE
DSC 16	INDIAN WRITING IN ENGLISH - II (TRANSLATION)	TO IMPART KNOWLEDGE ABOUT INDIAN WRITING IN ENGLISH TRANSLATION
DSC 17	LITERARY THEORY – II	TO IMPART ADVANCED KNOWLEDGE ABOUT WESTERN LITERARY CRITICISM
DSC 18	WOMEN'S WRITING	TO IMPART KNOWLEDGE ABOUT WOMEN'S WRITING
DSC 19	AUTOBIOGRAPHY	TO IMPART KNOWLEDGE ABOUT AUTOBIOGRAPHICAL LITERATURE
DSC 20	EUROPEAN CLASSICAL LITERATURE	TO IMPART KNOWLEDGE ABOUT EUROPEAN CLASSICAL LITERATURE
DSC 21	RESEARCH METHODOLOGY & ESSAY WRITING	TO IMPART KNOWLEDGE ABOUT RESEARCH METHODOLOGY & ESSAY WRITING
DSC 22	POST-COLONIAL LITERATURES	TO IMPART KNOWLEDGE ABOUT POST-COLONIAL LITERATURES
DSC 23	RHETORIC, PROSODY AND LITERARY TYPES	TO IMPART KNOWLEDGE ABOUT LITERARY TECHNIQUES AND TYPES

DSC 24A	PARTITION LITERATURE	TO IMPART KNOWLEDGE ABOUT PARTITION LITERATURE
DSC 24B	DALIT LITERATURE	TO IMPART PRIMARY KNOWLEDGE ABOUT DALIT LITERATURE
DSC 25A	TEXT & PERFORMANCES	TO IMPART PRIMARY KNOWLEDGE THEATRE AND PERFORMANCES

DEPARTMENT OF HISTORY

Programme Specific Outcomes

1. Provides students with standard and up to date knowledge of historical events and its impact of our past with the present.
2. Makes a student aware of international situation.
3. Sensitizes them to the existence and desirability of the multipleperspective through which knowledge about past is constructed.
4. Encourages students to think critically
5. Make them able to analyze different perspective
6. Helps to articulate their own views regarding various themes in history
7. Develops a sense of active citizenship
8. Inculcates a humanitarian spirit within them
9. Encourages a student to pursue higher studies in history
10. Enables one to live a rich ,productive and meaningful life
11. Equips a student with certain skills like critical thinking, research and writing effectively.
12. Opens up a lot of prospects in terms of job like teaching, banking, management, police service, journalism,travel & tourism, law, content-writer etc.

COURSE OUTCOME OF HISTORY MAJOR, MINOR, MDC AND IDC UNDER CCF- 2022 OF NEP

SUBJECT	COURSE CODE	HISTORY OF INDIA FROM THE EARLIEST TIME TO C 300 BCE
HIS – H	CC1	This course intends to provide an extensive and deeper understanding of early Indian history to students. They will be introduced to the manner in which diverse aspects of ancient Indian history have been recovered from a rich variety of source, archaeological, literary, numismatic, epigraphist. Students will become familiar With the tools for studying history' and explore the diverse histories and regional variations in the Indian subcontinent and also study various facets of ancient India- social, cultural, political, environmental concerns. This course, with an interdisciplinary approach, will help students' trace elements of continuity and changes in processes spanning over several millennia, from pre-historic times up to the 300 BCE. The
HIS m1	Cc 1	
HIS-MD	CC 1	

		emphasis on historiography will allow students to understand how historians have approached ancient India and how our present knowledge and perceptions have played a role in interpreting the past.
HIS - H	CC2	SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA
HIS-m1 HIS-MD	CC 2 CC 2	This course aims to introduce the students to the significant developments in world history that have shaped the complexity of human existence. To begin with it offers a historical survey of human evolution. It details the transition from hunting gathering subsistence pattern to more advanced adaptations to a sedentary farming economy. The course content is premised on the understanding that the pace and nature of change differed in different parts of the ancient world.
HIS – H	CC3	HISTORY OF INDIA C 300 BCE TO CE 750 CE
HIS-m1 HIS-MD	CC3 CC 3	This paper focusses on the formation of polity, society, economy and religion of ancient India tracing the growth of empires from the Mauryas, to the Kushanas, the Satavahanas the Guptas, and also the post- Gupta polities such as the Pallavas, Chalukyas, and Vardhanas.
HIS – H	CC4	SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD OTHER THAN INDIA
HIS-m1	CC 4	<p>This course seeks to understand the transition of Ancient Europe into the medieval world. It therefore looks at the crisis caused by the decline of Roman Empire, the rise of religious organizations such as the Church and Monastery, the Carolingian and 12th century renaissance, and the rise of Universities and Towns. It addresses the ushering of Feudalism and its breakdown and finally deals with the crisis of Judaism and Christianity facing the advent of Islam and the counter attack, Crusades.</p> <p>This course explains the transition of Europe from Feudalism to Capitalism, illustrating the various forces that saw the culmination of this process. It thus includes geographical discoveries, Renaissance, Reformation, economic developments and the emergence of the national monarchies.</p>

HIS - H	CC5	HISTORY OF INDIA (C 750 – 1206)
		This course seeks to provide an understanding of early Medieval India - its polity, economy, society, religion and culture.
HIS - H	CC6	HISTORY OF EUROPE (C 1453 – 1650)
HIS-MD	CC 4	This paper explains the transition of Europe from feudalism to capitalism, illustrating the various forces that saw the culmination of this process. Thus includes geographical discoveries, Renaissance, Reformation, economic developments and finally the emergence of the national monarchies.
HIS - H	CC7	HISTORY OF INDIA (C 1206 – 1526)
HIS-MD	CC 5	This paper focuses on The polity, society and economy, culture and religion of the Delhi Sultanate
HIS - H	CC8	HISTORY OF EUROPE (C 1650 – 1780)
		This course looks at some of the major path breaking changes that took place around the mid 17th and late 18th century Europe such as the Print revolution, revolution in war techniques, Scientific Revolution, the growth of Mercantilism and its impact on the European economics, leading to a prelude to the industrial revolution, the growth of Parliamentary monarchy With patterns of absolutism that ushered in dramatic changes in the history of Europe.
HIS - H	CC9	HISTORY OF INDIA (C 1526 – 1605)
HIS-MD	CC6	Students will be able to identify the major political developments the History of India during the period between the sixteenth and the early seventeenth century. Outline the changes and continuities in the field of an eclectic political and religious ideology in connection With the bhakti movement and sufi movement Delineate the development of trade and urban complexes during this period.
HIS - H	CC10	HISTORY OF INDIA (C 1605 – 1750)
		Students will be able to identify the major political developments in the History of India during the period between the seventeenth and mid-eighteenth century. Outline the changes and continuities in the field of culture, especially with regard to art, architecture and literature. Delineate the development of trade and urban complexes during this period.
HIS - H	CC11	HISTORY OF MODERN EUROPE (C 1780 – 1939)

HIS-MD	CC 7	This paper studies the watersheds in European history beginning with the 1780s to the French revolution and its aftermath, the restoration of old hierarchies, the emergence of Capitalist industrialization and social and economic transformation in the late 18th century to 1914. It also looks at the varieties of Nationalism and the remaking of States in the 19t and 20th centuries leading to imperialism, war and crisis between c.1880 and 1918 and finally provides a picture of Europe between Two World Wars.
HIS - H	CC12	HISTORY OF INDIA (C 1750 – 1857)
HIS-MD	CC 8	This course would engage with the process of transformation of India during the eighteenth century into a colonial power. It would highlight British imperialist expansion in India, together with the setting up of an apparatus of governance of the British Raj, and its impact on the indigenous society and culture. The changes introduced in the rural economy and society, together with trade and industry would also be studied. Finally, the reactions and revolts against the colonial impositions would be addressed as well in this course.
HIS-H	CC 13	HISTORY OF INDIA(C 1857 _ 1964)
		This course introduces the student to India's freedom struggle. Beginning with the cultural, social and religious reform movements that provided the ideological basis of the national movement, it moves on to the role of associations, the moderate and extremist politics, to the Gandhian movements - Rowlatt Satyagraha and JajianwalaBagh, Non Cooperation, Civil Disobedience, Quit India and INA revolt. It deliberates on the ideologies and practices, of RSS, Hindu Maha Sabha, and the Muslim League. It also covers negotiations for independence and partition, popular movements, partition riots and finally the emergence of a New State, making of the Constitution, integration of princely states, Land reforms and beginnings of planning, during the Nehru years.
HIS-H	CC 14	HISTORY OF WORLD POLITICS:1945-1994
		This course seeks to delineate some important aspects of the twentieth-century world highlighting the impact of a shift from Eurocentric to ideologically polarized Super Power centric politics. It thus focusses on world politics in the post war period that saw a new type of war as manifested in the Cold War. Students will also get to know how nationalism, a core issue of 20th century contemporary world history, triggered national liberation movements that saw the emergence of the Third World on the one hand as the end of the cold war on the other-

		culmination in the rise of a unipolar world system.
		REPOSITORIES OF HISTORY:MUSEUM AND ARCHIVES
HIS-SEC HIS-MD	SEC-1 SEC	This course introduces students to the institutions that house and maintain documentary, visual and material remains of the past. Museums and archives are among the most important such repositories and this course explains their Significance and how they work. Students will be encouraged to undertake collection, documentation and exhibition of such materials in their localities and colleges. Visit to National Archives and National Museum are an integral part of the course.
HIS-SEC	SEC 2	UNDERSTANDING CULTURAL HERITAGE AND TOURISM
		This course will enable students to explore the various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. It will also address the questions of legalities and institutional frameworks for heritage, and finally deal with the issue of heritage tourism.
HIS-SEC	SEC-3	UNDERSTANDING POPULAR CULTURE OF BENGAL
		This paper seeks to provide an opportunity to the students to explore the various facets of popular culture within their region in different genres such as the performing arts, audio-visual entertainments that would provide them with a better understanding of the cultural diversity of Bengal.
HISD	IDC	This course focusses on the major national movements that led on to India's independence 1947. It also discusses the impact of Partition on society and culture and finally the evolution of Parliamentary democracy and Indian foreign policy during its early days.

DEPARTMENT OF PHILOSOPHY

Programme Specific Outcomes

We follow the prescribed syllabus of University of Calcutta. Our department offers both advanced and generic Courses in under graduate level. Below is the detail picture of course name and outcome.

Program Specific Outcome

The graduate degree holder in philosophy Honours and general course have following avenues open:

PSO1. Logical reasoning being an essential part of philosophy discipline, students can join legal profession and excel.

PSO 2. Government Services

PSO3. Career in Media

PSO4. Career in the field of Medical Ethics

PSO5. Academic Consultant

Course Outcome

COURSE NAME	COURSE OUTCOME
(PHIA) CC-1: Outlines of Indian Philosophy-1	CO1.Students have a complete and comprehensive knowledge about Carvaka, Jainism,Buddhism, Nyaya and Vaisesika Philosophy.
CC-2: History of western Philosophy-1	CO2.Students are to aquire knowledge about ancient and medieval Philosophy of western era.
CC-3: Outlines of Indian Philosophy-2	CO3.Indian epistemology and metaphysics are to be taught in this segment to make students comprehensive knowledge about the reality of the World.
CC-4: Outlines of Western Philosophy-2	CO4.Students taught to learn about the modern western philosophy.
CC-5:Philosophy of Mind	CO5.Students acquire knowledge about human psychology with special reference to other homosapiens groups.
CC-6:Social and Political Philosophy	CO6.This section deals with the prevalent social issues, political ideologies which are most effective for students to understand the difference between ought and is.
CC-7: Philosophy of Religion	CO7.Students understand the different religious views and outlooks. It also equipped them with the inter- religious understanding which is of very much implications in today's scenario.

CC-8:Western Logic-i	CO8.Logic is one of the finest reasoning that helps student to acquire the power of mathematical understanding. Nevertheless, it also helps them to inculcate rationality to its extent.
CC-9:Western Logic-ii	CO9.It builds the capacity to understand truth functional systems, quantification theory and other symbolic logic related topics.
CC-10:Epistemology and Metaphysics(Western)	CO10.This part of analytic philosophy enables students with hard core philosophical problems and solutions.
CC-11: Nyaya logic and Epistemology -i	CO11.This section enables students to think and practice logically and critically.
CC-12: Ethics-(Indian)	CO12.Ethics is an integral part of the syllabus that helps to build morality and values of life.
CC-13: : Nyaya logic and Epistemology -ii	CO13.Study of logic and epistemology makes students to grasp the techniques of valid arguments and reality of outer World.
CC-14: Ethics(Western)	CO14.Study of western ethics enables student to know the age old ideas of West
DSE- A and DSE-B	CO15.These are special papers which students have to take within their syllabus. These courses are meant for extensive study about hard core philosophical books and isms and also contemporary philosophical ideologies.
SEC-A and SEC-B	CO16.Under this heading, students are expected to equipped themselves with philosophical skills like understanding of man and nature relationships, feminism, logical applications, human rights, recent trends in ethics, peace studies etc.

NB: the syllabus of PHIG (Philosophy General) to same extent is similar with the syllabus of PHIA.

DEPARTMENT OF POLITICAL SCIENCE

Programme Specific Outcomes

1. Students scoring CGPA equivalent to 75% after successful completion of all the first 6 semesters (3years) may opt for Honours with research Degree Course in the 7th& 8th Semester.
2. Students choosing a 4year Bachelors Degree (single major with research course) undertake research projects under the supervision of a faculty member.
3. It's the basic conceptual clarity about the discipline that helps to explore other social sciences and feasible areas of interdisciplinary research.
4. Students can pursue legal studies/law or journalism in future as the course provide knowledge on laws, rights etc.
5. Students can go into teaching, bureaucracy, banking sector, social work etc.
6. Knowledge imparted about Constitution of India—its values and fundamental duties can make better parliamentarians/ legislators/ administrators.
7. The amalgamation of theoretical knowledge and research methodology helps to enhance their skills for further research and exploration.
8. Last but not the least students pursuing degree course in political science major will become wary, sensitive and conscious denizens.

Syllabus and Course Outcome

The affiliating University ensures that new areas are incorporated within the imparted courses and the ongoing Semester wise Four Year B.A (Honours & Honours with Research) course has Skill Enhancement Course (SEC) related to Legal Literacy, Legislative Procedures Research Methodology etc as well as Discipline Specific Core Course/ Core Course (DSCC/CC) associated with Governance and Public Policy, Gender Studies, Global Politics, Human Rights etc. It has opened up novel avenues for employment in the field of law, journalism, governance etc. and also encourages students to explore research areas through getting enrolled and pursuing degree course with research for probe further.

List of Discipline Specific Core Course/ Core Course (DSCC/CC) in Political Science Honours with its Outcome

Semester I (Core Course)	Course Outcome
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CC1 - Political Theory: Foundational Concepts	<ul style="list-style-type: none"> ❖ Enrich the students with theoretical understanding about concepts, theories of J.Rawls and David Held. ❖ Enhance the basic conceptual knowledge related Power, Authority, Liberty, Equality, Citizenship, Political Obligation etc.
SEC 1 - Democratic Awareness with Legal Literacy	<ul style="list-style-type: none"> ❖ It deals with legal system, IPC, CPC, FIR, laws to cease violence against women, cybercrimes, consumer rights etc.
Semester II (Core Course)	Course Outcome
CC2 - Constitutional Government in India	<ul style="list-style-type: none"> ❖ Impart knowledge about Indian Constitution, its evolution, salient features, amendment procedure and functioning of three organs of government.
SEC 2- Understanding the Legal System	<ul style="list-style-type: none"> ❖ Basically deals with Judicial Activism, PIL, Administrative Tribunal, LokAdalats, Anti Defection Law, Mahila Court etc.
Semester III (Core Course)	Course Outcome
CC 3- Political Theory : Approaches and Debates	<ul style="list-style-type: none"> ❖ Provide knowledge about various approaches in political science, theories, scientific socialism of Karl Marx, Lenin-Rosa debate, Hegemony and Civil Society of Gramsci
CC 4 - Politics in India: Structures	<ul style="list-style-type: none"> ❖ Generate awareness among students and keep them informed about Indian Party System and its functions.
SEC 3- Legislative Practices and Procedures	<ul style="list-style-type: none"> ❖ It deals with MPLAD, Privileges and Procedures of Parliament, local self government and legislative assemblies.
Semester IV (Core Course)	Course Outcome
CC5 - Politics in India: Processes	<ul style="list-style-type: none"> ❖ Sensitize students about various movements related to environment, human rights, women and impact of caste, religion and language on Indian Politics.
CC6 - International Relations: Concepts, Theories	<ul style="list-style-type: none"> ❖ Provide conceptual knowledge about International Relation, theories, contemporary issues and concepts.
CC7 - Public Administration— Concepts, Theories	<ul style="list-style-type: none"> ❖ It deals with basic understanding about public administration, theories and its major concepts.
CC 8 - Indian Political Thought-	<ul style="list-style-type: none"> ❖ Provide knowledge on contribution made by

I	various Indian Political Thinkers from Kautilya to Gandhi.
Semester V (Core Course)	Course Outcome
CC 9 - Indian Political Thought-II	❖ Provides knowledge on thinkers from M.N. Roy to Pandita Ramabai
CC 10- Western Political Thought-I	❖ It deals with the indelible contribution of western political thinkers from Greek till social contractalist like Hobbes, Locke and Rousseau.
CC 11- Political Sociology	❖ It basically deals with various concepts of social structure and impact of religion, gender on Indian politics and Electoral politics.
CC 12- India and the World: Foreign Policies and Strategies	❖ It focuses on basic features of Indian Foreign Policy and relation with China, Russia, USA as well as India emerging as a South Asian Power.
Semester VI (Core Course)	Course Outcome
CC 13 - Western Political Thought -II	❖ It deals with indelible contribution of western political thinkers from Bentham till Frankfurt School and Post Marxism contentions.
CC 14 - Public Administration: Indian Context	❖ It focuses mainly on civil service, Panchayati Raj, social welfare policies like MGNREGA, NHM, SSA, 73 rd and 74 th Amendment Act.
CC 15- Comparative Government and Politics- I	❖ Comparative study about salient features of the Constitution of UK, USA, PRC, Bangladesh, France and Switzerland. Also will provide basic understanding about comparative politics and comparative government and the differences between two.
Semester VII (Core Course)	Course Outcome
CC 16- Global Politics since 1945	❖ It deals with Cold War and Post Cold War Phase Politics, information about various regional organizations, UNO and bilateral relations with neighbouring countries.
CC 17- Comparative Government and Politics- II	❖ Basically will deal with functioning of various organs of government of different countries with different kinds of political systems.
CC 18 - Governance and public	❖ Its a new paper with relevant contemporary issues related to good governance and public

policy in India	policy.
Non-Dissertation students only	
CC 19- Understanding Gandhi and Ambedkar	❖ It will provide basic understanding of Gandhism and philosophy of Dr. B.R. Ambedkar, the Father of our constitution.
Semester VIII (Core Course)	Course Outcome
CC 20- Research Methodology and Academic Writings: Basics	❖ It deals with tools and techniques of research , methods of data collection, ethics in research, bibliography etc.
CC 21- Human Rights : Theory and Indian Context	❖ It provides knowledge on UDHR, NHRC, SHRC, history of human rights and problems related to it.
CC 22- Gender and Politics	❖ It gives an understanding about sex-gender debate, patriarchy, women's movement, violence against women etc.
CC 23- State Politics in India	❖ It is a new paper basically focussing on State Politics in different states of India
Non-Dissertation students only	
CC 24- Understanding South Asia	❖ It deals with South Asian Countries, bilateral relations among them.
CC 25- Understanding Political Economy	❖ It deals with Civil Society, Political Economy, Culture, Global Inequalities etc.

Apart from the above CC in Major there are CC papers for MDC students as well as SEC, IDC and CVAC papers too for specialisation.

Program Specific Outcome B.A Political Science Minor (MPLS)

1. Students who obtain Bachelor's degree if interested in further studies then take admission in Master's Degree through distance education or by qualifying written entrance exam.
2. The UG degree course helps them in gaining knowledge to prepare for competitive examinations and government jobs.
3. The students also gain knowledge, basic understanding about law through legal literacy course.
4. The knowledge gained helps to explore fields of social work and job prospects in NGOs.
5. The knowledge gained through Constitutional Values as CVAC helps in preparing for competitive examinations, comprehend the fundamental law of land.
6. Last but not the least students become better human beings and responsible citizens.

List of General Core Course (CC)/Generic Elective (GE) with its Outcome

<u>Semester I</u> (Core Course)	<u>Course Outcome</u>
CC 1- Political Theory: Foundational Concepts	<ul style="list-style-type: none"> ❖ Basically provides conceptual knowledge about the subject, denotation of terms like Democracy, Law, Liberty, Equality, Justice, Rights.
SEC 1 - Democratic Awareness with Legal Literacy	<ul style="list-style-type: none"> ❖ It deals with legal system, IPC, CPC, FIR, laws to cease violence against women, cybercrimes, POTA, TADA, UDHR, RTI, Human Rights Act 1993, consumer rights etc.
IDC 1 – Understanding Governance	<ul style="list-style-type: none"> ❖ It provides conceptual knowledge about Governance, Good Governance, Green Governance and E Governance. ❖ It deals with relationship between State, Civil Society and Market. ❖ It provides knowledge about Right to Information, People’s Participation and Public Service Delivery System.
<u>Semester II</u> (Core Course)	<u>Course Outcome</u>
CC 2- Constitutional Government in India	<ul style="list-style-type: none"> ❖ Basically emphasises on constitutional structure with salient features of India.
<u>Semester III</u> (Core Course)	<u>Course Outcome</u>
CC 3 - India and the World: Foreign Policies & Strategies	<ul style="list-style-type: none"> ❖ Basically deals with current affairs and Foreign Relations with Neighbouring Countries and Developed Nations, strategies and foreign policies.
<u>Semester IV</u> (Core Course)	<u>Course Outcome</u>

CC 4 - Public Administration: Indian Context	❖ It deals with Private Administration and New Public Administration, Development Administration, Comparative Public Administration, Public Policy, major programmes like MGNREGA, SSA, National Rural Health Mission etc.
CC 5 - Politics in India: Structures	❖ Generate awareness among students and keep them informed about structural framework, Indian Party System and its functions.
<u>Semester V</u> (Core Course)	Course Outcome
CC 6 - Politics in India: Processes	❖ Sensitize students about various movements related to environment, human rights, women and impact of caste, religion and language on Indian Politics.
CC 7 - Indian Political Thought I	❖ Provide knowledge on contribution made by various Indian Political Thinkers from Kautilya to Gandhi.
<u>Semester VI</u> (Core Course)	<u>Course Outcome</u>
CC 8 - Indian Political Thought II	❖ Provides knowledge on thinkers from M.N. Roy to Pandita Ramabai.

DEPARTMENT OF SANSKRIT
Programme Specific Outcomes

PO1: After completing three-year (Minor) multi-disciplinary course of studies students will be graduates which will enrich their field of knowledge.

PO2: Various multi-disciplinary research works in the field of Indology have been providing a lot of opportunities. Several universities around the world in the field of Indology has been providing well amount of fellowship for comparative studies. So, students can easily apply for that to get higher benefits.

PO3: IDC studies will help them to provide inter-related knowledge which will explore their various fields of interest.

PO4: Knowledge and language are always interrelated with each other. A huge amount of ancient Indigenous texts was written in Sanskrit language. Naturally studying Sanskrit will open up various dimensions of Indian knowledge system so that students can easily relate ancient educational system with modern one.

Programme Specific Outcome (PSO)

PSO1: Three-year multi-disciplinary (Minor) course of studies will provide to the students to achieve knowledge especially in Research oriented work which will very good in research-oriented activities.

PSO2: Course like IDC provided them interest in various multi-disciplinary studies which will provide them interest in higher researchable work

PSO3: Streams like IDC will give them to input about various kind of inter related knowledge which will help them to explore their thoughts in different academic fields

PSO4: various inter disciplinary studies with research wok will help them to nourish main streaming subject and not only that they have feel more interest to achieve better knowledge which will contributed in higher studies.

Course Outcome (CO) under CCF

Semester	Course Title	Course Outcome(CO)
I	<p>General Grammar and Meter</p> <p>Unit I=Basic concept of General Grammar</p> <p>Unit-II =METER</p> <p><i>Chandamanjari</i> of Gangadasa</p>	<p>CO1</p> <ul style="list-style-type: none">• Student have gained knowledge about some basic components of Sanskrit Grammar like conjugation, declension, case-ending, euphonic-combination, prefer, suffix etc.• These will help them to construct sentences in Sanskrit language• It will increase their field of interest in Sanskrit Grammar• Chandas or Meter will help them to understand the beatification of Sanskrit language
II	<p>History of Sanskrit Literature</p> <p>Unit-I=History of Vedic Literature</p> <p>Unit-II= History of Classical Sanskrit Literature</p> <p>Unit III=History of Scientific and technical Sanskrit literature</p> <p>Unit IV= Contribution of Scholars in the field of Sanskrit Literature</p>	<p>CO2</p> <ul style="list-style-type: none">• Students will gain knowledge about ancient history of Vedic literature and its modern implementation• History of Scientific literature will help them to provide knowledge about some scientific thoughts in ancient Indian society• Contribution of Scholars in the field of Sanskrit literature will help them to sustain the necessity of Sanskrit language in our modern society• It will help them to understand the evolution of Indian knowledge system

Course Outcome (CO) under CCF OF IDC

Semester	Course Title	Course Outcome (CO)
II	A. Mathematics and Astronomy B. Architecture	CO2 <ul style="list-style-type: none">• They have known about the ancient knowledge system of Mathematics and astronomy and its modern implementation• It will increase their field of interest in various interrelated ancient works which will also help in higher studies• Ancient Indian architecture or VastuVidya will help them to understand how our ancient science was developed and how we will implement in modern scenario

DEPARTMENT OF FILM STUDIES

Programme Specific Outcomes

Film Studies is a vibrant and modern subject. The syllabus ranges variedly to include Mainstream to Parallel, Classic to Avant -Garde of World, India & Bengali cinema. Besides the theoretical learning the students get a chance to make short films, fictional or non-fictional, as per the choice of semester. Along with the class lectures regular screening of the films are held, in separate classes or simultaneously as it is necessary.

The department has a designated room which is equipped with Projector, Screen and audio system.

The department also has a video camera, a DSLR camera and an edit set up which students use regularly for their practical projects. Students are constantly taught, guided & helped by the faculty members in their theory & practical classes.

With an exposure to history of cinema, language of cinema & about great filmmakers and their creations students get to see a glimpse of the huge horizon of the youngest but most popular art form. They are taught to see cinema in a different light here.

After graduating from the college they can go for Post-graduation in Film Studies, Diploma in different Film Schools or they may join film & television industry as assistants in different departments depending on their aptitude.

Course Outcome of Film Studies (General) Under CCF

CourseCode	CourseName	CourseOutcome
CCI/GE I(Semester I) Total Marks: 100 [Theory (Th) 75 +Practical (Pr)25] Total Credits: [4(Th)+2(Pr)]=6	Early Cinema and Script writing	<ul style="list-style-type: none">• Knowledge about early cinema and introduction to film technology.• Brief knowledge of early cinema.• Knowledge about script writing.• Practical knowledge about technicalities of filmmaking and script writing.
CCII/GEII(SemesterII) Total Marks: 100 [Theory (Th) 75 +Tutorial (Pr)25] Total Credits: [4(Th)+2(Pr)]=6	Film Theory and History: World Cinema	<ul style="list-style-type: none">• Idea about film Theory from formalist to realist film Theory.• Idea about how film contents and forms are influenced by socio-economic and geo-political changes.• Knowledge about Italian neorealism and French new wave.

DEPARTMENT OF COMMERCE

Programme Specific Outcomes

Programme Objective (PO) and Course Objective (CO) and Course Specific Objective (CSO)

B.Com (4-year Programme) and B.Com (MDC- 3-year Programme) under NEP- 2020

Programme Objectives (PO)

The B.Com. program at the University of Calcutta offers a comprehensive undergraduate curriculum, featuring both Four-Year Honours (with or without Research) and Three-Year Multidisciplinary options under the Credit and Curriculum Framework of the New Education Policy. The Four-Year Honours track is designed for advanced students pursuing higher studies or research in commerce, while the Three-Year Multidisciplinary option caters to those seeking immediate employment rather than further education.

This program encompasses a wide range of subjects, including accounting, finance, economics, business policy and ethics, corporate governance, business laws, and taxation. As a result, B.Com. graduates have excellent job prospects across various industries and the potential to become entrepreneurs.

Key opportunities for B.Com. students include:

PO-01- Students gain foundational knowledge in diverse areas such as accounting, finance, auditing, taxation, economics, management, business communication, entrepreneurship, business ethics, mathematics and statistics applications in commerce, marketing, human resources, e-commerce, and information technology. This background allows them to pursue higher studies (postgraduate and research), statutory professions like chartered accountancy or company secretaryship, or entrepreneurship.

PO-02- Many students opt for professional courses such as chartered accountancy (CA), company secretaryship (CS), or cost and management accountancy (CMA), which are in high demand in both corporate and non-corporate sectors. These qualifications also offer opportunities for independent practice.

PO-03- Graduates can pursue internationally recognized professional courses like CMA from the UK, ACCA and CA from the UK, CPA and CFA from the USA.

PO-04-A significant number of graduates choose to enroll in MBA programs to acquire essential skills for managerial roles with competitive salaries in the corporate sector.

PO-05- A career in Law, particularly Company Law, presents promising opportunities for commerce graduates.

PO-06- Only commerce graduates are eligible for specialized government positions as gazetted officers in central or state Audit and Accounts Services.

PO-07- A solid understanding of financial and cost accounting principles, financial management, tax systems (both direct and indirect), auditing procedures, statistical applications, and marketing concepts equips graduates with practical skills for roles such as tax consultants, auditors, management consultants, financial experts, stock market analysts, and other support services.

Course Objective (CO) and Course Specific Objective (CSO)

Semester I

1. Financial Accounting I (Major Paper 1)

Course Objective (CO)

The Financial Accounting 1 course aims to provide a foundational understanding of key accounting principles and practices. By the end of the course, students will gain a preliminary understanding of financial accounting concepts and introduction to few Accounting Standards and will be able to apply this knowledge to the preparation and analysis of financial statements of a sole proprietorship concern, non-profit organisation and from incomplete records. The course will equip the students with the necessary skills to handle various real-world accounting tasks and challenges.

Course Specific Objectives (CSO)

- a. CSO_1- The students will understand and apply the accounting equation to record business transactions, gain a clear understanding of the accounting cycle, differentiate between cash basis and accrual basis of accounting and their implications for financial reporting and learn and apply core accounting concepts and conventions
- b. CSO_2- The students will study the principles of revenue recognition and expense matching, ensuring proper financial period identification in line with relevant Accounting Standards, understand different methods of inventory valuation in line with the Accounting Standard, inventory reconciliation and their impact on financial statements and profit measurement, gain a solid understanding of depreciation accounting and the rationale behind

choosing a specific method in compliance with standards. The students will learn to differentiate between the reserves and provisions, understand the accounting treatment for creating, using, and writing back provisions and reserves, study how to make rectification entries to correct errors in the books of accounts and understand the importance of adjustment or closing entries at the end of an accounting period.

c. CSO_3- The students will develop skills to prepare financial statements for a sole proprietorship, reflecting the owner's equity and personal transactions.

d. CSO_4- The students will learn the Income and Expenditure Account and Receipts and Payments Account formats used for non-profit organizations like clubs, trusts, and societies. The students will learn methods for converting incomplete records (single-entry system) into double-entry formats for preparing accurate financial statements, gain proficiency in estimating missing financial data using techniques like the Statement of Affairs method and the Conversion Method and develop analytical skills to reconstruct financial data and derive meaningful financial statements from limited records.

e. CSO_5- The students will understand the self-balancing system and how it facilitates the independent balancing of subsidiary ledgers (sales, purchases) from the general ledger, study the sectional balancing system, which allows for the preparation of individual trial balances for specific sections of a business, aiding in error detection and accountability and gain insight into the practical application of these systems in managing complex accounting records, especially in large organizations.

2. Principles and Practice of Management (Minor Paper 1)

Course Objective (CO)

The course is designed to offer students a solid foundation in essential management principles and practices. Through a focus on key areas such as planning, organizing, directing, leadership, motivation, coordination, and control, students will gain a thorough understanding of how these functions contribute to effective organizational performance. The course emphasizes practical applications, enabling students to develop critical decision-making, resource management, and leadership skills. By the conclusion of the course, participants will be equipped to manage teams, streamline operations, and drive organizational success across various business contexts while promoting sustainable growth and development.

Course Specific Objectives (CSO)

- a. CSO_1- Students will have an overall idea about various concepts of management and the historical development and concept of different schools of management.
- b. CSO_2- Students will have a detailed idea on the various concepts of planning.
- c. CSO_3- Students will have a detailed idea on the various concepts of organizing.
- d. CSO_4- Students will have a detailed idea on the various concepts of directing and leadership including discussion on the major theories of leadership.
- e. CSO_5- Students will have a detailed idea on the various concepts of motivation, control and co-ordination.

3. Microeconomics (IDC/MDC- Paper 1)

Course Objective (CO)

The course "Microeconomics" aims to provide students with a detailed understanding of fundamental economic principles at the individual and firm levels. It covers key topics such as the theory and elasticity of demand and supply, consumer behaviour, production theory, and cost and revenue structures. Students will explore how markets operate, how consumers and firms make decisions, and the impact of price changes. By the end of the course, students will be able to analyse economic behaviours, interpret market trends, and apply microeconomic concepts to real-world business and policy decision-making scenarios.

Course Specific Objectives (CSO)

- a. CSO_1- Demand is an important element to analyse consumer behaviours. On the other hand, supply is an important element to analyse producer behaviour. For this the different aspect of demand and supply are discussed in this chapter.
- b. CSO_2- Elasticity of demand is an important element to measure the rate of change of demand with respect to price, similarly elasticity of supply is an important element to measure the rate of change in supply with respect to price. For this the different aspect of elasticity of demand and elasticity of supply are discussed in this chapter.
- c. CSO_3- Utility is an important concept in the theory of consumer behaviour. There are two types of utility, one is Marshallian and other is Hicksian. In this chapter different aspects of these two theories are discussed.
- d. CSO_4- The amount of supply depends on production and the decision of production is made by the production unit or firm, which depends on cost. For this in this chapter different aspects of production and cost are discussed.

e. CSO_5- Market is the centre of life in modern economic system. Market is operated through the interaction of buyer and seller. But the behaviour of buyer and seller are different in different markets. For this detailed analysis of the market structure is very essential. Another concept relating to market is the revenue. For this different aspect of revenue are also discussed in this chapter.

4. Entrepreneurship Development (SEC Paper 1)

Course Objective (CO)

The Entrepreneurship Development course is designed to equip students with a comprehensive understanding of entrepreneurship and its key components. By the end of the course, students will have gained a well-rounded understanding of entrepreneurship, including the skills needed to create, evaluate, and manage a business venture. They will also learn about the critical role of investors, the importance of strategic planning, and how to leverage resources and support systems to succeed in the entrepreneurial ecosystem.

Course Specific Objectives (CSO)

- a. CSO_1- The course will introduce the students to various types of entrepreneurs, including innovators, imitators, and fabian entrepreneurs, explore the distinctions between social, serial, and corporate entrepreneurship, and their roles in driving economic growth and innovation. The course will provide insights into the values, vision, and philosophies of leading Indian entrepreneurs, analyse case studies of prominent Indian entrepreneurs to understand their approaches to leadership, decision-making, and value creation and foster an appreciation of how Indian cultural and social values influence entrepreneurial practices.
- b. CSO_2- The students will examine the various governmental policies, public sector initiatives, and private sector support systems that promote entrepreneurship. They will understand the role of institutions like incubators, accelerators, and government programs (such as Startup India) in stimulating entrepreneurial activities and explore strategies for ensuring the sustainability of entrepreneurial ventures, with a focus on environmental, social, and economic sustainability. The course will introduce the students to the critical roles of VCs, Private equity funds and angel investors in funding and scaling entrepreneurial ventures.
- c. CSO_3- The students will develop the ability to prepare detailed and persuasive business proposals that include key components such as business model, market analysis, financial projections, and risk assessment. They will learn how to conduct and write a feasibility report to assess the viability of a business idea, including financial, technical, and market feasibility

and understand the significance of a well-structured business plan in securing funding and support from stakeholders.

d. CSO_4- The students will explore various financing options available to entrepreneurs, such as bootstrapping, crowdfunding, bank loans, and government grants, understand the importance of networking, partnerships, and leveraging community resources in building a successful business.

Common Value-Added Course

5. Fundamentals of Environment (ENVS01)

Course Objective (CO)

The course is designed to introduce students to key environmental concepts and issues. It covers topics such as the basics of environmental studies, ecology and ecosystems, natural resource management, biodiversity, and conservation strategies. The course also addresses various forms of environmental pollution and their impact on ecosystems and human life. By the end of the course, students will develop a comprehensive understanding of environmental challenges and learn to apply conservation and sustainable practices to protect natural resources and promote ecological balance.

Course Specific Objectives (CSO)

CSO_1- Introduce students to key concepts in environmental studies, focusing on human-environment interactions.

CSO_2- Explain the principles of ecology and ecosystem dynamics, highlighting the interdependence of living organisms and their environments.

CSO_3- Explore the classification, management, and sustainable use of natural resources.

CSO_4- Discuss biodiversity and conservation strategies for protecting endangered species and ecosystems.

CSO_5- Analyse various forms of environmental pollution, their sources, and their effects on the environment and human health.

CSO_6- Equip students with the knowledge and skills to promote sustainable practices and address environmental challenges effectively.

6. Constitutional Values and Fundamental Duties

Course Objective (CO)

The course is designed to enrich students with knowledge and relevance of Indian Constitution, to develop awareness about values of basic tenets and Duties and to inculcate a sense of Constitutionalism.

Course Specific Objectives (CSO)

CSO_1- Provide an in-depth understanding of the Constitution of India and its significance.

CSO_2- Explain the concept of Constitutionalism and its role in democratic governance.

CSO_3- Explore key Constitutional values such as sovereignty, socialism, secularism, democracy, and republic.

CSO_4- Examine Fundamental Rights and their relationship with the Rule of Law and Separation of Powers.

CSO_5- Discuss the importance of Fundamental Duties outlined in the Constitution, with emphasis on Article 51A.

CSO_6- Analyse the legal status and implications of Fundamental Duties in the Indian constitutional framework.

CSO_7- Foster appreciation for responsible citizenship and civic duties.

Semester II

1. Cost Accounting 1 (Major Paper 2)

Course Objective (CO)

The course aims to introduce students to the fundamental concepts of cost accounting and its application in decision-making processes. It covers key areas such as material cost, labour cost, and overhead allocation, providing insights into the effective management of production costs. Students will learn how to prepare and interpret cost statements to analyse financial data for internal business control. By the end of the course, students will have a comprehensive understanding of cost accounting techniques and their importance in improving operational efficiency and profitability in various business contexts.

Course Specific Objectives

CSO1: Students will get the knowledge of how cost accounting is used for ascertaining the cost of elements of a product.

CSO2: Students will understand the format of cost sheet and to learn applicability of cost sheet to ascertain pricing of any product.

CSO3: Students will acquire knowledge about the concept of labour costing and material costing.

CSO4: Students will understand the concept of overheads and its impact on selling price of a product.

CSO5: Students will acquire in depth knowledge of cost accounting.

2. Marketing Management and Human Resource Management (Minor Paper 2)

Course Objective (Module 1- Marketing Management) (CO)

The course aims to provide students with a comprehensive understanding of fundamental marketing principles and strategies. It covers an introduction to marketing, the marketing environment, and market segmentation to help students identify and target specific consumer groups. Key topics include product development, pricing strategies, distribution channels, and promotional techniques. Additionally, the course explores recent developments in marketing, such as digital marketing and consumer behaviour trends. By the end of the course, students will be equipped with the skills to analyse markets, develop marketing plans, and implement effective marketing strategies in a dynamic business environment.

Course Specific Objectives (CSO)

CSO_1- Introduce the core concepts of marketing and the marketing environment.

CSO_2- Explore the process of market segmentation to identify and target specific consumer segments effectively.

CSO_3- Examine product development strategies and their importance in meeting customer needs.

CSO_4- Discuss pricing strategies and their impact on consumer behaviour and market competition.

CSO_5- Analyse distribution channels and their role in ensuring product availability to the target market.

CSO_6- Understand the various promotional tools and techniques used to communicate with customers.

CSO_7- Investigate recent developments in marketing, including digital marketing and emerging consumer trends.

Course Objective (Module 2- Human Resource Management) (CO)

The course aims to provide students with a thorough understanding of the nature and scope of HRM and its role in organizational success. Key topics include human resource planning, recruitment, and selection processes, which are essential for building an effective workforce. The course also covers training and development strategies to enhance employee skills, as well as job evaluation and performance appraisal techniques to assess and reward employee performance. By the end of the course, students will be equipped with the knowledge to manage human resources effectively in a dynamic and competitive business environment.

Course Specific Objectives (CSO)

CSO_1- Students will learn the fundamental concepts of human resource - meaning, scope, functions and importance.

CSO_2- Students will learn about the meaning of human resource planning (HRP), the need, characteristics and the different factors affecting it.

CSO_3- Students will have a detailed idea on the various concepts related to recruitment and selection.

CSO_4- Students will have a detailed idea on the various concepts of training and development.

CSO_5- Students will have a detailed idea on the various concepts of job evaluation and performance appraisal.

3. Macroeconomics (IDC/MDC Paper 2)

Course Objective (CO)

The course on Macroeconomics aims to provide an understanding of the aggregate economy, focusing on the measurement of National Income and its components. It explores the Determination of Equilibrium Income in the Simple Keynesian Model, highlighting the roles of consumption, investment, and government spending. The course covers Money and Banking, examining the functions of money, the banking system, and monetary policy. Additionally, it introduces Public Finance, addressing government revenues, expenditures, and fiscal policies, emphasizing their impact on economic stability and growth. Students will develop analytical skills to understand macroeconomic issues and policy decisions.

Course Specific Objectives (CSO)

CSO_1- A basic concept of macroeconomics is National Income. Welfare of a country mainly depends on National Income. For this, different aspects of National Income accounting are discussed in this chapter.

CSO_2- In this chapter simple Keynesian model is used for the equilibrium income determination. Different aspects of multiplier are also discussed in this chapter.

CSO_3- Role of money is very important in modern economic life. Considering the importance of money in modern period, different aspects of banking, different subject matters of inflation and deflation are discussed in this chapter.

CSO_4- Public finance is the study of the role of the government in the economy. The main consideration of public finance is government budget, government receipts, government expenditure and government deficit.

4. IT and its Application in Business (SEC Paper 2)

Course Objective (CO)

The course on IT and its application in business aims to provide students with an understanding of how information technology enhances business operations. It covers topics such as the role of IT in decision-making, improving efficiency, and facilitating communication. Students will learn about various business applications of IT, including data management, e-commerce, and enterprise systems, while exploring how technology drives innovation and competitive advantage in the modern business environment.

Course Specific Objectives (CSO) (Module 1- Theory)

CSO_1- Understand the fundamental concepts of information technology (IT) and its role in business.

CSO_2- Familiarity with various business applications of IT, such as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM).

CSO_3- Knowledge of database management systems and data analytics.

CSO_4- Understanding of e-commerce, digital marketing, and social media platforms.

CSO_5- Familiarity with emerging technologies like cloud computing, artificial intelligence (AI), and the Internet of Things (IoT).

Course Specific Objectives (CSO) (Module 2- Practical)

CSO_1- Skill in using software applications (e.g., Microsoft Office) for business purposes.

CSO_2- Proficiency in data analysis and interpretation using tools like Excel.

CSO_3- Ability to design and implement basic database systems using tools like Access.

CSO_4-Familiarity with web development concepts (HTML, CSS). Assess the ethical implications of IT use in business.

Common Value-Added Course

5. Environmental Education (ENVS02)

Course Objective (CO)

The course on Environmental Education aims to raise awareness of environmental issues and promote sustainable practices. It covers topics such as ecosystems, biodiversity, natural resource management, and pollution control. Students will explore the impact of human activities on the environment and learn strategies for conservation and sustainable development. The course encourages critical thinking and responsible actions to address global environmental challenges, fostering a commitment to environmental stewardship.

Course Specific Objectives (CSO)

CSO_1-Develop a foundational understanding of the principles and goals of Environmental Education, promoting awareness and active participation in environmental protection.

CSO_2- Learn about environmental laws, policies, and regulatory frameworks that govern the protection and preservation of natural resources.

CSO_3- Analyse the interdependence between human communities and the environment, focusing on sustainable practices and societal impacts.

CSO_4-Understand various environmental disasters and the importance of preparedness and mitigation strategies.

CSO_5- Study the self-sustaining systems of nature and explore how human actions can either support or harm these natural processes.

6. Lifestyle Diseases and Their Prevention

Course Objective (CO)

The course on Lifestyle Diseases and Their Prevention aims to provide students with a comprehensive understanding of the relationship between lifestyle choices and the development of chronic diseases. The course helps the students to understand the implications of stress, obesity and how to mitigate them with the help of mindfulness, yoga, pranayama and other techniques.

Course Specific Objectives (CSO)

CSO_1- Define lifestyle diseases and identify their characteristics, including common examples such as heart disease, diabetes, and obesity.

CSO_2-Analyze the modifiable risk factors associated with lifestyle diseases, such as poor diet, physical inactivity, smoking, and excessive alcohol consumption.

CSO_3- Examine the health consequences of lifestyle diseases, including their impact on morbidity, mortality, and quality of life.

CSO_4- Evaluate effective prevention strategies that can reduce the risk of developing lifestyle diseases, including dietary modifications, regular physical activity, and smoking cessation programs.

CSO_5- Encourage critical thinking about current research on lifestyle diseases and their prevention.

Semester III

1. Cost Accounting II (Major Paper 3)

Course Objective (CO)

The course on Cost Accounting aims to provide an understanding of cost measurement and management. It covers Cost Bookkeeping, focusing on recording and tracking costs, and Activity-Based Costing for accurate cost allocation. The course includes Job Costing, Contract Costing, and Process Costing to handle specific costing scenarios. It also explores accounting for Joint Products and By-products, equipping students with skills to optimize cost efficiency and decision-making in business operations.

Course Specific Objectives (CSO)

CSO_1- Students will build the ability to understand job, batch and operational costing.

CSO_2- Students will understand the concept of budgeting and tools of budgetary control.

CSO_3- Students will understand the concept of process costing including joint product and by-product costing.

CSO_4- Students will acquire knowledge about the concept of operating or service costing.

CSO_5- Students will learn the concept of absorption costing, marginal costing, cost volume and profit analysis.

CSO_6- Students will acquire knowledge about decision making on “make or buy’ on the basis of cost analysis.

2. Direct Tax I (Major Paper 4)

Course Objective (CO)

The course on Direct Taxation aims to provide a comprehensive understanding of tax laws and their application. It covers basic concepts such as tax definitions, taxable entities, and tax rates. Students will learn about the residential status and its impact on tax incidence, and explore different heads of income, including salary, house property, business income, capital gains, and other sources, enabling them to apply tax principles to real-world financial scenarios.

Course Specific Objectives (CSO)

CSO_1- Students will get an opportunity to know about the Indian Tax structure.

CSO_2- They will be able to know the residential status of the respective assesses.

CSO_3- Income from five different heads, such as, salary, house property, profits & gains, capital gain and other sources have been thoroughly discussed here.

CSO_4- Hands on experience can be availed by solving numerical.

CSO_4- Students can have enough knowledge to calculate total taxable income of any financial year.

3. Consumer Behaviour (Minor Paper 3- Elective)

Course Objective (CO)

The students will gain a comprehensive understanding of consumer psychology and its application in developing successful marketing programs. The course will equip them with the knowledge and skills to make data-driven decisions that meet consumer needs while adhering to ethical standards.

Course Specific Objectives (CSO)

CSO_1- Understand and apply consumer behaviour models (Nicosia model and Howard Sheth model) to analyse consumer decision making and develop effective marketing strategies.

CSO_2- Examine the ethical considerations in marketing practices and their impact on consumer trust and brand reputation.

CSO_3- Identify and evaluate the internal and external determinants that influence consumer behaviour, including psychological, social, cultural and situational factors.

CSO_4- Analyse the stages of the consumer decision making process and how marketers can influence each stage to drive purchase behaviour.

CSO_5- Assess the role of consumer behaviour in shaping societal trends, public policy and the overall business environment.

CSO_6- Apply consumer behaviour concepts to design and interpret market research studies that provide actionable insights for marketing managers.

4. Indian Economic Environment (IDC/MDC Paper 3)

Course Objective (CO)

The course on Indian Economic Environment provides an in-depth understanding of the Indian economy's structure and dynamics. It covers the key aspects of the Indian Economic Environment, including its historical evolution and contemporary challenges. Students will analyse the Structure of the Indian Economy, focusing on sectors like agriculture, industry, and services. The course also examines Issues in the Indian Economy and evaluates Indian Economic Planning strategies for sustainable growth and development.

Course Specific Objectives (CSO)

CSO_1- After studying this chapter, students will be able to understand the basic issues in economic development. Gain an insight into the concepts of growth and development. Know the concepts and measures of development and underdevelopment.

CSO_2- After studying this chapter, students will be able to understand the issues related to the agricultural sector such as low productivity, green revolution, and land reforms. Gain an insight on the industrial growth during the various reforms' periods. Define the role of service sector- growth of banking and insurance during the post-reform period.

CSO_3- After studying this chapter, students will be able to understand the problem of poverty and the various methods used to measure poverty and the poverty alleviation measures adopted in India. Define the various types of unemployment and causes of unemployment in India.

CSO_4- After studying this chapter, students will be able to understand the meaning, objectives, importance of planning in India. Achievement and failures of five-year plan. Concepts and objectives of NITI Aayog.

5. Computerised Accounting and Introduction to Data Science (Practical) (SEC paper 3)

Computerised Accounting and Digitalisation (Module 1)

Course Objective (CO)

This course aims to provide students with both practical and theoretical knowledge in computerized accounting using Tally Prime. Students will acquire the skills necessary to handle

day-to-day accounting functions, ensure compliance with payroll and GST regulations, and manage data security. In addition, the course introduces essential digital services like e-PAN, Digi Locker, and online banking, equipping students to navigate the modern, digitalized financial landscape efficiently.

Course Specific Objectives (CSO)

CSO_1- The students will learn to create and manage company profiles in Tally Prime, including alteration and shutting down a company as needed. They will gain a thorough understanding of accounting groups and ledgers, enabling students to create, edit, and manage financial accounts for different business scenarios. They will understand the creation and processing of accounting vouchers in Tally Prime, including sales, purchase, payment, receipt, and journal vouchers. The course will enable the students to master the setup and management of payroll in Tally Prime, including creating employee records, defining salary structures, and generating payroll vouchers and understand the process of GST accounting, including configuring Tally Prime for GST. They will learn how to create data backups, manage security controls such as user roles and password protection, and restore data in Tally Prime to ensure data safety and integrity.

CSO_2- The students will develop an understanding of e-PAN (electronic PAN card) and the process for obtaining and using it for financial and tax-related purposes and learn about Digi Locker, gain hands-on experience with online banking and payment systems, explore M-Parivahaan and Aadhar-based services, such as e-KYC and Aadhaar authentication, to understand their significance in the digital economy.

Introduction to Data Science (Module 2)

Course Objective (CO)

The course on Introduction to Data Science provides a foundational understanding of data management and analysis. It covers Database Applications, enabling students to handle large datasets efficiently. The course explores Advanced Data Management with Spreadsheets, teaching techniques for data organization, analysis, and automation. Students will also learn about Tables and Formatting, focusing on structuring and presenting data effectively, equipping them with essential skills for data-driven decision-making in business environments.

Course Specific Objectives (CSO)

CSO_1- Develop proficiency in database applications to manage, manipulate, and retrieve data effectively using various database management systems.

CSO_2-Enhance skills in advanced data management through the use of spreadsheets, focusing on data organization, analysis, and visualization techniques.

CSO_3- Understand tables and formatting principles** to present data clearly and effectively, ensuring that information is accessible and interpretable for decision-making.

CSO_4- Apply data science concept to real-world scenarios, enabling students to analyse and interpret data for practical applications in various fields.

CSO_5- Foster critical thinking regarding data integrity, ethical considerations, and best practices in data management and analysis.

Semester IV

1. Financial Accounting II (Major Paper 5)

Course Objective (CO)

The course on Financial Accounting provides an understanding of specialized accounting practices. It covers Consignment and Branch Accounting, focusing on managing transactions across locations. Students will learn the Hire Purchase and Instalment Payment System for asset acquisition, and Departmental Accounts for internal financial reporting. The course also addresses Insurance Claims for loss recovery and Partnership Accounting, equipping students with skills to handle diverse accounting scenarios and ensure accurate financial reporting.

Course Specific Objectives (CSO)

CSO_1- Students will be able to understand the concept of consignment business and also will gather knowledge regarding accounting aspect for computing profit or loss on consignment.

CSO_2- Students will be able to prepare branch accounts and to understand the expansion led to the concept of development of branch.

CSO_3- Students will be conversant with both hire purchase and Instalment payment system.

CSO_4- Students will be able to understand the departmental Trading and Profit & Loss Account and Balance Sheet in present competitive business environment.

CSO_5- Students will have an overall impression about insurance and they will be able to understand how insurance claim to be lodged.

CSO_6- Students will be well versed with the different laws governing partnership in relation to their accounting needs.

2. Direct Tax-II and e-filing of Tax Return (Major Paper 6)

Course Objective (CO)

The course on Direct Tax and E-filing of Tax Returns aims to provide a comprehensive understanding of tax laws and digital tax filing. It covers Set-off and Carry Forward of Losses, enabling students to understand how to offset losses against future profits. The course explores

Deductions and Computation of Total Income and Tax Payable, guiding students through the calculation of taxable income. Additionally, it focuses on Tax Management strategies to optimize tax liabilities. Students will also gain practical knowledge in E-filing of Tax Returns, learning to navigate digital platforms for accurate and compliant submission of tax documents.

Course Specific Objectives (CSO)

CSO_1- Explain the principles and regulations governing the set off and carry forward of losses in direct taxation, enabling students to apply these concepts in tax planning.

CSO_2- Develop skills to accurately compute total income by identifying applicable deductions under various sections of the Income Tax Act.

CSO_3- Master the methodologies for calculating tax payable based on total income, including understanding tax slabs and applicable rates.

CSO_4- Explore effective tax management techniques to optimize tax liabilities while ensuring compliance with legal requirements.

CSO_5- Gain practical knowledge in the e-filing process of tax returns, including documentation requirements, filing procedures, and troubleshooting common issues.

CSO_6- Discuss ethical considerations in tax planning and compliance, fostering a responsible approach to direct taxation practices.

3. E-commerce and Business Communication (Major Paper 7)

Course Objective (CO)

The course will Analyse the impact of E-commerce on business models and strategy, identify key security threats in the E-commerce environment and explain how procurement and supply chains relate to B2B E-commerce. The students will learn to develop proficiency in written and oral communication skills for effective business interactions, including emails, reports, presentations, and negotiations. They will understand the role of communication, apply ethical principles. By achieving these objectives, students will gain the necessary knowledge and skills to thrive in the dynamic E-commerce landscape while effectively communicating with various stakeholders to drive business success.

Course Specific Objectives (CSO)

E-Commerce (Module-1)

CSO_1- Students will gather knowledge about the emergence of digital electronic commerce and its governing characteristics

CSO_2- Students will understand the ways in which e-commerce is conducted in virtual space

CSO_3- Students will become proficient in conducting and facilitating economic transactions using e-payment system

CSO_4-Students will understand the features of websites and the tools used to build an e-commerce website

Business Communication (Module 2)

CSO_1-Students will gather knowledge about business communication, its importance, network and models

CSO_2- Students will understand the concepts, elements and barriers to communication

CSO_3-Students will learn the types and tools of communication

CSO_4- Students will master the skills of drafting letters, notices, agenda, minutes etc.

4. Business Regulatory Framework (Major Paper 8)

Course Objective (CO)

The course objective is to provide students with a comprehensive understanding of the legal and regulatory environment affecting businesses. Students will explore key regulations, including corporate governance, consumer protection. The course aims to equip learners with the ability to analyse and interpret legal frameworks, assess compliance requirements, and understand the implications of regulatory changes on business operations, thereby fostering informed decision-making in a dynamic marketplace.

Course Specific Objectives (CSO)

CSO_1- Students will be aware of the laws and regulations that governs business operations. The knowledge of business laws helps to students in identify potential business risk and develop strategies to manage them effectively.

CSO_2- Students will acquire functional knowledge and concept about contract and able to understand The Indian Contract Act, 1872

CSO_3- Students will learn the basic concept of laws regarding The Sale of Goods Act, 1930

CSO_4- Students will be well versed with different laws governing partnership in India.

CSO_5- Students will be aware of the concept and objectives Consumer Protection Act,2019 and also will learn composition of consumer protection council and various jurisdiction regarding this Acts.

5. Sales Management (Minor Paper 4- Elective)

Course Objective

The objective of the course is to provide students with a comprehensive understanding of sales organization and the principles of designing and managing an effective sales force. Students will explore the fundamentals of personal selling and salesmanship, emphasizing relationship-building techniques. Additionally, the course will cover the evaluation and selection of marketing channels to optimize sales efforts. By integrating these elements, students will develop strategic insights to enhance sales performance and drive business success.

Course Specific Objectives (CSO)

CSO_1-Students will gather knowledge about the sales organization.

CSO_2- They will be able to know about designing the sales force.

CSO_3-They will get a complete picture on how to manage sales force.

CSO_4-The knowledge about personal selling and salesmanship technique will be provided them.

CSO_5-Different marketing channels and selection procedure will be discussed here.

DEPARTMENT OF CHEMISTRY

Programme Specific Outcomes

- **PO1:** Ready the graduate students for their career in government job, in industry and to motivate them for higher education and to take up research as a career.

- **PO2:** The student will be capable of applying modern technologies, handling advanced instruments and Chemistry related soft-wares to identify formulate and analyze complex scientific problems for chemical analysis and characterization of materials.

- **PO3:** The various branches of Chemistry can be helpful to graduate students to develop critical thinking and to design, carry out, record and analyze the results of chemical reactions also expose the diversified aspects of chemistry where the students experience a broader outlook of the subject that.

- **PO4:** The course curriculum has been designed to provide opportunity to act as team player by contributing in laboratory, field based situation, industry and also think methodically, independently and draw a logical conclusion.

- **PO5:** Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

- **PO6:** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

- **PO7:** A Chemistry graduate student learn how to follow the green routes for the synthesis of chemical compounds and also find out new greener routes for sustainable development. The course also helps them to understand the causes of environmental pollution and thereby applying environmental friendly policies instead of environmentally hazard ones in every aspect.

- **PO8:** Chemistry graduate students can handle many decent instruments and advanced technologies to synthesize, characterize and analyze the chemical compounds very skillfully. Such a wonderful practice in the graduate level will bring a good opportunity to the students for getting job in industries besides academic and administrative works.

➤ **PO9:** AI syllabus is aimed to explore the role of AI in enhancing chemistry education, ensuring that our undergraduate students are well prepared for the dynamic landscape of scientific research and innovation.

➤ **PO10:** SEC-3 syllabus provide introduction of numerical methods useful for chemist.

PROGRAMME SPECIFIC OUTCOME (PSO):

PSO-1: The students pursuing graduation in chemistry are expected to gain knowledge of the fundamental concepts of chemistry and applied chemistry through theory and practical. The students would have to develop in depth understanding of various aspects chemistry.

PSO-2: Graduates in Chemistry are expected to demonstrate, understanding and achieve critical thinking ability of the fundamental principles, including scientific reasoning to solve problems, of organic chemistry, inorganic chemistry, analytical chemistry and physical chemistry.

PSO-3: Students are expected to possess sufficient knowledge how to synthesize a chemical compound and perform necessary characterization and develop analytical abilities for independent thinking.

PSO-4: Chemistry students are expected to be well trained which will help student's to build-up a progressive and successful career in Chemistry.

PSO-5: Graduates are expected to be team players, with productive co-operations involving members from diverse socio-cultural backgrounds.

PSO-6: Students will demonstrate research skills in chemistry, including proper laboratory notebook and record keeping skills, recognizing hazards, minimizing risks, and safe laboratory practices.

Course Outcomes

Semester	Course Code	Course Outcomes
	DSCC-1	CO – 1 <ul style="list-style-type: none">• To know extra nuclear structure of atom• General idea about modern periodic table and periodicity• To understand the basic concepts of organic chemistry based on chemical bonding and physical properties• To learn the basic concepts of Stereochemistry of Organic

SEM - 1		<p>molecules</p> <ul style="list-style-type: none"> • General idea about thermodynamics of a system and thermochemistry • To understand the basic concept of chemical kinetics of a reaction • To study the estimation of ions or salts by acid-base titration method and oxidation-reduction titration method by hand-on practical
	SEC-1	<p style="text-align: center;">CO – 2</p> <ul style="list-style-type: none"> • To know about quantitative analysis and basic laboratory practices • To understand the basic concept errors, standard calibration, presentation of experimental data and results • To know about different type of titrimetric analysis, water analysis and water treatment technologies • To know about safety practices in chemistry laboratory and knowledge about toxic chemicals and safety measures in their handling • To learn about the calibration of various glassware and instruments • Knowledge about the preparation of TLC plates and separation of amino acids
SEM - 2	DSCC-2	<p style="text-align: center;">CO – 3</p> <ul style="list-style-type: none"> • To understand the basic concept of kinetic theory of gases and know how to solve numerical problems related to that topic • To study about chemical bonding and its applications • To learn theoretical principles of inorganic qualitative analysis • To learn absolute configuration of chiral compounds; concept of optical activity and racemization • To understand reaction kinetics, reaction thermodynamics of organic reactions. • To know about reactive intermediates and free radical substitution reaction • To study experimentally the qualitative detection of known and unknown radicals in a mixture.
	SEC-2	<p style="text-align: center;">CO – 4</p> <ul style="list-style-type: none"> • To understand the valuable insight into the current state of AI technology and its application in healthcare, finance, transportation etc. • To learn the challenges and opportunities of incorporating AI effective strategies and ethical considerations.

SEM - 3	DSCC-3 (PHYSICAL CHEMISTRY)	<p style="text-align: center;">CO – 5</p> <ul style="list-style-type: none"> • To learn in detail about the second laws of Chemical Thermodynamics and the related terms; to get idea about thermodynamic relationships and system of variable compositions. • To gain vast knowledge on chemical equilibrium and electrochemistry. • To learn experimentally how to study the kinetics of the inversion of cane sugar using a polarimeter • To study experimentally how to determine rate constant of different reactions
	DSCC-4 (ORGANIC CHEMISTRY)	<p style="text-align: center;">CO – 6</p> <ul style="list-style-type: none"> • To understand about different types of electrophilic and nucleophilic aromatic substitution reactions, reaction intermediates and their mechanisms. • To study about general treatment of reaction mechanism, tautomerism and concept of acids and bases • To understand about conformational nomenclature of some organic compounds and their relative stability • To know reaction mechanisms of nucleophilic substitution reactions and elimination reactions. • To learn in detail about the synthesis, properties, and reaction mechanisms of alkenes and alkynes • To study experimentally the qualitative detection solid and liquid organic compounds.
	SEC-3	<p style="text-align: center;">CO – 7</p> <ul style="list-style-type: none"> • Gain the knowledge about finding roots, linear regression, Lagrange interpolation, numerical differentiation and integration, Fourier transformations which are used to determine different calculations of Physical Chemistry
	DSCC-5 (INORGANIC CHEMISTRY)	<p style="text-align: center;">CO – 8</p> <ul style="list-style-type: none"> • To study about molecular orbital concept of bonding, metallic bond and weak chemical forces • To understand the concept of inorganic acid-base • To learn about radioactivity and nuclear reactions • To learn experimentally the complexometric estimation of different ions, chromatographic separation of (i)Ni (II) and Cu (II) ions, (ii)Fe (III) and Al (III) ions, (iii) Cu (II) and Zn (II) ions, (iv) Ca (II) and Mg (II) • To study experimentally the hardness of water

SEM - 4	DSCC-6 (ORGANIC CHEMISTRY)	<p style="text-align: center;">CO – 9</p> <ul style="list-style-type: none"> • To learn stereochemistry of chiral compounds arises due to presence of chiral-axis; concept of prostereoisomerism and study of conformational analysis of some acyclic organic molecules. • To study the properties and reactions of carbonyl compounds and corresponding reaction mechanisms. • To learn preparations, reactions and corresponding reaction mechanisms of organometallic compounds. • Helps to know experimentally the qualitative analysis of single solid organic compounds.
	DSCC-7 (PHYSICAL CHEMISTRY)	<p style="text-align: center;">CO – 10</p> <ul style="list-style-type: none"> • To learn about the transport processes of liquids and gases. • Helps to know the Bravais Lattice and Laws of Crystallography, Crystal Planes and Specific Heat of Solid • Helps to understand about the applications of Thermodynamics in Colligative Properties and Phase Equilibrium • To know about electromotive force • To know experimentally how to study surface tension using Stalagmometer, viscosity using Ostwald's viscometer and conductometric experiments
	DSCC-8 (INORGANIC CHEMISTRY)	<p style="text-align: center;">CO – 11</p> <ul style="list-style-type: none"> • To know the meaning of various terms involved in co-ordination chemistry, Werner's theory for complex formation, structural and stereoisomerism of co-ordination complexes. • Helps to understand about the structures, stability, color, magnetism and Orgel diagram of the co-ordination compounds on the basis of modern concepts of chemical bonding. • To learn about valence bond theory and crystal field theory • To gain knowledge about supramolecular chemistry, molecular assemblies and intermolecular interactions • Toknowthebasicconceptsofredoxreactions and redox titrations

DEPARTMENT OF COMPUTER SCIENCE

Programme Specific Outcomes

Programme Outcomes:

PO1. Develop ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.

PO 2. To prepare students to undertake careers involving problem solving using computer science and technologies.

PO 3. Develop ability to pursue advanced studies and research in computer science.

PO 4. To produce entrepreneurs who can innovate and develop software product.

PO 5 - Apply the knowledge of mathematics, science, Computer fundamentals, and specialization to the solution of complex problems.

PO 6 - Problem analysis: Identify, formulate, review research literature, and analyze complex problems reaching substantiated conclusions using first principles of mathematics, natural sciences.

PO 7 - Design/development of solutions: Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 8 - Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 9 - Modern tool usage: Create, select, and apply appropriate techniques, resources, and IT tools including prediction and modeling to complex activities with an understanding of the limitations.

PO 10 - Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.

PO 11 - Environment and sustainability: Understand the impact of the professional solutions in

societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 12 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities.

PO 13 - Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 14 - Communication: Communicate effectively on complex activities with the community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 15 - Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes

Core Course	Topic	Course Outcomes (CO)
DSC/CC-1		CO-1
For SEM 1	Computer Fundamentals and Digital Logic Design	<ul style="list-style-type: none"> • Understanding of Computer fundamentals , generation, classification of computers and brief understanding of computer language. • Realize basic gate operations and laws Boolean algebra • Understand basic structure of digital computer, stored program concept • and different arithmetic and control unit operations. • Introduce the concept of digital and binary systems • Be able to design and analyze combinational logic circuits. • Be able to design and analyze sequential logic circuits. • Understand the basic software tools for the design and implementation of digital circuits and systems. • To formulate simple algorithms for arithmetic and logical problems.

SEC-1		Course Outcomes (CO-2)
For SEM 1	Data visualization using spreadsheet	<ul style="list-style-type: none"> • explore the functionalities of Excel that are used for problem solving in a business context • demonstrate the numeracy skills required for gathering and organising data for decision making related to a specific problem • use graphical techniques (histograms and scatter diagrams) to provide a visual summary of available data • recognise data presentation and communication techniques used in a range of traditional and electronic media • describe the relationship between two variables (independent and dependent variables)
DSC/CC- 2		Course Outcomes (CO-3)
For SEM II	Problem Solving using C	<ul style="list-style-type: none"> • To translate the algorithms to programs (in C language). • To test and execute the programs and correct syntax and logical errors. • To implement conditional branching, iteration and recursion. • To decompose a problem into functions and synthesize a complete program using divide and conquer approach. • To use arrays, pointers and structures to formulate algorithms and programs. • To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. • To apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration
SEC-2		Course Outcomes (CO-4)

For SEM II	Web Development	<ul style="list-style-type: none"> To introduce the fundamentals of Internet, and the principles of web design. To construct basic websites using HTML and Cascading Style Sheets. Technical Skills: I significantly improved my coding abilities, gaining hands-on experience with various programming languages and frameworks. Working on live projects helped me understand the nuances of web development in a practical context. Professional Development: The internship developed my ability to work in a team, communicate effectively with colleagues, and manage time efficiently. I learned the importance of attention to detail and the value of constructive feedback. Industry Knowledge: I gained insights into the web development industry, including current trends, challenges, and the importance of user-centered design.
DSC/CC- 3		Course Outcomes (CO-5)
For SEM III	Computer Architecture & Organization	<ul style="list-style-type: none"> Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations. Understand basic structure of different combinational circuits multiplexer, decoder, encoder etc. Perform different operations with sequential circuits. Understand memory and I/O operations Learn pipelining concepts with a prior knowledge of stored program methods Learn about memory hierarchy and mapping techniques. Study of parallel architecture and interconnection network
DSC/CC- 4		Course Outcomes(CO-6)
For SEM III	Data Structure	<ul style="list-style-type: none"> Differentiate how the choices of data structure & algorithm methods impact the performance of program. Solve problems based upon different data structure & also write

		<p>programs.</p> <ul style="list-style-type: none"> • Identify appropriate data structure & algorithmic methods in solving problem. • Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing • Compare and contrast the benefits of dynamic and static data structures implementations.
SEC-3		Course Outcomes(CO-7)
For SEM III	Mobile App Development	<ul style="list-style-type: none"> • Identify various concepts of mobile programming that make it unique from programming for other platforms. • Critique mobile applications on their design pros and cons, • Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces, • Program mobile applications for the Android operating system that use basic and advanced phone features, and • Deploy applications to the Android marketplace for distribution.
DSC/CC-5		Course Outcomes(CO-8)
For SEM IV	Computational Mathematics	<ul style="list-style-type: none"> • Express a logic sentence in terms of predicates, quantifiers, and logical connectives. • Derive the solution for a given problem using deductive logic and prove the solution based on logical inference • Classify its algebraic structure for a given a mathematical problem, • Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra • Develop the given problem as graph networks and solve with techniques of graph theory • Understand numerical techniques to find the roots of nonlinear equations and solution of system of linear equations. • Understand the difference operators and the use of Interpolation.

		<ul style="list-style-type: none"> • Understand numerical Differentiation and Integration and numerical solutions of ordinary and partial differential equations.
DSC/CC-6		Course Outcomes (CO-9)
For SEM IV	Micro processor and its Applications	<ul style="list-style-type: none"> • Understand the taxonomy of microprocessors and knowledge of contemporary microprocessors. • Describe the architecture, bus structure and memory organization of 8085 as well as higher order microprocessors. • Explore techniques for interfacing I/O devices to the microprocessor 8085 including several specific standard I/O devices such as 8251 and 8255. • Demonstrate programming using the various addressing modes and instruction set of 8085 microprocessor • Design structured, well commented , understandable assembly language programs to provide solutions to real world control problem.
DSC/CC-7		Course Outcomes(CO-10)
For SEM IV	Operating System	<ul style="list-style-type: none"> • Create processes and threads. • Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. • For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system. • For a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers

DSC/CC-8		Course Outcomes (CO-11)
For SEM IV	Object Oriented Programming	<ul style="list-style-type: none"> • Students will understand the need of object oriented programming, fundamental concepts and will be able to solve computational problems using basic constructs like if-else, control structures, array, strings in Java environment. • Student will understand how to model the real world scenario using class diagram and be able to exhibit communication between objects using sequence diagram. • Students will be able to implement relationships between classes. • Students will be able to demonstrate various collection classes. • Students will be able to create and user interfaces and packages. • The students will be able to demonstrate programs on exceptions, multithreading and applets. • Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects. • Understand dynamic memory management techniques using pointers, constructors, destructors, etc • Describe the concept of function overloading, operator overloading, virtual functions and polymorphism

DEPARTMENT OF GEOGRAPHY

Programme Specific Outcomes

Name of the Programme: B.Sc. Single Major in Geography – GEOM (under NEP-CCF)

Name of the Programme: B.Sc. in MDC with Geography – MGEO (under NEP-CCF)

PROGRAMME OUTCOMES (PO)

Implementation of NEP 2020 has brought in a new trend in Indian education system. This new education policy emphasizes more on holistic development of a student rather than his/her academic progress only. Emphasis has also been given on employability of a student, so that he or she can become a self-sufficient and self-reliant citizen. Keeping in mind the above objectives, the curriculum has been designed.

PO1. The four years' (eight semesters) Honours course in Geography helps the students to have scientific knowledge on different aspects of geography with development of logical and reasoning faculties.

PO2. The programme helps the students to apply the acquired knowledge on different branches of geography in the practical field and makes them acquainted with different scientific methodologies, instrumentation and application of modern technologies to solve various pressing problems of the community, the region and the world in relation to geography.

PO3. After successful completion of the programme, especially the four years' course with research, a student can pursue higher studies with geography or allied subjects and can opt for research work as well.

PO4. The knowledge and skills acquired by the students during their under graduate geography course, make them competent enough for multiple careers.

PO5. The programme helps the students to be well equipped for the job market and makes them employable as well as self-reliant and conscious citizen.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1. After completion of the four years' single major course in Geography, the students will develop strong insight into the fields of Physical Geography like Geotectonics, Geomorphology, Climatology, Soil and Bio-geography, Hydrology, Oceanography etc.

PSO2.The programme also focuses on the components of Human, Economic, Social and Cultural Geography and enables the students to correlate these components in a meaningful manner.

PSO3.The programme helps to enhance the quantitative aptitude of the students through exercises on quantitative techniques and statistical methods.

PSO4. Studying Cartographic Techniques, which is an important component of the curriculum of the programme, the students can acquire thorough knowledge in the field of surveying, map making, map projection and map reading. They also get opportunity to become conversant with different types of maps and with the essential components of a map.

PSO5.The ICT based modules on Remote Sensing and Geographical Information System (RS –GIS) help them to be acquainted with the modern techniques of geographical data acquisition, data analysis, data interpretation, and data representation and enhances their computer usage skill.

PSO6.The Programme includes modules on Research Methodology, Field Work, Project report Preparation etc. and thereby provides the students with strong analytical skill, research aptitude, problem solving skill, critical thinking ability, observation power and management skill.

PSO7.In course of their study, the students have to conduct questionnaire survey in the field, present posters, prepare project reports and appear before the subject experts for viva voce. All these help them to develop their communication skill, presentation skill and writing skill.

PSO8.The curriculum includes modules on historical geography, political geography, philosophy of geography, etc. which enable the students not only to have a comprehensive understanding on evolution of geography as a modern and contemporary discipline, but help them also to integrate it with other allied disciplines as well as with the contemporary socio-political scenario.

PSO9.The courses on hazard management, environmental management, watershed and coastal management help the students to acquire the ability to apply their knowledge in real life situations.

In a nutshell, studying the four years' UG Honours course in Geography, the students will acquire the ability to synthesize geographical knowledge, apply it scientifically to solve various pressing problems of the community, the region and the world and communicate properly the solutions and findings both in oral and written format.

PSO10.After completion of this programme, the students will be able to pursue higher studies (Master degree or equivalent) in Geography or in allied subjects like Urban and Regional

Planning, Environmental Science, Archaeology, Marine Science, Meteorology, Remote Sensing and GIS etc. in different higher education institutions within India or in abroad.

PSO11.The NEP – CCF four years' single major curriculum offers the opportunity of pursuing research work in 8th semester (provided the student secures 75% marks in the previous semesters on an average). This research experience is definitely helpful in making a student's research career and he or she may opt for research career in different research institutes.

PSO12.They may also enrol themselves for different professional courses like MBA, MCA, B.Ed., RS-GIS certificate course etc.

PSO13.The knowledge and skills acquired by the students during their under graduate geography course, make them competent enough for multiple careers. The NEP – CCF curriculum includes internship as a mandatory course work before obtaining the degree/diploma or certificate and thereby ensures hands on experience of the students in different fields of geography. Moreover, the CCF curriculum offers the flexibility to switch over to professional career at the end of any even semesters. This will definitely broaden up their career opportunities.

After completion of the four years' Honours course in Geography, a student may pursue his/her career as a -

Teacher in academic institutions

Research personnel in the research institutes

Cartographer

Environmental consultant/scientist

Town/urban planner

GIS professional

Geospatial Analyst

Remote sensing professional

Conservator of forest

Consultant in the field of soil and agriculture

Land use specialist and planner etc.

Market Research professional

PSO14.Under graduate programme in Geography (Honours) offers opportunity to deal with some burning issues of the modern era and develop solutions to the same, like - global warming, climate change, hazard and disaster management, water conservation, coastal

management, environmental management, urban expansion, population explosion, environmental pollution and sustainability.

Thus, the programme not only provides the graduates with solid knowledge base, research aptitude and professional skill, but helps them to be conscious, responsible and self-reliant citizens also.

Course Outcome:					
Semester	Course Code	Course Name	Credit	Course Outcome	
Sem I	GEOM-DSCC 1 MGEO-DSCC 1	Physical Geography	3(Th)+1(Pr.)	CO1	<p>CO1.1- Basic conception on different components of physical Geography like Geotectonics, geomorphology, climatology, soil geography, biogeography, cartography and geography of hazards</p> <p>CO1.2 - Theoretical knowledge on significance of scale in geography and ability to construct linear, diagonal and vernier scale.</p> <p>CO1.3 - Ability to delineate a drainage basin, which is a fundamental geomorphic unit and to determine stream ordering and bifurcation ratio in a drainage basin.</p> <p>CO1.4 - Experience in identifying drainage and channel patterns from SOI topographical maps.</p> <p>CO1.5 - Ability to prepare wind rose diagram.</p>
	GEOM & MGEO SEC 1	Methods in Geography	4(Th)	COSEC1	<p>COSEC1.1 - Acquaintance with the basic methods in geography.</p> <p>COSEC1.2 - Preliminary idea about sampling, preparation of questionnaire, data collection and compilation, computer assisted data entry and statistical analysis of the data.</p> <p>COSEC1.3 - Familiarity with the use of minor survey instruments like Brunton compass, distometer, smartphone leveling applications.</p> <p>COSEC1.4 - Theoretical knowledge on grain size analysis by sieving.</p> <p>COSEC1.5 - Theoretical knowledge on mapping technique of flooded area using satellite imageries and DEM.</p> <p>COSEC1.6 - Knowledge on mapping technique of coastal erosion and river bank erosion.</p> <p>COSEC1.7 - Knowledge on the methods of preparation of accessibility map, dominant and distinctive functions, ternary diagram and flow chart.</p>
SEM II	GEOM-DSCC 2 MGEO-DSCC 2	Human Geography	3(Th)+1(Pr)	CO2	<p>CO2.1 - Understanding of the nature, scope, elements and recent trends in human geography.</p> <p>CO2.2 - Concept on evolution of human society and human adaptation to environment.</p> <p>CO2.3 - Concept on demographic characteristics like population density, distribution, growth etc. with special emphasis on India.</p> <p>CO2.3 - Knowledge about rural and urban settlements.</p> <p>CO2.4 - Familiarity with the method of calculation and graphical representation of arithmetic growth rate.</p> <p>CO2.5 - Practical knowledge on representation of population density by choropleth method, identification of settlement patterns and</p>

					representation of number of houses by proportional squares.
SEM III	GEOM-DSCC 3	Geotectonics	3(Th)+1(Pr)	CO3	<p>CO3.1 - Understanding of the tectonic and structural characteristics of the earth and the resulting processes and landforms with special reference to the recent developments in plate tectonic theory including understanding of morphometric indices of tectonic activity.</p> <p>CO3.2 - Hands on experience of handling clinometer and ability to measure dip and strike of rock beds in the field with the help of this instrument.</p> <p>CO 3.3 - Ability to identify different rocks and minerals in the field.</p> <p>CC3.4 - Ability to identify and analyze tectonic activities from SOI topographical maps.</p> <p>CC3.5 - Ability to interpret geological maps.</p>
	GEOM-DSCC 4 MGEO-DSCC 3	Economic Geography	3(Th)+1(Pr)	CO4	<p>CO 4.1 - Comprehensive knowledge about the fundamental concepts of economic geography.</p> <p>CO4.2 - Knowledge about economic activities (primary, secondary and tertiary) and the location theories of economic activities.</p> <p>CO4.3 - Ability to represent different types of economic data diagrammatically, using suitable techniques.</p>
SEMESTER IV	GEOM-DSCC 5 MGEO-DSCC 4	Geomorphology	3(Th)+1(Pr)	CO5	<p>CO5.1 - Idea about the different geomorphological agents, geomorphological processes and the resulting landforms.</p> <p>CO5.2 - Knowledge about the theories on landform evolution with special reference to the concepts of some pioneers like Davis, Penck, Hack and King.</p> <p>CO5.3 - Acquaintance with the basic features of SOI Topographical maps and ability to do some practical exercises on it and extract relevant information through application of morphometric techniques.</p>
	GEOM-DSCC 6 MGEO-DSCC 5	Climatology	3(Th)+1(Pr)	CO6	<p>CO6.1 - Comprehensive knowledge about the earth's atmosphere and the major atmospheric phenomena like atmospheric pressure and temperature, circulation, precipitation, cyclones and frontogenesis, thunderstorm etc.</p> <p>CO6.2 - Knowledge about some special phenomena like monsoon, jet stream, El Nino etc.</p> <p>CO6.3 - Acquaintance with the existing schemes of climatic classification.</p> <p>CC6.4 - Understanding of the recent burning issue of climate change.</p> <p>CO6.5 - Ability to measure different climatic elements like rainfall, humidity, atmospheric temperature, air pressure etc. using analog instruments.</p> <p>CO6.6 - Ability to interpret daily weather map and forecast the weather.</p> <p>CO6.7 - Knowledge on graphical and diagrammatic representation of different weather phenomena.</p>
	GEOM-DSCC 7	Social Geography	3(Th)+1(Pr)	CO7	<p>CO7.1 - Awareness and understanding of the contemporary social issues and gender related</p>

					<p>problems.</p> <p>CO7.2 - Knowledge on social problems of rural and urban areas.</p> <p>CO7.3 - Awareness on social welfare schemes.</p> <p>CO7.4 - Ability to represent social data cartographically.</p> <p>CC7.5 - Ability to determine GDI and HDI.</p> <p>CC7.6 - Ability to prepare questionnaire on socio-economic survey.</p>
	GEOM-DSCC 8	Cartographic Techniques	3(Th)+1(Pr)	CO8	<p>CO8.1 - Familiarity with different types of maps and the components of map.</p> <p>CO8.2 - Comprehensive knowledge on map making and associated issues like geographical coordinate system, linear and angular measurement, map projection and related concepts.</p> <p>CO8.3 - Ability to construct different types of projections and thematic maps.</p>

Geography as Inter Disciplinary Course (IDC):

Semester	Course Code	Course Name	Credit	Course Outcome	
To be studied in any of the first 3 semesters (1/2/3)	GEOD	Geomatics and spatial analysis	2(Th)+1(Pr)	CO1IDC	<p>COIDC1 - Perception of scale and other important components of map.</p> <p>COIDC2 - Familiarity with the concepts of bearing (true bearing and magnetic bearing, whole circle bearing and reduced bearing), geoid, spheroid etc.</p> <p>COIDC3 - Knowledge about classification and properties of projection with special emphasis on simple conical and UTM projection.</p> <p>COIDC4 - Acquaintance with the concept of surveying and different surveying instruments.</p> <p>COIDC5 - Familiarity with Global Navigation Satellite System (GNSS).</p> <p>COIDC6 - Knowledge on basic principles of Remote Sensing (RS), properties of standard FCC and image classification.</p> <p>COIDC7 - Knowledge on GIS data type and its application.</p> <p>COIDC8 - Hands on experience of traverse survey and plotting of UTM coordinates using smart phone GNSS application.</p> <p>COIDC9 - Expertise to identify land use- land cover features from FCC.</p> <p>COIDC10 - Experience on detection of changes of river bank and coast line shift from multi-dated maps and images.</p>

DEPARTMENT OF MATHEMATICS

Programme Specific Outcomes

In B.Sc. Under-graduate CCF, 2022 System (Four year (Eight-semester) Honours and Honours with Research course with Mathematics Major under curriculum and credit framework), and the following developments have been achieved by the students after completing the whole course:

1. ACADEMIC DEVELOPMENT

The course makes a good grounding in rudiments of higher mathematics for the students, both pure and applied Mathematics from classical to abstract level. This should prepare them for post graduate studies as well as doing research in various field of Mathematics and its allied areas such as Physics, Computer Science, and Data Science etc. More additionally, the Interdisciplinary course (IDC) in Mathematics helps the students to develop the preliminary knowledge about the application of Mathematics in their daily life.

2. REASONING & TECHNICAL SKILL DEVELOPMENT

In Skill enhancement course (SEC), the students learn “C”, a high level computer language, PYTHON, as technical skill developing software and LATEX mathematical software which will enable them to write mathematical paper, project. Students are also skilled with the study of Boolean algebra, Modelling theory and Discrete Mathematics, Numerical Analysis, Linear programming problems which are very demandable in various fields in academic and corporate sectors.

3. JOB ORIENTED COURSE

Statistics, Discrete Mathematics, Computer programming are all part of the syllabus. The students may pursue higher studies in Statistics or related fields like big data analytics, financial statistics etc. These also have high demand in the job market and students are able to succeed in the competitive examinations. In spite of these the training of the software like C programming, PYTHON software helps students to get job in corporate sectors. As this knowledge is in much demand in the job market, it should help them in their career.

Program Specific Outcomes

PSO-1: Gain of Academic Knowledge

The course helps the students to acquire extensive basic knowledge to advance level in several areas of Mathematics such as Classical algebra, Abstract algebra, Linear algebra, Real and Complex analysis, Geometry and Vectors, Calculus of single and multi variables, Statics, Dynamics, Hydrostatics, Probability and Statistics, Numerical Analysis, Operational Research, Computer programming in various softwares like C, PYTHON, LATEX, which makes them steady to make their future in both academic and corporate field.

PSO-2: Correlation with Indian Knowledge System

The Program is so nicely designed that the students have to study compulsory Value added courses like Environmental Studies, Constitutional values, Indian Knowledge system and its applications, Machine learning, Value oriented Life skill Education which familiarise students with Indian constitution, ancient Indian art, culture, architecture, astronomy, health etc.

PSO-3: Maintenance of Professional Ethics:

Discrete mathematics, Operational research etc. are used in many kinds of data security like *Coding theory, Cryptography* and *Mathematical logic* part of the course is usually used to control fallacy, contradiction and existence of data in various mathematical field of study. Statistics part of the course is mainly used for data collection and authentication of gender sensitization.

PSO-4: Development of Logical Sense

The syllabus is so designed that the students are to go through abstract mathematics. In this journey they have to logically prove several theorems, corollary etc. from hypothesis. So hypothetical and logical sense have been grown in the minds of the students so that they can prove any arbitrary theorem. Also mathematical logic is a part of the syllabus to develop the logical sense of the students.

PSO-5: Reasoning and Interactive Mind

Reasoning is very much required to understand and solve mathematical problems. Throughout the study of undergraduate programmes students develop reasoning by practising problem

solving by using mathematical logic which build up their concrete reasonable mind to clear their doubts in any field by interaction.

PSO-6: Logical and Technical Skill Development:

In the study of the course there are some to train the students about computer software such as C programming, PYTHON, LATEX which enhances the technical and computer skills of the students, which are very essential to solve mathematical problems easily.

PSO-7: Interdisciplinary Sense of learning:

Under CCF, 2022 pattern, besides of Mathematics Honours subjects, students have the option to take interdisciplinary subjects by their own choice such as, Philosophy, Sanskrit, History etc. This helps them to develop the basic knowledge of these subjects. Not only that the honours course is so designed that there are some parts like Boolean algebra, logic gates, discrete mathematics, statistics which are common to related subjects like Physics, Computer Science, Chemistry, Statistics and Engineering. So the students will acquire interdisciplinary knowledge which can make a pathway to their future study in any branch of science technology.

PSO-8: Hands-on Training Experience of Problem Solving

The practical part of the course aims that the students get hands-on training to solve various problems of numerical analysis and statistics using C language. After training, students are able to solve various problems by writing programmes.

PSO-9: Research Oriented Self-Directed Learning

In theoretical and practical parts of the course, the students have gained basic ideas of almost all field of advanced Mathematics like Algebra, Analysis, Geometry, Vectors, Discrete Mathematics, Numerical analysis, Operational Research, Advanced Mechanics etc. To study these, students have to prepare projects and practical note books by identifying the topics or problems, study about it and then formulate and solve it, which is self-directed and makes the students research oriented. In the 4th Year of study, the eligible students may take entry for doing research work.

PSO-10: Outcome of Employability:

This course is very much job oriented. After completing the whole course students may have a bright future of getting employment in various sectors. Students are eligible to appear in the entrance test of Government sectors like Railway service commission.

Course Outcome

Semester	Course Name	Topics	Course Outcome
1 st	DSCC1 (Calculus, Geometry & Vector Analysis)	Unit – I: Calculus Unit – II: Geometry Unit – III: Vector Analysis	<u>CO-1</u> The learners mainly gain the nature of curves in Cartesian or polar coordinates. Moreover, (a) There is a scope to obtain higher order derivatives and apply further wherever necessary. (b) The students learn reduction formula of integration and L Hospital’s rule of limit to find hard integration and limit. (c) They obtain the knowledge of curve tracing and to obtain different curve characteristic terms like length of curve, curvature, envelope curve etc. (d) Students acquire the knowledge of the behaviour of plane, line and surface in space. (e) Students obtain skill to classify conics in 2D and 3D Geometry. (f) Get idea of vector product, vector function, limit, continuity, differentiation and integration. (g) Obtain the ability to apply vector concept in different brunch of applied mathematics. (h) They are able to solve various problems related to vector equations, application to geometry and mechanics of vector analysis, which has useful applications in various branches of Mathematics and Physics.

1 st	SEC 1-1- (C Programmi ng)	<u>Unit I</u> (Overview of architecture of computer) <u>Unit II</u> (Operations and Expressions) <u>Unit III</u> (Decision Making and Branching)	<u>CO-2</u> Computer programming is now very much essential for the study of different areas of Science, Commerce as well as Social sciences. Software wholly depends on computer programming. On completion of this course, the students will acquire knowledge (a) on basic keywords, functions and data type used in C programming language (b) on condition, loop and structure that used to make computer program (c) on defining array, user defined function, pointer and creating a file through C. Thus students will learn a soft-skill in the area of computer science and can take entry to the software industry.
1 st & 2 nd & 3 rd	IDC (Mathemati cs in daily Life	<u>Group A</u> (Basics of Set Theory) <u>Group B</u> Understandin g Integers <u>Group C</u> Mathematical Logic <u>Group D</u> Basics of Operational Research <u>Group E</u> Financial Mathematics	<u>CO-3</u> The course mainly aims to teach fundamental rules and techniques of Mathematics for common pupils which will help them very much for facing mathematical problems in their everyday life. a) Set theory used to build the shortest technique of solving statistical problems by using Venn-Diagram. b) Concept of Integers is a pivotal knowledge in Mathematics which helps the students to ready for any competitive examinations, Quiz contest etc. c) Mathematical logic develops reasoning techniques of the students which is also required for competitive examination for getting jobs. d) Operational research is used for formulation of daily life problems as an LPP (e.g., Carpenter problem, preparation of mixtures of chemical, diet problems etc.)

			e) In financial Mathematics, students will learn about Simple and compound interest, Interest payable monthly, quarterly, annually, Dividend Calculation and Calculation of Income tax which are the burning problem in Daily Life.
2 nd	DSCC 2 (Basic Algebra)	Unit – I: Classical Algebra Unit – II: Abstract Algebra Unit – III: Linear Algebra	CO-4 On completion of this course, students gain the knowledge about <ol style="list-style-type: none"> 1. Complex number, polynomials, inequality which will be needed in studies of real and complex analysis in coming semesters. 2. Sets, relation, mapping and notions of integer, congruence relation are foundation of Modern Algebra as well as discrete mathematics, which is also in UG Course. Moreover they have important implications in practical field like to prepare Credit card, Debit Card, ISBN, ISSN etc. 3. Application to linear system of equations will help students in linear algebra course in semesters 4, 5 and 6. Matrix theory plays one of the most important role in various other subjects like computer science, operational research etc. which have nowadays direct implications in almost every aspect of life.
2 nd	SEC 2.1 (Python Programming and Introduction to Latex)	Group A (Python Programming) Group B (Introduction to Latex)	CO-5 Python is a database Programming which helps the students to acquire knowledge by hands-on training on the language, designing with simple functions , editing, solving and running a script, plotting single and multiple functions using SymPy etc. After studying these the students are eligible to make programs

2 nd			<ol style="list-style-type: none"> 1) about the conversion of numbers from decimal to any other systems like binary, octal and hexadecimal. 2) to read one subject mark and print pass or fail, to find median of a given set of numbers 3) to prepare investment reports by calculating compounding interest for a given sum of money 4) to check whether a given year is a leap year or not. <p>Latex software is very useful in Mathematics to write a project, research paper or Book chapter with enormous mathematical symbols, equations, figures, graphs etc.</p> <p>As an outcome students can have the eligibility</p> <ol style="list-style-type: none"> 1) to write down a research article 2) to prepare reports on practicals done in the laboratory with results, tables, and different types of figures. graph and charts <p>to present graphical analysis taking graphs plotted in gnuplot.</p>
2 nd	<p style="text-align: center;">SEC 2.2 (Artificial Intelligence)</p>		<p style="color: magenta;">CO-6</p> <p>This course aims to introduce the fundamental concepts of Artificial Intelligence technologies, their implications and their potential applications in various fields. This course will inspire the students with innovative thinking.</p> <p>Course Outcome</p> <ol style="list-style-type: none"> 1. Define and explain the fundamental concepts and subfields of AI. 2. Identify real world applications of AI across various industries. 3. Analyze the ethical, social and economic implications of AI. <p>Recognize the potential of AI to drive innovation and transformation in different domains</p>

3 rd	DSCC 3 (Real Analysis)	Unit – I: (Sets in R) Unit – II: (Real Sequence) Unit – III: (Infinite Series)	<p>CO-7</p> <p>This course is intended to expose students to the basic ideas of Real Analysis, a part of mathematical analysis which is considered to be the base of mathematics.</p> <ol style="list-style-type: none"> 1) This will introduce students to notions of boundedness, completeness, neighborhood, open set, closed set etc. and pioneer theorems like Bolzano – Weierstrass theorem. Heine Borel Theorem etc. to be mentioned among various other important results. 2) Students will know about sequences, subsequences and their convergence along with important theorems like sandwich theorem, Nested Interval theorem, Cauchy criterion etc. 3) Infinite series and their convergence and various tests for convergence like comparison test, limit test, Gauss test etc and alternate series are points of highlight in this unit. <p>This course will help students in further studies of real and complex analysis in coming semesters.</p>
3 rd	DSCC 4 (ODE I and Group Theory I)	Group A (ODE I)	<p>CO-8</p> <p>On completion of ODE-I course, the students will acquire knowledge on</p> <ol style="list-style-type: none"> 1) acquire elementary knowledge and skill of solving problems on certain types of linear and non- linear ordinary differential equations, also acquire knowledge on certain types of second order ordinary differential equations and their applications in Applied Science. 2) solving various problems related to Power series solution, Biological & Mechanical model, vector calculus which has useful applications in various branches of Mathematics and Physics.

3 rd		<p><u>Group B</u> (Group Theory I)</p>	<p>The Group Theory-I course is designed as a basic theory of Abstract Algebra. In this course students are go through</p> <ol style="list-style-type: none"> 1) the study of definition and examples of groups, subgroups & their properties which are the pivotal concepts of modern algebra. 2) the next step of defining special types of groups i.e., cyclic groups and its properties 3) the concept of permutations, their types and algebra of permutations. 4) the ideas of cosets, order of group & its elements, Lagrange's theorem & its consequences including Fermat's Little theorem. <p>the study of Normal subgroups, Quotient group, Cayley's theorem, Homomorphism and Isomorphism of groups which are very essential to study unknown groups.</p>
3 rd	<p>SEC 3-3 (Linear Programmin g and Rectangular Games)</p>		<p><u>CO-9</u></p> <p>On completion of this course, the students will acquire</p> <ol style="list-style-type: none"> 1) fundamental knowledge on the theory of basic and basic feasible solutions and their properties, convex sets based on the knowledge of linear algebra studied in previous semesters. 2) skills solving a Linear Programming Problem by Simplex Method. They also gain the knowledge of solving duality, transportation problems, assignment problems and travelling salesman problems. <p>This course is very much important in present day Mathematics, like in the field of Operation Research, Modelling, Financial Mathematics.</p>

<p>4th</p> <p>4th</p>	<p>DSCC 5 (Theory of Real Functions)</p>	<p>Group-A: (Limit and Continuity of Functions)</p> <p>Group-B: (Differentiability of Functions)</p>	<p><u>CO-10</u></p> <p>Limit and Continuity This course will help students to know about Very important notions of limit, continuity, uniform continuity of a real function with $\epsilon - \delta$ approach. Many important results including Sequential criterion will help students in due courses.</p> <p>Differentiability Differentiability of a real function at a point, relation between continuity and differentiability of a function and related theorems, Rolle's theorem, Cauchy's MVT to be specially mentioned with.</p> <p>The concept of maxima, minima of a function in an interval and their application. This portion plays an important role in applied sciences, specially on ODE and Multivariate Calculus which is also in the UG course.</p> <p>This course is the base for any further studies of analysis and many other fields and also help them to grow analytical ideas in the real field and make mathematical arguments within this system.</p>
<p>4th</p>	<p>DSCC 6 (Mechanics-I)</p>		<p><u>CO-11</u></p> <p>On completion of this course, the students will acquire knowledge on</p> <ol style="list-style-type: none"> 1) Reduction of forces in 2D and 3D systems. 2) condition of stability and instability of a system by a system of forces 3) how the frictional force work with the interaction two bodies and also the stability in the environment of frictional force 4) virtual work and one can check the condition of stability using virtual work done.

			<p>5) rectilinear motion of a particle in straight line and in two and three dimension</p> <p>6) orbital motion and its stability. It will help in research of artificial satellites.</p> <p>7) work, power, energy and energy conservation are maintained in different systems.</p> <p>8) linear and angular momentum principal and energy conservation in many particle systems.</p> <p>Overall the study of this course helps to research particle physics.</p>
4th	DSCC 7 (Partial Differential Equation-I and Multivariate Calculus-I)	Group-A: (PDE-I)	<p><u>CO-12</u></p> <p>On completion of this course, the students will acquire</p> <ol style="list-style-type: none"> 1) elementary knowledge and skill for solving problems of certain types of linear and non-linear partial differential equations, also acquire knowledge on certain types of second order partial differential equations and their applications in Mathematical Physics. 2) Concept of Cauchy problem, Cauchy-Kowalewskaya theorem, Cauchy problem of finite & infinite string and their applications in Mathematical Physics. 3) elementary knowledge and skill of solving problems on multiple integral and centre of gravity, surface and volume of revolution. 4) knowledge on vector calculus and their applications in Mathematical Physics.

4 th	DSCC 7 (Partial Differential Equation-I and Multivariate Calculus-I)	Group- B:(Multivar iateCalculus-I)	<p>Multivariate Calculus I:</p> <p>Outcome of this course is</p> <p>i) to acquire knowledge about the limit, continuity and differentiability of functions of more than one variable which is an extension of knowledge of calculus of single variables.</p> <p>ii) that there are huge applications like finding maxima and minima, saddle points of different functions, Curvature, Envelope which are very much required in Geometry, Physics etc.</p>
4 th	DSCC 8 (Group Theory-II and Ring Theory-I)	<p>Group-A: (Group Theory-II)</p> <p>Group-A: (Ring Theory-I)</p>	<p>CO-13</p> <p>Group theory II:</p> <p>The students who had preliminary ideas of definition and properties of groups, now in this course</p> <ol style="list-style-type: none"> 1) Acquire conceptual knowledge about automorphism groups and its properties and applications of factor groups to automorphism groups. 2) Can extend their skills to study further about external and internal direct product of groups, the existence of some well-known theorems such as Cauchy theorem, converse of Lagrange’s theorem and Fundamental theorem only on finite Abelian groups. <p>Ring Theory - I</p> <p>Ring is an ordered structure with two operators and it is a generalization of group theory which the students have already read in CC4 (semester 1). In this course the students</p> <p>1.get an idea of the ring as an arbitrary set with two operators. Definition, examples, properties of subring, subfield, integral domains and field and their properties.</p>

4 th		Group-A: (Ring Theory-I)	<p>2.Acquire knowledge about some well-known theorems such as isomorphism theorem, correspondence theorem.</p> <p>3.These ideas are very important to study advanced algebra, linear algebra in semester 5 of undergraduate courses as well as for further study of any branch of mathematics.</p>
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NOTE: The detailed syllabus of Sem V, Sem VI, SEM VII and Sem VIII has yet to be obtained from the Mathematical Board of Studies of University of Calcutta (Parent University).

DEPARTMENT OF MICROBIOLOGY

Programme Specific Outcomes

PSO1: Students of the B.Sc. (Major) Microbiology 4-year programme will learn to use scientific knowledge with logic and reasoning as they explore a wide range of contemporary topics of basic microbiology such as Bacteriology, Virology, Biochemistry, Microbial Physiology, Immunology, Cell Biology, Molecular Biology, Genetics, Systems Biology, Immunology and Molecular biology as well as the applied aspects of microbiology such as Industrial Microbiology, Food and Dairy Microbiology, Environmental Microbiology, Medical Microbiology and Microbial Biotechnology.

PSO2: Students will gain knowledge of various biotechnological applications of microorganisms and industrially important substances produced by microorganisms. They will learn the unique role of microbes in genetic engineering techniques which can be used for benefit of mankind. The course will help them to understand the microbes, their behavior, survivability strategies and ways of interactions within the biome.

PSO3: Students will acquire and demonstrate proficiency in good laboratory practices in a microbiological laboratory and be able to explain the theoretical basis and practical skills of the tools/technologies commonly used to study this field.

PSO4: Students will acquire confidence through practicing strong oral, writing and entrepreneurship skills through seminars, group discussions, research projects and field visits. These practical exercises will motivate the students towards research, critical thinking, and practice a wide range of careers in global and public health.

PSO5: Graduates of the B.Sc. (Major) 4-year Microbiology programme will be informed citizens who can understand and evaluate the impact of new research discoveries in the life sciences, and will be able to pursue a wide range of careers, including biological and medical research in higher education institutions as well as careers in public and global health, scientific writing, environmental organizations, and food, pharmaceuticals and biotechnology industries.

Semester	Course Topics	Course Outcomes
I	CC 101: Introduction to Microbiology and Microbial Diversity	<ul style="list-style-type: none"> • To understand the history of development of Microbiology starting from the early years. • To study the diversity of Microbial World and Systems of classification of microorganisms. • To understand the scope of microbiology.
	CC 101-P: Introduction to Microbiology and Microbial Diversity	<ul style="list-style-type: none"> • To learn and maintain good laboratory practices and bio-safety measures in a microbiology lab • To understand the principles and applications of various laboratory instruments • Hand-on training of media preparation, inoculation for bacterial cultivation, etc. • To learn the techniques like micrometry, haemocytometry, etc.
	SEC 101: Food fermentation techniques and packaging	<ul style="list-style-type: none"> • To study about fermented foods, their various types and production. • To understand the packaging techniques and quality control processes
	MCB-IDC: Introduction and scope of Microbiology	<ul style="list-style-type: none"> • To understand the history of development of Microbiology. • To study the diversity of microorganisms with their systems of classification. • To learn about different types of microscopes and sterilization techniques. • To learn about the involvement of microorganisms in human health and environment. • To study industrial and food microbiology.
II	CC 102: Bacteriology	<ul style="list-style-type: none"> • To study the cell organization, bacteriological and staining techniques. • To learn about different types of microscopes. • To understand the reproduction, growth and nutrition of a bacteria. • To study the important archael and eubacterial groups.
	CC 102-P: Bacteriology	<ul style="list-style-type: none"> • To handle microscopes under various magnifications • To learn and use different types of stains for

		<p>microbial observations under microscope</p> <ul style="list-style-type: none"> • To become skilled in techniques like streaking, spread plate, pour plate technique for isolation of pure culture • To understand various preservation methods
	SEC: AI	<ul style="list-style-type: none"> • To learn about the fundamental concepts and subfields of AI. • To identify real world applications of AI across various industries. • To analyze the ethical, social and economic implications of AI. • To recognize the potential of AI to drive innovation and transformation in different domains.
	MCB-IDC: Introduction and scope of Microbiology	<ul style="list-style-type: none"> • To understand the history of development of Microbiology. • To study the diversity of microorganisms with their systems of classification. • To learn about different types of microscopes and sterilization techniques. • To learn about the involvement of microorganisms in human health and environment. • To study industrial and food microbiology
III	CC 201: Biomolecules and Bioenergetics	<ul style="list-style-type: none"> • To learn the concept of bioenergetics and about the detail of several biomolecules like carbohydrates, lipids, aminoacids, proteins, nucleic acids, vitamins and enzymes.
	CC 201-P: Biomolecules and Bioenergetics	<ul style="list-style-type: none"> • To gain knowledge about solution properties like pH; buffer preparation, etc. • To know the different qualitative and quantitative tests for various biomolecules • To study protein structures through models • To study DNA types through models
	CC 202: Microbial Physiology and Metabolism	<ul style="list-style-type: none"> • To learn the effect of environment on microbial growth, nutrient uptake and transport. • To study different microbial metabolism like chemoheterotrophic, chemolithotrophic,

		phototrophic and nitrogen metabolism
	CC 202-P: Microbial Physiology and Metabolism	<ul style="list-style-type: none"> • To study and learn plotting the growth curve of <u>E. coli</u> • To learn how to calculate generation time and specific growth rate of bacteria • To learn the effect of temperature, salt, carbon and nitrogen sources on the growth of <u>E. coli</u>
	SEC201: Biofertilizers and Biopesticides	<ul style="list-style-type: none"> • To understand the concept of biofertilizers, symbiotic and non symbiotic nitrogen fixers, phosphate solubilizers and mycorrhizal biofertilizer. • To study the basics of biopesticides and bioinsecticides derived from microbes.
	MCB-IDC: Introduction and scope of Microbiology	<ul style="list-style-type: none"> • To understand the history of development of Microbiology. • To study the diversity of microorganisms with their systems of classification. • To learn about different types of microscopes and sterilization techniques. • To learn about the involvement of microorganisms in human health and environment. • To study industrial and food microbiology.
IV	CC 203: Molecular Biology	<ul style="list-style-type: none"> • To learn about the types of genetic material and its features. • To understand the central dogma including replication, transcription, translation and regulation of gene expression in prokaryotes and eukaryotes
	CC 203-P: Molecular Biology	<ul style="list-style-type: none"> • To learn the isolation procedure of genomic DNA from <u>E. coli</u> • To learn the principle and preparation of agarose gel electrophoresis • To understand the principle of UV spectrophotometer
	CC 204: Microbiological	<ul style="list-style-type: none"> • To learn aeromicrobiology, sampling

	analysis of Air and Water	<p>techniques and control measures.</p> <ul style="list-style-type: none"> • To study the microbiological analysis of water and the diseases.
	CC 204-P: Microbiological analysis of Air and Water	<ul style="list-style-type: none"> • To study and assess microbiological quality of water • To learn the step-wise procedure of water quality testing • To learn and try to understand the presence of microflora in the environment
	CC 205: Environmental Microbiology	<ul style="list-style-type: none"> • To learn about the microbial habitats and their interactions. • To study the waste management system, bioremediation and biogeochemical cycling.
	CC 205-P: Environmental Microbiology	<ul style="list-style-type: none"> • To analyse various soil properties • To learn isolation of microbes from various soil types • To study microbial activity qualitatively through enzyme estimation
	CC 206: Food and Dairy Microbiology	<ul style="list-style-type: none"> • To learn about various types of fermented foods, the methods of preservation, concept of prebiotics and probiotics. • To gain knowledge about the food borne diseases, food spoilage and the rapid detection methods of the pathogens.
	CC 206-P: Food and Dairy Microbiology	<ul style="list-style-type: none"> • To learn the detection technique of milk contamination • To learn isolation of spoilage microorganisms from spoiled food stuff • To learn the preparation process of Dahi

DEPARTMENT OF PHYSICS

Programme Specific Outcomes

4-Year Physics Honours/Honours with Research (PHSM)

Semester	Name of Course/Code	Course Outcomes
I	DSC-1 Basic Physics-I	CO1 1) The students will get an overview on mathematical tools required to study theoretical and experimental physics. 2) Students will learn basics Physics based on Newtonian Mechanics and earn general ideas about how the universe works. 3) They learn to experimentally verify different laws based on Newtonian Mechanics.
I	SEC-1 Introduction to Graph plotting & Programming	CO2 1) They learn basic computer programming and python data types. 2) They are able to solve problems using python and 2D plotting using Gnuplot.
II	DSC-2 Basic Physics-II	CO3 1) The students will be given an idea about electricity and magnetism with various electromagnetic phenomena such as electromagnetic induction, electrical circuits, etc. 2) They also learn the fundamental laws of thermodynamics, the principle of operation of engines and refrigerators and limitations related to ideal gas. 3) The students will be able to perform various experiments on electricity and magnetism and will learn to handle various electrical equipment.
II	SEC-2 Scientific writing	CO4 1) Students will familiar with scientific writing tool LATEX. 2) They learn how LaTeX makes all writing tasks simpler, more visually appealing, more consistent, more reproducible and transparent. 3) They will learn how to prepare a scientific article containing figures, tables and mathematical equations in a presentable form.
III	DSC-3 Waves & Optics	CO5 1) The students will be given basic knowledge in vibration and wave motion. 2) They will get an insight about various optical phenomena like interference, diffraction and polarization of light. 3) They will learn applications of optics and

		familiarizes with experimental instruments.
III	DSC-4 Mathematical Physics – I	CO6 1) Students will learn more advanced topics of mathematical physics like Fourier series, series solutions of the differential equations, some special functions and their applications. 2) Students will familiar with different packages of Python like numpy, scipy, matplotlib etc. and apply them to find the solutions of matrix algebra, numerical integration, interpolation, differential equation and curve fitting.
III	SEC-3 Arduino	CO7 1) Arduino offers to learn basic electronics, circuit connection to breadboard, programming language and IDE. 2) Projects based on Arduino enable students to design circuits and enrich their computer programming skills.
IV	DSC-5 Modern Physics	CO8 1) Students learn about old quantum theory, Schrodinger's equation, basics of nuclear physics and radioactivity. 2) They will also learn fundamental principle of Laser and its applications. 3) Laboratory classes will enable students to determine the value of Planck's constant, study of photoelectric effect, verification of Stefan's law of radiation, determination of e/m of electron and behaviour of tunnel diode.
IV	DSC-6 Electromagnetism	CO9 1) This course teaches the students about the origin and different properties of the EM waves in bounded and unbounded media. 2) Electromagnetic origin of wave optics and polarization is also being discussed in this course. 3) Students learn the verification of different physical laws related to the EM wave propagation and polarization in laboratory classes.
IV	DSC-7 Mathematical Physics – II	CO10 1) The students will learn advanced mathematical physics such as solutions of 2 nd order differential equations and its application, linear vector space and tensor analysis. 2) They will also learn concept of special theory of relativity which is extremely essential for understanding the physical world beyond Newtonian mechanics.

		3) They learn to handle numerical problems involving solutions of ODEs, PDEs and Laplace equation using Python.
IV	DSC-8 Classical Mechanics and Special Theory of Relativity	CO11 1) The students will learn Lagrangian formulation in mechanics and importance of variational calculus in Physics. 2) They will also learn concept of special theory of relativity which is extremely essential for understanding the physical world beyond Newtonian mechanics.
V	DSC-9 Analog Electronics	CO12 1) They learn basics of analog electronics, fundamentals of semiconductor physics and its application which is the heart of the modern-day electronic devices. 2) In laboratory classes, they are familiarized with the electronic devices and to design and perform experiments with electronic components.
V	DSC-10 Nuclear & Particle Physics	CO16 1) Nuclear Physics introduces the student to the concept of nuclear reaction, interaction of nuclear radiation with matter and detectors for nuclear radiation. 2) They also learn about fundamental particles and their properties.
V	DSC-11 Quantum Mechanics	CO13 1) Students will be taught quantum mechanics theory based on Schrodinger equation. 2) They also learn atomic spectra and energy distribution in electric and magnetic fields. 3) The numerical solution of some of the Schrodinger equations in Python will be taught in the laboratory.
V	DSC-12 Thermal Physics and Statistical Mechanics	CO14 1) Students will be able to understand the behaviour and dynamics of a system comprising of a large number of particles both classically and quantum mechanically. 2) They learn Python programming to analyse the behaviour of a collection of particles through numerically calculate partition function and other physical properties.
VI	DSC-13 Digital Electronics	CO15 1) Students learn about number systems, basic gates, counters and registers. 2) In practical classes, they learn to design and construct universal gates, half adders and full adders,

		flip-flops on breadboard.
VI	DSC-14 Solid State Physics	CO16 1) This course explains the physical properties of the material in solid states as an application of quantum mechanics. 2) The details of crystallography, basis of semiconductors and superconductors are also theoretically addressed. 3) They learn to verify different laws and properties of materials in laboratory.
VI	DSC-15 Atomic, Molecular, and Laser Physics	CO17 1) Students will learn about atomic and molecular spectra. 2) Students will be able to learn the basic and the generation of different types of LASERS and their applications. 3) They learn principles and applications of holography.
VII	DSC-16 Advanced Mathematical Physics	CO18 1) The students will learn advanced mathematical physics such as solutions of higher order differential equations and its applications, Green's function, Bessel's function etc. 2) They learn to handle numerical problems involving solutions of ODEs and others.
VII	DSC-17 Advanced Classical Mechanics	CO19 1) The students will learn theories relating advanced classical mechanics. 2) They are able to know various phenomena of nonlinear dynamics.
VII	DSC-18 Advanced Quantum Mechanics-I	CO20 1) Students will be taught quantum mechanics in advanced level. 2) They also learn atomic spectra and energy distribution in electric and magnetic fields.
VII	DSC-19 Electronics & Instrumentation	CO21 1) Students learn how measurements are taken to get much better results and various precautions taken during measurements. 2) They learn how various instruments like function generator, oscilloscope, digitalmultimeter works both theoretically and experimentally.
VII	DSC/DSE -20 Atomic & Molecular Physics / Laser and Fiber Optics	CO22 1) Students will be able to learn the basic and the generation of different types of LASER and their applications. 2) They learn principles and applications of

		holography.
VIII	DSC-21 Advanced Electrodynamics	CO23 1) This course teaches the students about the origin and different properties of the EM waves in bounded and unbounded media in advanced level. 2) They will know gauge theories and electromagnetic properties in different media.
VIII	DSC-22 Advanced Statistical Mechanics	CO24 1) Students will be able to understand quantum statistical mechanics. 2) They learn Ising model, Landau theory etc.
VIII	DSC-23 Advanced Quantum Mechanics-II	CO25 1) Students will be taught quantum mechanics in advanced level. 2) They also learn scattering theory and relativistic quantum theory..
VIII	DSC/DSE-24 Nuclear & Particle Physics / Nanomaterials & Applications	CO26 1) The exciting world of nanoscience and nanotechnology is being discussed here through the basic physics underlying the concept of nanoparticles. 2) Students learn the synthesis, properties and various applications of the nano materials.
VIII	DSC/DSE-25 Condensed MatterPhysics / IntroductoryAstrophysics & Cosmology	CO27 1) This course explains the physical properties of the material in solid states as an application of quantum mechanics. 2) The details of advanced condensed matter Physics as well as Astrophysics and Cosmology. 3) They learn to verify different laws and properties of materials in laboratory.

3-Year B.Sc. Multidisciplinary (MDC)

Semester	Name of Course/Code	Course Outcomes
I	GCC-1 Basic Physics-I	CO1 1) The students will get an overview on mathematical tools required to study theoretical and experimental physics. 2) Students will learn basics Physics based on Newtonian Mechanics and earn general ideas about how the universe works. 3) They learn to experimentally verify different laws

		based on Newtonian Mechanics.
II	SEC-1 Introduction to Graph plotting & Programming	CO2 1) They learn basic computer programming and python data types. 2) They are able to solve problems using python and 2D plotting using Gnuplot.
II	GCC-2 Basic Physics-II	CO3 1) The students will be given an idea about electricity and magnetism with various electromagnetic phenomena such as electromagnetic induction, electrical circuits, etc. 2) They also learn the fundamental laws of thermodynamics, the principle of operation of engines and refrigerators and limitations related to ideal gas. 3) The students will be able to perform various experiments on electricity and magnetism and will learn to handle various electrical equipment.
III	GCC-3 Waves & Optics	CO4 1) The students will be given basic knowledge in vibration and wave motion. 2) They will get an insight about various optical phenomena like interference, diffraction and polarization of light. 3) They will learn applications of optics and familiarizes with experimental instruments.
III	GCC-4 Mathematical Physics	CO5 1) Students will learn more advanced topics of mathematical physics like Fourier series, series solutions of the differential equations, some special functions and their applications. 2) Students will familiar with different packages of Python like numpy, scipy, matplotlib etc. and apply them to find the solutions of matrix algebra, numerical integration, interpolation, differential equation and curve fitting.
IV	GCC-5 Modern Physics	CO6 1) Students learn about old quantum theory, Schrodinger's equation, basics of nuclear physics and radioactivity. 2) They will also learn fundamental principle of Laser and its applications. 3) Laboratory classes will enable students to determine the value of Planck's constant, study of photoelectric effect, verification of Stefan's law of radiation, determination of e/m of electron and behaviour of tunnel diode.
IV	GCC-6 Electromagnetism	CO7 1) This course teaches the students about the origin and

		<p>different properties of the EM waves in bounded and unbounded media.</p> <ol style="list-style-type: none"> 2) Electromagnetic origin of wave optics and polarization is also being discussed in this course. 3) Students learn the verification of different physical laws related to the EM wave propagation and polarization in laboratory classes.
V	GCCC-7 Analog Electronics	<p>CO8</p> <ol style="list-style-type: none"> 1) They learn basics of analog electronics, fundamentals of semiconductor physics and its application which is the heart of the modern-day electronic devices. 2) In laboratory classes, they are familiarized with the electronic devices and to design and perform experiments with electronic components.
V	GCC-10 Nuclear Physics	<p>CO9</p> <ol style="list-style-type: none"> 1) Nuclear Physics introduces the student to the concept of nuclear reaction, interaction of nuclear radiation with matter and detectors for nuclear radiation. 2) They also learn about fundamental particles and their properties.
VI	GCC-13 Digital Electronics	<p>CO10</p> <ol style="list-style-type: none"> 1) Students learn about number systems, basic gates, counters and registers. 2) In practical classes, they learn to design and construct universal gates, half adders and full adders, flip-flops on breadboard.
VII	GCC-14 Instrumentation	<p>CO11</p> <ol style="list-style-type: none"> 1) Students learn how measurements are taken to get much better results and various precautions taken during measurements. 2) They learn how various instruments like function generator, oscilloscope, digital multimeter works both theoretically and experimentally.

DEPARTMENT OF ZOOLOGY
Programme Specific Outcomes

PO1:

The course in Zoology will provide the students with knowledge about various disciplines, intricacies of the science of Zoology and a graduation certificate and degree with major as well as minor/MDC status empowering the students to join the budding workforce for the development and progress of the nation.

PO2:

Zoology is the study of all animal life; from primitive microscopic malaria-causing protozoa to large advanced mammals, across all environmental spheres from red deer in mountain forests to dolphins in deep oceans, and from underground burrowing voles to golden eagles in the skies. The diverse and multidimensional nature of the course will allow an understanding and appreciation of the world around us in all its fragile miracles.

PO3:

The course will expose them to the wonder of evolution and life as a whole, it will generate an introspection of the fragility of life itself and the immense biodiversity and its limitations.

PO4:

After completion of the course, the successful students will be able to apply for a multiple range of job opportunities and it will provide them the edge to grow and develop more and even switch careers amongst different sub-disciplines since Zoology offer a multidisciplinary approach to study.

PO5:

The diffident hands on laboratory courses will enhance the powers of observation, analysis, data collection, interpretation and result analysis of diverse disciplines and sub disciplines, it will aid in future research endeavors as well as progression to higher studies. The value added courses will empower them to venture into newer disciplines in research, teaching, as well as other job prospects in future

PO6:

The course will empower the students in different types of data presentation methods, make them ready for scientific seminars, literature survey, paper writing and analysis, which in the

long run will be immensely helpful to them in pursuing any field of study of discipline, and even up gradation will be essential for better job prospects and employment generations.

PROGRAMME SPECIFIC OUTCOME

PSO1:

The students will be able to appreciate, understand and gather knowledge about diverse intricacies of cell biology, the structure of the cell membrane, its convolutions and dynamics, along with cell organelles, their structure and function, which will give holistic knowledge on cell structure and functional aspects of its components.

PSO2:

In this programme, the students will gain information of biochemistry, especially on the different structural and functional attributes of carbohydrates, protein and lipids, their metabolisms, concepts of free radicals and antioxidants, enzymology inclusive of enzyme classification and functional models and kinetics. It will also inform them with hands on practical experience on the use and process of different methods used in study of biochemistry along with estimation. It also will help them to understand the implication of biochemical taxonomy, application of biochemistry in various fields of Zoology.

PSO3:

The students will be able to appreciate, understand and enhance their knowledge based on insects and their life cycle, basics of entomology. The major outcomes of this programme will include the information about biodiversity of insects, adaptive features in insects, physiological adaptations in insects, along with their general classification. This course will orient the students to the tangling of the life cycle of pests, their control and damage dynamics, along with understanding of economic zoology and its application that can aid in development of future careers.

PSO 4:

Students in this programme specific outcome will expose to the concept of sustainability in applied economic zoology. This programme allows them to grasp the ideas of development of sustainable systems for aquaculture. This will not only help them to gain understanding of aquaculture methods, but will also empowered them to learn about various opportunities of future startups involving

PART I: SEMESTER 1		COURSE OUTCOME	COURSE OUTCOME NUMBER
CORE COURSE-1: Cell Biology Major/Minor/ MDC:CC1-TH	UNIT 1: Plasma Membrane	The students will learn about the structure of the plasma membrane, its composition dynamics and functions. Along with these, students will learn about various models of plasma membrane.	CO1
	UNIT 2: Cytoplasmic Organelles I	This unit will inform the student about cellular organelles, their ultrastructure and functions. They will also learn about protein sorting, glycosylation, folding and transport mechanisms along with structural and functional attributes of liposomal entities.	
	Unit3: Cytoplasmic organelles II	Here, the students will be able to acquire an in-depth knowledge about structural and functional attributes of mitochondria including endosymbiotic hypothesis. It will also involve discussion on chemiosmotic hypothesis and mechanism of aerobic energy production. Structural and functional dynamics of peroxisome and centrosomes will also be highlighted.	
	Unit 4: Cytoskeleton	This unit will inform the student about cytoskeleton, especially structure and types of actin, microtubules and intermediate filaments. In addition, it will inform about composition and function of extracellular matrix and cellular junctions	
	Unit 5: Nucleus	From this unit students will gain knowledge about nuclear envelope, nuclear pore complex, Kinetochore and centromeric DNA; Chromatin and levels of its packaging. Euchromatin and Heterochromatin, Position effect variegation. Chromatin remodeling complex	

	Unit6: CellCycle	In this unit, the students will learn about cell cycle and its phases, role of protein kinase system, MPF. The process of DNA maturation and replication in cell cycle will be highlighted with tidbits of Cancer biology	
	Unit 7: Cell Signaling	The students will learn about cell communication, cell signaling along with signaling molecules and receptors	
	Unit 8: Tools and Techniques in Cell Biology	This unit will inform the student about animal cell culture techniques. It will empower them with knowledge of ultracentrifugation and techniques of sample preparation for EM. This unit will also inform about types of different microscopes and their applications along with cryofixation and its uses	
Cell Biology Lab; ZOOA-CC-1-P		This will illustrate hands on practical experiences on the use and process of different methods used in study of cell biology	CO2
PART I: SEMESTER2			
CORE COURSE-2: Biochemistry Major/Minor/ MDC; CC2-TH	Unit 1: Carbohydrates	This unit will inform the student about structure, classification and properties of different carbohydrates including the differences between reducing non-reducing sugars and the physiological importance of carbohydrates	CO 3
	Unit2: Proteins	Here, students will get information about structure of proteins and amino acids along with chemical properties and classification of proteins which will help them to acquire holistic knowledge on basics of protein chemistry	
	Unit 3: Lipids	This unit will inform the student about the lipids and involve discussion on classification and properties of lipids with essential and non-	

		essential fatty acids, iodine and saponification number etc.	
	Unit4: Enzymes	Unit 4 is associated with enzymology that will enable the students to learn about nomenclature and classification of enzymes, factors controlling enzyme actions, theories of enzyme functions. It will also focus on rate and factors affecting enzyme activity and enzyme kinetics	
	Unit5: Carbohydrates Metabolism	In this unit the students will learn about carbohydrate metabolism and enzymatic pathways of carbohydrate metabolism	
	Unit6: Protein Metabolism	Students will gain knowledge about different mechanism of protein metabolism, pathways of interactions along with the fates of the carbon skeletons	
	Unit7: Lipid Metabolism	In this unit the students will learn about mechanism of lipid breakdown by oxidative processes and fatty acid biosynthesis	
	Unit 8: Nucleic acid Metabolism	Unit 8 will allow the students to learn about process of breakdown of nucleic acids	
	Unit9: Free radicals and Antioxidants	The students will gain knowledge about the basic concepts of free Radicals and antioxidants with their impacts	
Biochemistry Lab;CC-2-P		The students will learn about hands on practical experience on the use and process of different methods used in study of biochemistry along with estimation	CO4
SEC-1: Applied Entomology Major; SEC-1-TH	Unit1: Basics of Entomology	Unit 1 deals with insect diversity and adaptation, physiological adaptation in cockroach, and general characteristics of class Insecta and mites	CO5
	Unit 2: Medical Entomology	Students will learn about concept of vectors, biology of Anopheles, Culex, Aedes, Musca domestica, ticks and about forensic entomology	

	Unit 3: Agricultural Entomology	This unit give in-depth knowledge about insect pest; Economic Injury Level, Economic Threshold Level, Dynamics of EIL, Insect Pest control and Integrated Pest Management	
	Unit 4: Sericulture	Students will acquire knowledge about types of silk moths with special reference to their scientific name, geographical distribution, and host plants. Life cycle of <i>Bombyx mori</i> ; Structure of Silk Gland; Voltinism, Rearing of mulberry silkworm; Reeling and extraction of silk; Mulberry cocoon management; Mulberry plant types and cultivation; Common diseases and pests of mulberry silkworm and their control measures; Prospects of Sericulture in West Bengal;employment potential in sericulture	
	Unit 5: Apiculture	This unit will give information about various domesticated species of honeybee; social organization and life cycle of honeybee; modern method of beekeeping, pests, parasites and diseases and their control measures and bee-economy	
Applied Entomology Lab: SEC-1-P		The students will be able to know about hands on practical experience on the use and process of different methods used in study of Entomology, insect biodiversity, Economic zoology involving pestology. Knowledge about the different cultivable fishes and fishery, sericulture techniques, as well as medically important insects; disease progression, identification. They will also be provided field trips to agricultural farms for hands on experience	CO6
SEC- 2Aquac	Unit1: Basics of Ideaof Fish	In this unit, the students will learn about required qualities for fish	CO7

ulture Major; SEC-2-TH	Biology	cultivation of fishes, both indigenous and exotic	
	Unit 2: Sustainable Aquaculture System	In unit, the students will learn about sustainability in aquaculture along with water quality maintenance and preparation of fishery. They will also be informed about types of fish culture techniques and types of hatcheries	
	Unit3: Recent Advancement of Aquaculture	The students will be able to know about aquarium fisheries, management of aquarium fisheries along with harvesting, transport and maintenance. They will also gather knowledge on application of aquaponics and application of remote sensing in capture fishery	
	Unit4: FinFish pathology	This unit would fortify the students with knowledge in fish diseases and their pathogens, types of diseases, their symptoms and control	
	Unit5: Applied Aquaculture	In this unit, the students will learn about breeding techniques of prawn, fish and artificial pearl culture	
AquacultureLab :SEC-2-P		Student will gain in-depth knowledge in identification and classification of economically important fish, will obtain first-hand knowledge on operation of fish farm by field visit	CO 8
IDC-1: Animal Biology IDC-1-TH	Unit1: Animal Diversity	Students would be able to disseminate knowledge about animal biodiversity, classification, general characters with examples	CO 9
	Unit2: Genetics	Students should be equipped to understand the basic principles of inheritance in genetics along with sex determination and chromosomal mutation	
	Unit3: Biodiversity and Wildlife	This unit shall allow the student to gain comprehensive knowledge about biodiversity-types, and causes of destruction, biodiversity indices, conservation. Besides they will learn about indigenous	

		knowledge of biodiversity	
	Unit 4: Insect Vectors	This domain will illustrate the role of vectors in disease transmission, both medical and biological. Besides they will be informed about malaria, its causes, control & vector biology	
	Unit5: Laboratory techniques and Instrumentation	The students will get information regarding basics of light microscopy principles of colorimetry and application along with centrifugation	
Animal Biology Lab:IDC- 1-P		The students will get hands on training on karyotype analysis, identification of animals, Besides they will acquire knowledge about biodiversity through fieldtrip	CO 10
SECG ForMDC Applied Zoology-Theory	UnitI: Agricultural Entomology	This unit is based on agricultural entomology and the students will learn about pests, their types and control, both non-mammalian and mammalian pests along with Integrated pest management	CO 11
	Unit II: Sericulture	In the unit the techniques of sericulture methods, types of silkworms and their life cycles will be informed to the students. They will also learn about techniques of sericulture, their diseases and control	
	Unit III: Apiculture	This unit will be supportive for startups in apiculture as it will inform about different types of honey bees, their life cycles and social organization. Besides, it will inform about process of bee culture and honey extraction and by products of apiculture and their uses	
	Unit IV: Vermiculture	In this unit the students will learn about natural methods of sustainable agriculture using vermiculture. It will also inform them about process of vermicomposting and their application against chemical fertilizers and its advantages	
	Unit V: Aquaculture	Student will gain in-depth knowledge in different techniques of aquaculture involving	

		methodologies of prawn culture, different varieties of prawns used for culture, carp culture practices and concepts etc. It will also inform them about mechanism of induced breeding and its economic applications including integrated fish farming	
	Unit VI: LiveStock Management	This domain will illustrate about applied zoology inclusive of diary management, Vaccination programme, types of breeds used in diary control and utilization of byproducts	
	Unit VII: Lac Culture	This unit will allow the students to learn about different techniques of lac culture which will include process of lac cultivation, control and management of lac cultivation. It will also involve applications and knowledge of lac culture for future startups	
SECG For MDC Applied Zoology- Practical		This domain will illustrate hands on practical experience on the use and process of different methods used in study of economic zoology along with procedure of different protocols of economic zoology as well as learns identification of different organisms used in the practices. They will also learn hands on experience on identification and control of pests	CO 12

fishery, applied aquaculture, fish diseases and their pathology and control as well as identification and classification systems. This program is extremely important in self-sustainability as it will enhance the opportunities and knowledge of aquaculture farming and business development as career options in addition to the usual avenues associated with zoology.

PSO 5:

In this programme, students will gain information on the basics of biodiversity, classification, general characters and examples which will give them an idea on biodiversity. This programme is essentially important from the point of conservation of nature and natural resources and wildlife as insufficient information is one of the major reason of loss of biodiversity .The outcome of this

programme will provide a solid background knowledge on the wild life, their classification, conservation strategies, the requirement of conservation for the future planning and direction regarding the same. The programme will also emphasize on the basic genetics for the interdisciplinary course students while providing hands on practical experience in genetic analysis.

PSO6:

In this programme, the students will gain information on the knowledge base essential for development of their own resources and career as entrepreneurs in the field of applied and economic zoology. This program specific outcome will empower the students with complete knowledge on the different aspects of farming involved in economic and applied zoology involving multiple domains like agricultural entomology and the students will learn about pests, their types and control, sericulture methods, types of silkworms and their life cycles, apiculture, vermiculture, diary and livestock management as well as culture of lac and its economic benefits. This programme is essentially cued to the self-development as entrepreneurs as well as scientific endeavors of the students.

DEPARTMENT OF BOTANY
Programme Specific Outcomes

Program Learning Outcomes:

1. Define the fundamental concepts underlying the physiological and genetic characteristics of plant species.
2. Comprehend the use of taxonomic tools essential for plant identification and classification.
3. Identify the interrelationship of evolution, ecological interactions, and biodiversity.
4. Apply basic scientific concepts to explain plant-related phenomena.
5. Organize learning concepts into coherent frameworks as the foundation of critical thinking.

Course Learning Outcomes

Phycology

1. Identify the morphological and physiological traits characterizing algae.
2. Compare the traits of the major algal groups.
3. Review algal features that are related to the evolutionary history of plants.
4. Classify the role of algae as environmental and economic resources.

Bryophytes

1. Identify distinguishing morphological, anatomical, physiological, reproductive, and adaptive characteristics of the major groups.
2. Describe the distributions and classification systems.
3. Identify the major groups and their evolutionary relationships.
4. Use keys and identification manuals for identifying plants.
5. Review the ecological and economic importance.

Pteridophytes, Gymnosperms

1. Identify distinguishing morphological, anatomical, physiological, reproductive, and adaptive characteristics of the major groups.
2. Describe the distributions and classification systems.
3. To recognize the major groups and their evolutionary relationships.
4. Use keys and identification manuals for plant identification.
5. Review the ecological and economic importance.

Anatomy

1. Identify different parts of plant anatomical structures.
2. Identify, draw, and describe the anatomical structure of the root, stem, and leaf.
3. Analyze the dissected sections of root, stem, and leaf under the microscope.

Morphology

1. Identify and distinguish inflorescence, flower, fruit, and seed types with examples,
2. Analyze the vegetative and floral parts of angiosperms as diagnostic features of selected families.

Taxonomy

1. Explain the species concept.
2. Identify taxonomic principles and their application in plant nomenclature.
3. Identify diagnostic features, systematic position (Bentham & Hooker), and economically important plants (parts used and uses) of Monocotyledons and Dicotyledons.

Mycology

1. Identify the morphological and physiological traits characterizing Fungi.
2. Analyze how the fungi relate to other organisms.
3. Compare the traits of the major classes of fungi.
4. Discuss the importance of fungi in various ecological and economic roles.

Plant Pathology

1. Define the scope and importance of Plant Pathology.
2. Describe the principles and types of sterilization methods.
3. Discuss the prevention and control measures of plant diseases.

Palaeobotany

1. Define the basic concepts and scope of Paleobotany.
2. Classify the types of fossils and fossilization events of organisms.
3. Differentiate changes in plants throughout the geological time scale and describe their evolutionary relationships.

Cell Biology and Genetics

1. Describe the structural organization and function of intracellular organelles chromosomes and genes

2. Identify the structure and function of atoms, biomolecules, and chemical bonds
3. Differentiate between Mendelian and extra-chromosomal inheritance
4. Analyze the fundamental processes of cell signaling
5. Explain the DNA replication, damage, and repair mechanisms
6. Describe RNA synthesis and processing, Protein synthesis and processing, and the control of gene expression.

Microbiology

1. Describe microbial diversity relating to the cell structure, function, growth, and metabolism.
2. Explain the basic genetic systems of bacteria and viruses.
3. Demonstrate practical skills in fundamental microbiological techniques
4. Discuss the importance of fungi in various ecological and economic roles.

Plant Biotechnology

1. Define and illustrate the fundamentals of Recombinant DNA Technology.
2. Categorize the methods of gene transfer
3. Evaluate the role of Biotechnology in Plant, Animal, and Human welfare

Plant Physiology and Metabolism

1. Evaluate the abiotic and biotic factors that affect plant growth.
2. Describe the processes of Photosynthesis, Respiration, Nitrogen metabolism, Sensory photobiology, and Stress physiology
3. Define and interconnect the role of plant Growth hormones (Auxins, Gibberellins, Cytokinins, Ethylene) in plant physiology
4. Outline the biosynthesis and function of terpenes, phenols, and nitrogenous compounds

Phytochemistry and Medicinal Botany

1. Explore the uses of plants as medicine by traditional indigenous approaches.
2. Classify the techniques for drug evaluation.
3. Specify conservation practices of medicinal plants.

Economic Botany

1. Explain the concepts of centers of origin and their importance with reference to Vavilov's work.

2. Identify the economically important species of cereals, pulses, spices, beverages, medicinal, oil-yielding, fruits, vegetables, fiber-yielding, timber-yielding, and sugar-yielding plants along with their origin, morphology, and parts used.

Course Outcome Of CVAC Courses in Arts and Science

SL.NO.	TITLE OF THE COURSE	TYPE OF COURSES
1	Environmental Studies	Compulsory CVAC Course, to be taught in the 1 st and 2 nd semesters
2	Constitutional Values	Compulsory CVAC Course, to be taught in the 1 st semester.
3	Indian Knowledge System and its Applications	Compulsory CVAC Course, to be taught in the 2 nd semester
4	Hands on Machine Learning	
5	Domestic Applications of Electronics	
6	Occupational Health Disorders and the Importance of Ergonomics	
7	Lifestyle Diseases and their Prevention	
8	Value Oriented Life Skill Education	

Common Value Added Course (CVAC) Taught in the Institution

<u>Name of Course</u>	<u>Course Outcome</u>
Environmental Studies	<ul style="list-style-type: none"> • Understanding the complexity of factors relating to human interaction with the environment. • Awareness about environmental problems have both human and biophysical components, and gain knowledge of the general principles of human-environmental interactions, global habitability, environmental change and sustainable society • Understanding and using a demonstrative approach to environmental issues • Using critical thinking, problem-solving, and methodological approaches to understand the aspects of Environmental issues • To Gain Knowledge about the different environmental unrests and understand and evaluate the global scale of environmental problems

<p>Constitutional Values and Fundamental Duties</p>	<ul style="list-style-type: none"> • It enriches students by providing knowledge on the Indian Constitution, its values and goals. • It provides knowledge about relevance of Fundamental Duties and inculcates a sense of constitutionalism.
<p>Indian Knowledge System and its Applications</p>	<ul style="list-style-type: none"> • Indian knowledge system aims to support and facilitate research to solve contemporary societal issues. • IKS will promote heritage technology by bringing technology solutions to showcase the Indian heritage to Indians and the world. • There is immense scope through various mechanisms to disseminate and popularize authentic IKS knowledge to develop informed and confident citizenry.
<p>Domestic Applications of Electronics</p>	<ul style="list-style-type: none"> • Understand the basic concepts of semiconductor physics. Students will gain foundational knowledge of electronic components, circuits, and systems, enabling them to understand how electronic devices work. • To design and analyze various diodes and its applications. • To understand BJT and FET configurations. • To understand the importance of energy-efficient electronics and learn about smart home technologies, such as smart lighting, thermostats, and home security systems.
<p>Lifestyle Diseases and their Prevention</p>	<ul style="list-style-type: none"> • Enumerate the different causes and risk factors of life style diseases like atherosclerosis, hypertension, stroke, diabetes, obesity, nephritis and liver diseases. • Learn about the methods to diagnose the diseases and gain a basic knowledge regarding interpretation of the test results • Spell out the methods of prevention, treatment and management of the diseases • Identify healthy and unhealthy life habits and adopt better life style