

Programme Specific Outcome (PSO) and Course Outcome (CO)

BANGABASI EVENING COLLEGE

Affiliated to: University of Calcutta

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the institution are stated and displayed on website and communicated to teachers and students.

DEPARTMENT OF ENGLISH

Programme Specific Outcome (PSO) and Course Outcome (CO)

Name of the programme: B.A. in English (Under CBCS)

Year of Introduction: Session 2018-19 Programme Specific Outcome (PSO)

PSO 1: The programme seeks to familiarize students with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.

PSO 2: It enables them to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres. Students are then able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.

PSO 3: Students are encouraged to develop their writing & analytic skills in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.

PSO 4: Students are taught to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.

PSO 5: Finally the programme helps students to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.

Course Outcome (CO) A. Core Course

Semester -1 ENGA

CC 1: History of Literature and Philology (6 credits per week)

CO 1: This paper acquaints students with the historical, political, cultural, and social contexts that inform and influence literary texts belonging to a particular era. On completion of this course, students are able to identify major writers and their works in chronological order and point out literary trends of each historical period. This helps them situate the texts they read, later in the programme, in their proper contexts.

CO 2: The section on History of English language aims to equip students with the skill and insight necessary to analyze and describe changes in the structure of the English language from the earliest written records to the present day. At the end of the course, students are expected to demonstrate a thorough understanding of diachronic changes in English from Old English to Present day English, and the ability to situate those in their socio-political contexts. An understanding of the Scandinavian, French and Classical influence on present day English helps students to identify the etymological origins of words used daily.

ENGA CC2: European Classical Literature (6 credits per week)

CO 1: European literature dates back to ancient Greek and Roman times. Thereafter, much of the literature in different nations of Europe has continued to be influenced by these ancient classical texts. Homer is the source and origin of all great myth and legend, and *The Iliad* is the best introduction to the heroic world for students. Horace's *Epistles* are still considered unparalleled for refined and subtle logical thought.

CO 2: Ovid's 'Metamorphosis' is the source book for successive generations of writers, including Shakespeare in the sixteenth century and Kafka in the twentieth century. Plautus's 'Pot of Gold' offers students an interesting insight into Roman society, following the tradition of Greek New Comedy with its intrigues and complex plot, and is the model for comedies in English literature till modern times.

B. Generic Elective GE 1: Poetry and Short Story (6 credits per week) This course, offered to students from Departments other than English, consists of poetry written by Shakespeare, Shelley, Keats and Spenser and three modern short stories. In all, this course offers diverse texts belonging to different genres and contexts to give the student an overall idea about English literature. Apart from the appreciation of literature, at the end of the course, a student is expected to analyse literary texts critically.

C. Ability Enhancement Compulsory Course AECC 1: Communicative English (2 credits)

This course is offered to all students across all disciplines. At the end of the course, a student is expected to identify and correct sentence errors, read excerpts of fiction, creative non-fiction and essays, while analyzing the structural and sentence level arrangement of the writing and write in an effective manner that demonstrates an understanding of the basic concepts of grammar.

Semester 2 A. Core Course ENGA CC 3: Indian Writing in English (6 credits per week)

CO 1: Students are introduced to the rich heritage of Indian writing since Derozio, Toru Dutt and Sarojini Naidu, as well as to the increasingly modernist trends used in by Nissim Ezekiel, Ramanujan, Kamala Das and others. Bankim Chandra's 'Rajmohan's Wife', the first novel written in English by an Indian, offers insight into the late 19th century ethos of Bengal and holds great historical value. Mahesh Dattani's play introduces students to the complexities of modern urban Indian society.

CO 2: Thus, students acquire a comprehensive idea of the evolution of Indian writing in English and its great variety, as well as its increasing importance in modern world literature.

ENGA CC 4: British Poetry and Drama (14th -17th century) (6 credits per week)

CO 1: Modern English poetry dates from the Renaissance, with the greatest masters being Shakespeare, Sidney, Spenser. Next we have the Metaphysical poets who revolutionised the writing of poetry with their scholarly assimilation of diverse experiences expressed through complex images and conceits.

CO 2: Shakespeare's tragedy and comedy constitute the best possible initiation into the world of deep emotions and intellectual perceptions, blended with profound philosophy and aesthetic sublimation.

B: Generic Elective GE2: Essay, Drama and Novel (6 credits per week)

CO 1: Students from other departments who opt for English find a refreshing introduction to a creative, imaginative and artistic world through Lamb's essay, 'Dream Children', while they get an insight into the complex, ambiguous conditions of life in the postcolonial world in Orwell's essay.

CO 2: Shakespeare's romantic comedy offers a charming experience of a journey to a pastoral world, in contrast to city life, depicting a variety of characters and their relationships. Bernard Shaw's play, *Arms and the Man* presents to students an interesting and innovative approach to the theme of love and war, being set against the backdrop of the Serb-Russian war.

Thomas Hardy's novel, set in late 19th century England, and written in highly evocative prose, offers students a deep insight into the accidents and coincidences of life which lead to great emotional upheavals.

Semester 3 A. Core Course ENGA CC 5: American Literature (6 credits per week)

CO 1: This course exposes the students to American literary, cultural and political history through a wide-ranging selection of texts from drama, novel, and poetry by the great masters like Whitman, Miller, Faulkner, Fitzgerald, Poe, Hemingway, to iconic authors like Plath.

CO 2: The students' takeaway from this course is a sense of race, class and gender in the American social and cultural milieu. This course is an exposition of the American thinking mind and their ways of life.

ENGA CC 6: Popular Literature (6 credits per week)

CO 1: A course with text-selection based on popular literature of post independence voices in South Asian writings as well as American and European popular Culture including comic books, this course is an exercise in delight and instruction. With Herge's *Tintin*, Sukumar Ray's nonsense verse in *Abol Tabol* and Lewis Carroll's text the students learn the basics of theory and practice in children's literature that gives them a renewed insight on popular literature as opposed to classical canonical literature

ENGA CC 7: British Poetry and Drama (17th-18th Century) (6 credits per week)

CO 1: With a selection of iconic texts like John Milton's *Paradise Lost*, Alexander Pope's *The Rape of the Lock*, as well as texts like John Webster's *The Duchess of Malfi* & Aphra Behn's *The Rover*, this course introduces the student to an area of British Literature that is very significant with respect to the development of English literature in the later phases of Renaissance, the period of decadence afterwards as well as the trend of Satire in the Eighteenth century.

CO 2: The students get a vast sense of history and how political and social conditions → during particular periods in English literature have given rise to certain genres of literature.

B. Skill Enhancement Course SEC A2: Business Communication (2 Credits)

CO 1: Called a skill enhancement course, this course in business communication is aimed at teaching students the basics of language skill as in writing reports, letters, e-mails, curriculum vitae, minutes of meetings etc. It teaches them to express themselves succinctly and well in practical fields outside of the language of literature.

C. Generic Elective GE 3: Women's Writing and Women's Empowerment (6 credits per week)

CO 1: With authors as diverse as British poet Elizabeth Barrett Browning, Christina Rossetti, American poet Emily Dickinson, Indian poets and prose writers Sarojini Naidu, Rassundari Devi and Rokeya Sakhawat Hussain this gender based course introduces the students of other disciplines to a slice of English prose and poetry by women of various origins. It empowers them with the history of women's struggles in societies of different times and teaches them resilience as well as the need to rise up for their own sake in the face of discrimination in society.

Semester 4 A. Core Course ENGA CC 8: 18th century British Literature

CO 1: With the advancement in print culture, literature of the 18th century developed greatly. The course familiarizes students with the history and literature of the period. From Samuel Johnson and Joseph Addison to Daniel Defoe, this course introduces students to various forms of writing during the eighteenth century, especially the novel that gained mass popularity and attention.

ENGA CC 9: Romantic Literature

CO 1: Romanticism had a profound influence on European culture and enabled a modern understanding of the self, nature, reason, freedom, and the role of the artist. Emphasis is placed on the philosophical and theoretical concepts that inform Romantic poetry, as well as on the broad scope of literary forms through which the Romantic poetic imagination expressed itself. The course would help students situate authors like Blake and Wordsworth in their historical and social contexts to better understand their texts. Romantic fiction by Mary Shelley and non fiction by Charles Lamb provide a comprehensive understanding of the age across diverse genres.

ENGA CC 10: 19th century British Literature

CO 1: The nineteenth century witnessed extraordinary social and cultural change in Britain, from the rise of industrial capitalism to the emancipation of women, from the decline of Christian belief to the growth of the Empire, from urbanisation to the emergence of mass literacy. This course will introduce students to some significant texts and literary movements of the period, in the wider context of social transformation and emerging literary practices.

CO 2: Students shall be introduced to the establishment of the novel as the dominant literary genre, the ways in which social values are encoded and contested in literary texts, and the relationship of traditional and experimental practices in poetic forms. The course aims to develop students' analytic and critical skills through a close reading of poets like Tennyson & Browning and novelists like Jane Austen and Charles Dickens.

B. Skill Enhancement Course SECB2: Academic Writing and Composition (2 credits) This course helps students develop their reading, analysis, and writing skills to develop complex written arguments based on careful evaluation and synthesis of information from research. Integration of ideas and applying proper citation is also a significant outcome of this course.

C. Generic Elective GE 4: Academic Writing (6 credits per week) CO 1: This course helps students develop their reading, analysis, and writing skills to develop complex written arguments based on careful evaluation and synthesis of information from research. Integration of ideas and applying proper citation is also a significant outcome of this course.

Semester 5 A. Core Course ENGA CC 11: Women's Writing (6 credits per week)

CO 1: This course offers an eclectic selection of women's writings ranging from the foundational feminist text Wollstonecraft's *A Vindication of the Rights of Woman* to poems, novels, short stories and memoirs. The articulation of women's voices in different times and spaces is amply represented by the poems of Emily Dickinson, Elizabeth Barrett Browning and Eunice de Souza, Alice Walker's *Color Purple*, Mahasweta Devi's short story "Draupadi", Katherine Mansfield's "Bliss" and Rassundari Devi's *Amar Jiban*. Apart from highlighting the many facets and discourses around women's problems and rights, the course also aims at gender sensitization and fostering social awareness among the students.

ENGA CC 12: Modern British Literature (6 credits per week)

CO 1: The students are introduced to glimpses of the incredibly complex cultural phenomenon called modernism in British literature. The poems of T. S. Eliot, W. B. Yeats and Wilfred Owen have been included in this course to represent the major trends in this paradigm shift. The unfathomable recesses of the human mind can be probed in the novels of Joseph Conrad and D. H. Lawrence. In keeping with the changing times, new experiments in theatre became necessary to imagine the world from a new perspective, as indicated by George Bernard Shaw's drama.

B. Discipline Specific Electives ENGA DSE A-1: Indian Literature in Translation (6 credits per week)

CO 1: This course adds a new dimension to the English Honours programme in being a study of contemporary Indian literature in English translation. As a selection from texts written in various Indian languages like Hindi, Bengali, Odia, Panjabi and Urdu, this course offers a mixed bag of diverse cultural experiences, while at the same time making the students aware of the practice of translation as mediation and interpretation. The students will get the chance to read authors such as Rabindranath Tagore, Ismat Chughtai, Fakir Mohan Senapati, Prem Chand, Vijay Tendulkar, G. M. Muktibodh and Amrita Pritam.

ENGA DSE B-1: Literary Types (6 credits per week)

CO 1: This course is a study in theories of literature and literary devices of language. Students are expected to develop an in-depth knowledge regarding the three literary types, i.e. tragedy, comedy and short story. Apart from this, they will also learn the rhetorical devices used in English language, along with the prosodic patterns used in poetry. A major outcome of this course is the development of skills of scansion.

Semester – 6 A. Core Course ENGA CC 13: Modern European Drama (6 credits per week)

CO 1: The plays selected for this course informs the students of the dramatic changes that took place in twentieth century European drama. The course looks at the ways in which traditional norms and conventional modes of thought were resisted and subverted by playwrights who wanted their plays to reflect the chaotic climate of the modern era.

CO 2: We will also endeavor to read the plays as being representative products of their milieu by juxtaposing these against their political and socio-cultural contexts. Henrik Ibsen, Bertolt Brecht and Samuel Beckett engage with three very different themes and stylistic innovations in their plays. The course is thus quite engaging and thought provoking, introducing students to concepts like absurdism and the alienation effect.

ENGA CC 14: Postcolonial Literature (6 credits per week)

CO 1: In this course, students will read texts from previously colonized spaces like India, Australia and Latin America. Possess a coherent knowledge and a critical understanding of postcolonial literature and its key historical, cultural and theoretical developments.

CO 2: Post completion of the course, students should be able to compare, discuss and explain interconnections and functions of postcolonial literature and its contexts, including comparative and interdisciplinary issues. They will be able to critically evaluate arguments and assumptions about postcolonial literature, texts, and modes of interpretation.

B. Discipline Specific Electives ENGA DSE A-3: Partition Literature (6 credits per week)

CO 1: Post-Independence, Partition literature occupies an important place in Indian literature. Translations of the works of writers who experienced the trauma of partition in Bengal, include 'The Marooned' by Protiva Basu, 'The Final Solution' by Manik Bandopadhyay, 'After Death: Twenty Years' by Birendra Chattopadhyay, 'Rehabilitation' by Sankho Ghosh. Amitava Ghosh's novel in English, *The Shadow Lines* is another poignant account of the reality of partition and its wideranging effects. The pain of partition experienced in Punjab and northern India is best brought out in Sadat Hasan Manto's story, 'Toba Tek Singh', which is relevant even today. Sahir Ludhianvi's, 'Twenty-sixth January' still evokes poignant emotions associated with partition.

CO 2: This course is particularly significant as it helps students to understand and locate Indian literature in a very painful chapter of their national history and the struggles of an earlier generation towards rebuilding their lives.

DSE B-3: Autobiography (6 credits per week)

CO 1: This elective course introduces students to a lesser known genre of literary studies. With texts as diverse as Tagore's *Reminiscences* and Binodini Dasi's *My Life and My Life as an Actress*, students will be able to recognize the structure of autobiography as a distinct form of literature. They should be able to identify how an author's own ideology shapes reality in an autobiography, including how it raises questions about truth, factuality, objectivity, and subjectivity.

CO 2: Students will be encouraged to connect these autobiographical texts to their historical and cultural contexts and critically comment on the role of memory in the scripting of an autobiography.

Programme Outcomes of the English Honours Course

PO1. Critical Thinking: The undergraduate students will be able to process information, discern patterns, identify problems and provide solutions

PO2. Effective Communication: The capability of expressing their ideas clearly and respond appropriately to the communications of others in speech and writing would be one of the key outcomes of this course.

PO3. Social Interaction: The students will interact effectively with peers, faculty and management and effectively develop themselves in holistic cognizance of their surroundings and appreciate aesthetics in everyday life.

PO4. Effective Citizenship: The students will be able to exercise their rights correctly, and carry out their duties as responsible citizens of their country

PO5. Ethics: The students will be able to discern the moral conundrums that are present in everyday life and be able to identify the right path based on the value system inculcated in them by the institution

PO6. Environment and Sustainability: The capability of making sensible choices based on their knowledge of the environment and the factors that threaten it, is a critical outcome from this course.

PO7. Self-directed and Lifelong Learning: The course will facilitate access to sources of information and students will be able to process information on a need to use basis, and constantly upgrade their knowledge and skills.

Programme Outcomes of the Elective Course in English

PO1. Critical Thinking: Empowerment of students to exercise their ability to think clearly and cogently.

PO2. Cultural Integration: Enabling students to be aware of the importance of the coexistence of different cultural perspectives and be tolerant to views different from their own.

PO3. Writing: Students will have an enhanced capability of developing an argument in writing, state facts clearly and cogently and recognize and use the formats of different forms of writing like letters and essays.

PO4. Social Interaction: Enablement to respond appropriately in discussion, interrupt politely, state

their views clearly and accept differences in opinion amicably

PO5. Ethics: Students capability to use their sources with proper acknowledgement, and shun plagiarism

PO6. Self-directed and Lifelong Learning: Students' capability to access information and knowledge independently

Programme Outcomes of the Compulsory and Elective English

At the time of passing out from this course, students will be able to

PO1: Cultural Interaction: read and comprehend matter written in English

PO2: Writing: write letters in the correct format

PO3: Social Interaction: formulate appropriate curriculum vitae

PO4: Self-directed and life-long learning: express themselves in speech and writing.

Bengali

Programme Specific Outcome

1. Grasp the complexity of language as a communication system shaped by cognitive, biological, cultural, and social factors.
2. Demonstrate understanding of the concepts, theories, and methodologies used by linguists in qualitative and quantitative analyses of linguistic structure, and patterns of language use.
3. Demonstrate understanding of processes of language change and variation, the role of language in reflecting and constructing social identities, and the distinctive properties of human language.
4. Are able to collect, organize and analyze linguistic data from diverse languages, to form hypotheses about language structure/use and to test those hypotheses against new data.
5. Acquire the technical vocabulary and theoretical tools of the field, necessary to read published linguistic research.
6. Can synthesize research findings and construct a readable, well supported research report.
7. Are ready for significant scholarly participation in the field of linguistics.
8. Studying Bengali Literature can raise students' awareness of aspects of Bengali culture
9. It enables students to understand that culture is a broad concept that can mean different things to different people.
10. Students can understand and respond to ideas, viewpoints, themes and purposes in texts.

11. They can relate texts to the social, historical and cultural contexts in which they were written and can analyse how writers' use of linguistic and literary features shapes and influences meaning writers' use of organisation, structure, layout and presentation.
12. They also can generate ideas, planning and drafting.
13. They are able to use and adapt the conventions and forms of texts on paper and on screen.
14. Students can vary sentences and punctuation for clarity and effect.
15. Studying Literature helps the students to improve vocabulary for precision and impact.
16. It also helps the students to develop varied linguistic and literary techniques. Students learn structuring, organising and presenting texts in a variety of forms on paper and on screen.
17. The course of Literature helps them to develop and use editing and proofreading skills on paper and on screen.
18. Help them Commenting on language use and also locating and extracting information.

Course Outcome

Paper I and II

- The course provides a brief introduction to the history of Bengali language. The beginning of writing system in Bengali within the emergence of writing culture in India is addressed to start with. The followed by a discussion on the language family of the Indian sub-continent and *IndoAryan* family of languages to which Bengali belongs to. The subsequent three parts deal with Old Bengali, Middle Bengali & Modern Bengali phases of the language. Rather than discussing the features only, we plan to introduce some texts of the said periods (i.e :Chorjapod, Srikrishnokirton, Mongolkabya)

Paper III and IV

- The spoken language is very different in various geographical locations. Also there are dissimilarities in various social groups within a language – community. We tend to present before the students various dialects spoken in various parts of Bengal and surrounding areas. Also we will discuss different language styles in various social groups in this course.
- Cultural Behavior of the language community Here the students will get to know the behavior of this cultural community called *Bengali*. Both the historical and descriptive approach will be taken into account.

Paper V

- Bengali has a rich oral tradition from the olden days. Objective of this paper is to focus upon various oral traditions like Folktales, Folklore/Songs and Myths and proverbs of Bengali and to make the students familiar to that abundance of beliefs and practices which had been a source of energy for our everyday life and had been passed down from earlier generations to us.
- To enhance students' knowledge to words Bengali culture, folk elements are most important component. In this paper, students will be acquainted with some of the performing arts of Bengal.

- This paper will survey the literary History from modern period to contemporary. Trends in these periods are to be discussed.(i.e:Modern Novel and short stories, Essay literature etc)

Paper VI

- Rabindranath Tagore is the first recipient of Nobel prize in Literature in the Asia continent. So, we tend to introduce some of his literary works in this paper.

Paper VII

- A Text of collected Essays by important Authors to be studied in this course. There will be ten essays to be studied in the whole semester/Courses

Paper VIII

- This paper will highlight the cultural background and history of Bengali Culture ,and history of Sanskrit, and English Literature also .

- **HINDI**

- **Program Specific Outcomes**

- PSO1. Understand the gradual progress of language and its literature with orientations and changes occurred during the flow of time and history.
- PSO2. Analyse the relationship among language, literature and society.
- PSO3. Understand the behavioral approach of human beings.
- PSO4. Perform more scientifically for the betterment of mankind by learning functional hindi and basics of journalism.

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- **Course Outcomes**

- CO1. Describe the history of hindi literature with evolution of language.
- CO2. Write down the characteristics of ancient and medieval literature in context of different socio-economic environments.
- CO3. Identify the modern literary reactions towards the changes of society.
- CO4. Write down the characteristics of official language of India and its implementation in society.

SANSKRIT

After successful completion of B.A. Honours in Sanskrit

PSO 1. Students will learn Sanskrit Language and communication skills in Sanskrit very efficiently. By learning a new language they will be able to compare its characteristics, grammatical foundation, enriched vocabulary etc. with other Indian languages especially with those who belong to OIA family of languages.

PSO 2. Through the Sanskrit language students will get connected to the ancient heritage of Indian subcontinent, its glorious culture and diversity, its history and its journey from past to present. The actual India with its splendid culture will be in front of the students devoid of any external misinterpretation

because the students will be able to access the primary sources and will not depend on the secondary sources like translation or exposition in other languages.

- PSO 3. Students will learn to read the ancient manuscripts and will get initial knowledge about Inscriptions, different ancient scripts and some other languages derived from Sanskrit like Pāli and Prākṛta etc. which will lead them to learn Ancient Indian History in a very authentic way. Students will be ready to serve in different projects related to Manuscripts and archives.
- PSO 4. Students will know the base and basic ideas of Indian society and social Institutions and Indian Polity as well. Being aware about the evolution of Indian society with all its details they will be critical to the social rules and regulations and therefore they will be awakened citizens and will help to make a better Indian society. They will be able to bring forth the liberal ideas from Ancient Indian texts and to propound harmony in different aspects of society.
- PSO 5. Students will enjoy Ancient and Modern Sanskrit literature and will be well-versed in Indian Poetics. Students will acquire good writing skill and will learn the art of articulating different aspects and emotions of life following the literary creation of great poets (*kavi*) of all time like Kālidāsa, Bāṇa, Māgha and others.
- PSO 6. The syllabus gives the students a great chance to literate themselves in computer and computational Sanskrit simultaneously. Students will learn digitizing of texts, data typing and printing, different software and machines (searching, translating, analyzing etc.) related to Sanskrit. They will get a chance to get employed in few of trending fields of ICT as well.
- PSO 7. Students will be well aware about the trending ideas of Indology in both East and West, which will provide them the chance to choose future streams of research in both India and abroad. Because of the revolution in Information and technology field students will get the chance to stay in touch with the learned researchers and their research works and with the renowned institutions as well.
- PSO 8. Students will get introduced to Indian Philosophical schools and will read a few texts on it. They will also know the differences and characteristics of Schools of Indian Poetics as well. After the completion of the course they will know their field of interest which will help them to choose future specializations in academic venture. Students will learn the Pāṇinian system of Sanskrit Grammar and will know the structure of any language very well and will be efficient enough to learn other languages than students of other streams.
- PSO 9. Students will read the texts like Ramayana and Mahabharata which simultaneously will grow their interest in Indian Culture and literature and will develop their personality. Bhagavad Gīta, Nītiśataka and other nīti texts will help them to lead a healthy and balanced life which is the need of the hour.
- PSO 10. Students will find themselves employable in academic fields, language teaching posts, administration through competitive examinations, different manuscript, translation and in other projects and also make them ready for further studies and research works in specific fields.

Course Outcome

- CO 1. Core Courses of the Under Graduate Syllabus cover a wide range of subjects of Indology through Sanskrit Language and therefore provide a good opportunity to students to acquire diversified knowledge about Indian's rich ancient knowledge tradition encompassing literature, poetics, dramaturgy, ancient science, philosophy, grammar, smṛti (Social Institutions and Polity), Epigraphy and Paleography, mythology etc. Students will get introduced in all these fields and will read a few texts related to each field in a very scientific way.
- CO 2. Through the Skill Enhancement courses (SEC) students acquire practical knowledge about Sanskrit language and its applicability in day to day life and in Information and Communication Technology as well.

Students become well equipped both in theoretical and practical aspects of Sanskrit Language and the texts related to the language. These courses enhance the writing and conversation skills of the students to make them free from being dependent from secondary sources.

- CO 3. Discipline Specific Courses (DSE) allow the students to dive deep into the theoretical parts of different fields of Indology like Philosophy, Poetics, Ancient and Modern Literature etc. These courses gradually improve the critical thought of the students and they will be expert in explanation and analysis of the ancient texts and will find applicability of them in current context.
- CO 4. Students will read Vedic, classical and modern Sanskrit literature and therefore will get the chance to critically perceive the evolution pattern being guided by the research works done by great scholars of East and West for a long time. Students will read the literary creations of the renowned poets of all time like Kālidāsa, Bāṇa etc. and will be able to appreciate them and compare their works with others of past and present.
- CO 5. Students will learn the Indian Social Institutions and Indian Polity from the Mahābhārata, Rāmayaṇa, Arthaśāstra, Manusamhitā etc. They will learn the ideas of people like MK Gandhi, Aurobindo, Vivekananda and other modern thinkers regarding them as well.
- CO 6. Students will learn the discussions on Indian Dramaturgy which is very enriched and ahead of time. The lessons on the schools of Indian Poetics will grow a critical approach in the students while discussing and analyzing any literature form.
- CO 7. Students will get introduced to the Indian Philosophical Schools both the Orthodox and non Orthodox and will read a few canonical texts related to the schools.
- CO 8. The courses on Paleography and Epigraphy will educate the students in Ancient Manuscripts, Inscriptions and Scripts which will create an expertise in discussion of Ancient Indian History.
- CO 9. Students will learn Pāṇinian Grammar following the authentic primary texts which will allow them to analyze the structure of Vedic and Classical Sanskrit Language. This structure will help a lot while creating translating software or while decoding the structure of any language.
- CO 10. Students will learn a lot about Indian approach on ethics, yoga, science and other practical aspects following the ancient texts. Self management in Gīta is a very important addition to the syllabus which will teach the students to manage the balance in their personal life and lead to a very creative and fruitful social life simultaneously.

Course Outcomes (1+1+1 System)

Paper I:

1. Basic introduction to Sanskrit syntax, Morphological generation, and Semantics.
2. Textual analysis of Sanskrit prose literature and different composing styles (i.e. Kādambarī and Daśakumāracarita)
3. Textual and literary criticism of Kālidāsa's Abhijñānaśakuntala (act 1-3)
4. Basic introduction to Sanskrit Poetics with the help of Kāvyaḷaṅkārasūtravṛtti

Paper II:

1. Study of Sanskrit Metres (i.e. Chandomañjarī)
2. Textual and literary analysis of drama from pre-kālidāsa era (i.e. Svapnavāsavadatta)
3. Textual and literary criticism of Kālidāsa's Abhijñānaśakuntala (act 4-7)

4. Textual and literary analysis of Mahākāvya from post-kālidāsa era (i.e. Kirātārjunīya)

Paper III:

1. General Introduction of Indian Poetology(Poetological Text in Sanskrit: Sāhityadarpaṇa of Viśvanātha-Kavirāja; chapter 6-10)
2. Introduction and basics of Vedic, scientific and Technical Sanskrit Literature

Paper IV:

1. Essay in Sanskrit; on topics of Indic culture, idols, ideals, social values, current sensibility and the like.
2. Post-Kālidāsa Sanskrit Mahākāvya: Bhaṭṭikāvya (or Rāvaṇavadha) of Bhaṭṭi (Canto 2)
3. History of classical Sanskrit Literature including Inscriptional and Historical Works

Paper V:

1. Vedic texts and Vedic grammar (Vedic texts: Hymns of Ṛgveda — 1.1. Agnisūkta, 10.121. Hiranyagarbhasūkta, 10.125. Devīsūkta, 10.34. Akṣasūkta, 10.191. Saṃjñānasūkta)
2. Vedic Grammar: Padapāṭha and general outline of Vedic grammar.
3. Vedic texts; Yajurveda; Atharvaveda and Brāhmaṇa, Upaniṣad (Rudrādhyāya (Śukla-Yajurveda, 16.1-14), Atharvaveda (12.1.1-10), Maumatsyakathā (śatapathabrahmaṇam), śunaḥśepopakhyānam (Aitareyabrāhmaṇam, 3.3.3), Bṛhadāraṇyakopaniṣad (4.4. and 4.5.)

Paper VI:

1. Texts on Dharmasāstra and Arthasāstra
 - a) Basic introduction to ancient Indian legal system
 - b) Comparison with Modern Indian legal system (specially with Indian Penal Code) (Yājñavalkya-saṃhitā - Chapter 2 Vyavahārādhyāya)
 - c) Different perspectives on ancient Indian polity (i.e. rājadharmaprakaraṇā of Manu and arthasāstra of kauṭilya)
 - d) History of Indian Dharmasāstra, Arthasāstra and Nītiśāstra

Paper VII:

1. Sanskrit Grammatical text : Siddhāntakaumudī of Bhaṭṭojidīkṣita.
2. General Acquaintance with Phonetic Tendencies (The following topics — Assimilation, dissimilation, epenthesis, prosthesis, metathesis, anaptyxis, haplology, syncope, apocope, aphaeresis, cerebralisation, analogy).
3. Siddhāntakaumudī of Bhaṭṭojidīkṣita — Samāsaprakaraṇa; excluding Samāsāntavidhāna
4. Elementary knowledge about 'Science of Language', the IE family of language and the phonetic laws, history of the concept of IE language, divisions of IE. (Among phonetic laws the following are important — Grimm's law, Verner's law, Grassmann's law, Bartholomae's law, Collitz's law, Fortunatov's law)

Paper VIII:

1. General Acquaintance with the Indian philosophical systems.
2. Elementary knowledge about the subject of Annambhaṭṭa's Tarkasaṃgraha.

HISTORY

Programme specific Outcome

After completing History Honours Undergraduate Course

1. Students shall be able to demonstrate thinking skills by analyzing, synthesizing, and evaluating historical information from multiple sources.
2. Students will develop the ability to distinguish between fact and fiction while understanding that there is no one historical truth.
3. Students will produce well researched written work that engages with both primary sources and the secondary literature.
4. Students will develop an informed familiarity with multiple cultures.
5. Students will employ a full range of techniques and methods used to gain historical knowledge.
6. Students will develop an ability to convey verbally their historical knowledge.
7. Students will demonstrate their understanding of cause and effect along with their knowledge of the general chronology of human experience.

Course Outcomes

1. Study of Historiography helps in constructing original historical arguments based on primary source material research along with the development of the ability to convey verbally thesis research and relevant historiography and theory.
2. The Study of Early World History and Cultures proposes the idea that humankind as a whole has a history to be investigated and that a world history course may be more than study of various “cultures,” each disconnected from the others. It encourages to think explicitly about the aims of world history education and about the knowledge and understandings It is conceived on the premise that students will achieve will greater competence in world history and more successfully meet content and performance standards, if they are guided to relate particular subject matter to larger patterns of historical meaning and significance.
3. Students will acquire a sophisticated awareness of the relationships that develop through time between political, social, economic, cultural, intellectual, and religious factors, weaving into “patterns” and trends.
4. Students will learn the methods and techniques of research and analysis in the discipline of history, including the “social sciences” and “humanities” traditions as well as the “rules of evidence” employed in historical thinking and writing – all components of “critical thinking.”
5. Students will acquire a rudimentary sense of historiography – historical argumentation and debate – on key questions of professional research.
6. Students will develop communications skills to express historical perspectives, including writing and oral presentations of expression.

PHILOSOPHY

With a well-balanced proportion of diverse concerns of contemporary philosophy and cultivating synchronization between tradition and modern thought we encourage our students to become dedicated, responsible and help them build career in the world of academics, bureaucracy and mass communication. The department is proud to be associated with excellent students and faculty members. Our graduate program produces students with comprehensive knowledge in different branches of the subject.

Program specific Outcomes:

After successfully completing B.A. in Philosophy:

1. Students will be able to explain philosophical texts and positions accurately, to identify and apply philosophical research methods consistently, to articulate and defend precise philosophical positions.
2. Students will be able to apply their philosophical learning to important public issues and to articulate why philosophical understanding is valuable in such debates.
3. Students will develop their own philosophical areas of interest and investigate them from various perspectives.
4. Students will attain the research skills necessary for writing a research paper that engages with primary and, where applicable, secondary literature on a topic in philosophy.
5. Students will be able to describe the ways in which the formal techniques of logic are important to philosophical research.
6. Students will acquire reading skills necessary to understand and critically engage with historical and contemporary philosophical texts.
7. Students will be aware of the existence of multiple philosophical traditions, and will be able to reflect on the cultural specificity of some of their own concepts and values.
8. Students will be able to explain epistemological concepts such as the nature of knowledge, justification, evidence and skepticism, and to summarize and evaluate major philosophical positions in relation to each.

Course outcomes: (CBCS System)

Indian Philosophy: CC1, CC3, CC11, CC13

1. Students will read and critically assess the work of central thinkers in the history of Indian philosophy.
2. Students will explore and understand the historical development of major Indian philosophical ideas.
3. Students will develop a critical understanding of various key concepts in philosophy such as 'prama', 'pramana', 'prameya', 'manas', 'jiva', 'jagat', 'ishwara', 'karma', 'janmantara', and 'vedic authority'.

Western Philosophy: CC2, CC4, DSE-David Hume, SEC B1

1. Students will read and critically assess the work of central thinkers in the history of western philosophy.
2. Students will explore and understand the historical development of major western philosophical ideas.
3. Students will develop a critical understanding of various key concepts in philosophy such as 'substance', 'God', 'scepticism', 'mind-body problems', 'man and the god relation' and 'Universal'.

Western Metaphysics: CC10, DSE Analytic Philosophy

1. Students will read and critically assess the work of central thinkers in the history of western metaphysics.
2. Students will explore and understand the historical development of major western metaphysical ideas.
3. Students will develop a critical understanding of various key concepts in philosophy such as 'reality', 'mind', 'causal theory', 'evolution theory', and different views on metaphysical thought of the philosophers.

Ethics: CC12, CC14

1. Students will learn to identify and evaluate ethical principles, values and traditions of moral reasoning.
2. Students will learn to identify and evaluate critically the ethical foundations of key social institutions and professions with a view toward social justice.
3. Students will be able to explain and discriminate between major approaches to moral philosophy such as consequentialism, deontology and virtue ethics, and to summarize and evaluate the views of at least one philosopher associated with each.

Logic: CC8, CC9, SEC A1

1. A solid understanding of the basic concepts of logic, and in particular what it means for an argument to be valid, and the related notion of what it means for a set of statements to be consistent.
2. The ability to apply formal techniques and systematically codify deductively valid arguments.
3. The ability to translate natural language sentences into precise symbolic form and rigorously evaluate standard inferences.
4. Acquire a firm foundation for the study of other disciplines where logic plays an important role (mathematics, computer science, formal semantics in linguistics).
5. Generic analytical and critical thinking skills, including: the ability to identify the argument in a piece of prose and analyse its logical structure.

Psychology: CC5

1. Application of knowledge with critical thinking skills: Students should be able to use critical thinking to evaluate and interpret evidence, and to apply psychological concepts, theories, and research findings to individual, social, and cultural issues.
2. Study of Psychology will help students to understand themselves and others better and to solve, to a great extent, their own problems. Mutual understanding and respect will produce a society where peace and harmony will prevail.

Social and Political Philosophy: CC6

1. Students will be able to explain philosophical texts and positions accurately, to identify and apply philosophical research methods consistently, to articulate and defend precise philosophical positions, and to anticipate and rebut objections to those positions.
2. Students will be able to apply their philosophical learning to important public issues and to articulate why philosophical understanding is valuable in such debates.
3. Students will develop their own philosophical areas of interest and investigate them from various perspectives.
4. Students will attain the research skills necessary for writing a research paper that engages with primary and, where applicable, secondary literature on a topic in philosophy.
5. Students will acquire reading skills necessary to understand and critically engage with historical and contemporary philosophical texts.
6. Students will be aware of the existence of multiple philosophical traditions, and will be able to reflect on the cultural specificity of some of their own concepts and values.
7. Students will be able to explain and discriminate between major approaches to political philosophy such as Libertarianism, Marxism, Liberalism and Communitarianism, and to summarize and evaluate the views of at least one philosopher associated with each.

Philosophy of Religion: CC7

1. Students will be able to read complex texts from a variety of traditions

2. Students will understand and be able to apply the methodological tools used in the study of religion including textual analysis, sociology of religion, anthropology of religion and comparative religions
3. Students will understand the basic features of Western, Eastern and indigenous religious traditions, be able to recognize the foundations of traditions and be able to compare them.

3 Year Degree Course (1+1+1) system

Course outcomes:

1. Study of Ethics or Moral Philosophy will produce morally upright individuals who are socially concerned and sensitive to moral issues.
2. Study of Psychology will help students to understand themselves and others better and to solve, to a great extent, their own problems. Mutual understanding and respect will produce a society where peace and harmony will prevail.
3. Study of Western and Indian Philosophy will help students to develop their own Philosophy of life and to think critically.
4. Study of Logic enables clear thought through a rigorous demand for truthfulness. The relevance of Logic to everyday life is that its use improves the likelihood of satisfactory outcomes in the day-to-day decisions each person makes.
5. Study of Sociology has a great value especially in modern complex society. Sociology has great practical importance in the sense that it keeps us up to date on modern social situations and development.

POLITICAL SCIENCE

Program Specific Outcomes

1. This course in B.A. in Political Science enables the students to develop an overall understanding on political institutions, society, culture, politics and international relations. More specifically, it shall enable the students to evolve a critical understanding on Indian Politics and its nature and contemporary trends.
2. The exposure to Political Science also encourages them to develop a scientific outlook on above-stated subjects, as it emphasizes the role of empirical methods and theories in building up the knowledge over discipline.
3. It not only introduces the students to the structural and functional dimensions of political institutions but also a range of theories which equips them with a critical understanding on society and politics. For example, after studying the degree programme, the students shall be capable of providing political analysis on political parties, party system, and models of democracy.
4. The contemporary topics as included in the syllabus shall generate interest for research among the students in future.

Course Outcome

1. This program on Political theory aims to introduce certain key aspects of conceptual analysis in political theory and the skills required to engage in debates surrounding the application of the concepts. In today's

inter-disciplinary world, this program equips students to take on in-depth analysis of concepts like rights, equality, justice, freedom which are emerging as ever-pertinent questions.

2. The program on International Relations will provide students with great insights on political affairs, public policies, economic trends, social issues, law and many more. As an international relations specialist a student will have a broad set of career options in addition to politics, including in fields like economics, social systems and the cultural life of communities. Students can either opt for higher education such as master's degree or prepare for various competitive examinations such as UPSC and other state governments. They can also act as a link between the country you represent and the country where they are stationed; collect and report on all the information that would affect nation's interests.
3. The program on Public Administration is a system through which the government carries out its business of ruling and controlling effectively. Public Administrators may choose careers in the government sector. It will prepare the students to work in many governmental and other management careers, including health care administration, human resources management and even city management. Students can either opt for higher education such as master's degree or prepare for various competitive examinations such as UPSC and other state governments.
4. The program on Comparative Government and Politics will enable the students to have the access to a broad range of career options and job opportunities. They can apply their knowledge and critical thinking skills in political analysis as well as public policy analysis. The students can find the jobs in various non-profit organizations, in the scientific and academic fields. The typical employers are: government, nonprofit organizations, research institutes or think-tanks, private companies including foreign corporations, educational institutions.
5. The program Indian Government and Politics enables the students to hone their skills in analysing the current political events in the country. It trains them to take up news analysis and journalism as possible career prospects. It also allows them to take up a career in mass media - with mass communication and public relations.

BOTANY

Programme specific outcome

- Students develop a holistic knowledge in the undergraduate course starting from archegoniate group, Taxonomy of Angiosperm, Palaeobotany, Anatomy to advanced fields of plant science such as Cell and Molecular Biology, Plant protection, Plant metabolism.
- In practical classes students work out the specimens which help them to understand and to identify the specimens.
- The local and long field excursions help the students to develop knowledge about the local flora and flora of specific phytogeographic region in their natural habitat.
- Students build up awareness and knowledge in environmental related issues such as waste management, biodiversity conservation, pollution monitoring, etc.

- Students after passing post graduate course can explore in various field of research viz. Conservation of Ecosystem, Environmental Disaster Management, herbal drugs and medicinal plants, Host pathogen interaction, crop protection and plant disease management, GIS and remote sensing, Intellectual Property Rights, Quarantine etc.
- Students of UG course get the chance to have an exposure in skill enhancement courses such as Plant breeding, Mushroom culture and elective courses such as Industrial and environmental Biology, Medicinal and Ethno Botany etc . This will open up new avenues and job opportunities for the students .
- The students of Post Graduate Department get a hands on experience in Research during carrying out dissertation work. This helps the students to have research exposure which will be beneficial for those who will join the Ph.D. programme in future.
- The contents of core course and optional courses in PG curriculum are beneficial for the students to get prepared for NET/SET/GATE and also GRE and other competitive examinations.

Course specific outcome

Undergraduate

The undergraduate course in Botany under CBCS credit system has been semesterised in 2018. In each semester the **core courses** have theoretical and practical papers.

Sem I

In Sem I there are two core courses Phycology and Microbiology (CC1) and Mycology and Phytopathology (CCII). A brief account on classification, life history and economical importance of different algal and fungal genera are taught in these two papers which help the students to develop a clear concept on these two cryptogamic groups of plant kingdom. Besides, the practical classes the local field excursions enable the students to identify the fungal and algal genera. In Microbiology part the students develop a clear knowledge on different aspects of bacteria and virus. Students learn various culture techniques and bacterial staining method in practical class. In Phytopathology, students study about important plant diseases, host pathogen interaction and plant disease management. The study of Phytopathology is very much essential in the field of crop protection and disease management .

Sem II

In Sem II there are two core courses Plant Anatomy (CCIII) and Archaeogoniate (CC IV). The subject Plant Anatomy helps the students to know about Internal structural organisation of plant organs. The students also do practical to study the anatomical details of plant tissue and organs. In archaeogoniate paper the students study about Bryophyte, Pteridophyte and Gymnosperm groups of plant kingdom. In this semester students go for a long excursion in a place of higher altitude to observe and identify these groups of plants in their natural habitat.

Sem III

In Sem III there are three core courses. In Palaeobotany and Palynology (CC5) paper the students are taught about plant fossils, pollen structure and applied palynology viz. Forensic palynology, aeropalynology etc. In Reproductive Biology of Angiosperms (CC6) the students learn about morphology of angiosperm and embryology. Plant systematics paper (CC7) deals with the Taxonomy of Angiosperms. This is a very important field of Plant Science

which deals with Plant nomenclature, System of Classification and Taxonomic families. The students work out on angiosperm specimens in practical class and they also learn to identify plants. A number of local field excursions are in the curriculum during this semester. Students learn to prepare field note book, voucher specimen book and herbarium specimens.

Sem IV

In Sem IV students are offered three core courses. In Plant Geography paper (CC8) students study about plant evolution, plant ecology and plant evolution. Long excursion to a phytogeographic region in India is being carried out in this semester. This field trip helps the students to understand the characteristic flora of that particular phytogeographic region. In Economic Botany paper (CC9) students study about economically rich groups of plant crops viz. cereals, legumes, sugar and starches, spices, beverage, oil and fat, drug yielding plants etc. In Genetics paper (CC10) students get a clear concept on various topics of Genetics. In practical classes the students study about mitotic and meiotic chromosomes.

Sem V

In this semester two core courses are offered. In Cell and Molecular Biology paper (CC11) students come to know about origin and evolution of cells, DNA replication, transcription, translation, gene regulation and recombinant DNA technology. In Practical classes students carry out a number of experiments on Plant Molecular Biology. In Plant Biochemistry (CC12) paper students study about basic molecules of life, energy flow and enzymology and other biochemical processes of plant cell.

Sem VI

There are two core courses in this semester. In Plant Physiology (CC13) paper students acquire knowledge about various physiological processes viz. Photomorphogenesis, plant growth regulators, seed dormancy etc. In plant metabolism paper (CC14) students study about primary and secondary metabolic pathways such as photosynthesis, respiration, nitrogen and lipid metabolism etc.

Skill enhancement course and Discipline specific elective course :

In third and fourth semesters students have to take one skill enhancement course such as Plant Breeding, Mushroom Culture technique, Biofertiliser etc. In fifth and sixth semesters students have to opt for two Discipline specific elective courses in each semester such as Industrial and environmental Biology, Medicinal and Ethno Botany, Plant Biotechnology, Natural Resource Management etc. These special courses will open up new avenues for the students and they will be able to acquire knowledge in the applied fields of Plant Sciences.

Department of Physiology Honours (UG)

Programme specific outcome & Course specific outcome

1. Physiology is the science of life. It is the branch of biology that aims to understand the mechanisms of living things, from the basis of cell function at the ionic and molecular level to the integrated behaviour of the whole body and the influence of external environment.

2. We will cover the fundamental concepts of molecular, cellular, and systems physiology to understand how the human body functions and maintains homeostasis.
3. Although medical examples are used to illustrate general physiological principles, this is not a course in medical physiology. Still, the core of physiological knowledge that we cover should help the students better understand human health and disease.
4. Use basic chemical/biochemical, physical, and mathematical principles to describe the functioning of life processes associated with the topics in this course. (Cell physiology, neurophysiology, endocrinology, muscle physiology, cardiovascular physiology, respiratory physiology, renal physiology, immunology and reproductive physiology).
5. Demonstrate the use of the scientific method and quantitative reasoning in the field of physiology.
6. Students are able to integrate knowledge of the major systems to outline how these systems interact to maintain homeostasis.
7. Students are able to relate structure and function in physiology.
8. Students are also able to apply the physiological concepts presented to real world examples.
9. After getting a higher degree, they could join research and development and help human civilization.

Department of Anthropology

Programme Outcomes

PO no	Programme outcomes (Upon completion of B.Sc degree programme the graduate will be able to)
PO-1	Differentiate among three sub-disciplines of anthropology: biological, social-cultural, and archaeological anthropology
PO-2	Develop their writing skill in preparing a report
PO-3	Conduct a fieldwork by using different anthropological methods
PO-4	Develop their skills in laboratories about techniques used in advanced human genetics and anthropometric and craniometric studies
PO-5	Analyse data and conduct the studies by making a team
PO-6	Understand the importance of taking ethical approvals for conducting any sort of study
PO-7	Communicate easily with others through their gained knowledge
PO-8	Learn the advanced courses related to this discipline in future

Programme Specific Outcomes

PSO no	Programme specific outcomes (Upon completion of the courses offered in B.Sc Anthropology, the students would)
PSO-1	Have good understanding in three main aspects of anthropology: human evolution, variation and adaptation
PSO-2	Be expertise in training in fieldwork in anthropology
PSO-3	Be expertise in rapport establishment with the people during the fieldwork
PSO-4	Be motivated for further higher studies and research in different sub-disciplines of anthropology
PSO-5	Have gained the skill to think, analyse, write, and recreate through assignments and project work
PSO-6	Get the assistance in taking preparation for competitive examinations like WBCS, IAS, and UGC-NET, GATE

Course Outcomes

Semester/ Year	Course code/title	COURSE OUTCOMES
Semester I (Honours)	CC 1 (Introduction to biological anthropology)	<p>Knowledge gained: To understand the aim and scope of biological anthropology, biological basis of inheritance and human skeletal morphology</p> <p>Skill gained: To be expertise in human cranial and post-cranial bones identification</p>
	CC 2 (Introduction to social and cultural anthropology)	<p>Knowledge gained: To understand the aim and scope of social-cultural anthropology, elements of society and culture, kinship system, marriage, family</p>

		<p>structure, religion and social change</p> <p>Skill gained: To be expertise in writing a report on phenomenological study with the help of methods used in fieldwork in anthropology</p>
Semester I (General)	CC/GE 1	<p>Knowledge gained: To understand the aim and scope of biological, social-cultural and archaeological anthropology, biological basis of inheritance and human skeletal morphology, concepts of society and culture, religion and social change, knowledge gained in palaeoanthropology, archaeological field methods and tool typology and technology</p> <p>Skill gained: Hands on practice of human cranial and post-cranial bones identification and craniometric measures</p>
Semester II (Honours)	CC 3 (Introduction to archaeological anthropology)	<p>Knowledge gained: To understand the concepts of archaeology and prehistoric studies in anthropology, methods used in prehistoric archaeology</p> <p>Skill gained: To be expertise in identification of prehistoric tool types and technologies and raw materials used</p>
	CC 4 (Fundamentals of human origins and evolution)	<p>Knowledge gained: To understand the variations in living primates, fossil primates and evolutionary trends in primates, hominoids and hominids</p> <p>Skill gained: Hands on practice for identification of living hominoids, fossil hominoids and fossil hominids</p>
Semester II (General)	CC/ GE 2	<p>Knowledge gained: To understand the basic concepts of human genetics and population variation, study on racial classification, prehistoric culture in Africa and Europe, and typo-technological development in different prehistoric cultures, Basic concepts of marriage, family, kinship and some applied aspects of social-cultural anthropology</p> <p>Skill gained: Hands on practice of anthropometric measures and human genetics study</p>
Semester III (Honours)	CC 5 (Ecology and culture in the past)	<p>Knowledge gained: To understand the climatic fluctuations and cultures in Pleistocene time, further development of cultures in Holocene times and the earliest civilizations</p> <p>Skill gained: Hands on practice of morphometric analysis of prehistoric tools</p>
	CC 6 (Human ecology, biological	<p>Knowledge gained: To understand the concepts of human growth, nutrition, human ecology</p>

	basis of growth and nutrition)	Skill gained: To be expertise in taking craniometric and osteometric measurements
	CC 7 (Theories of culture and society)	Knowledge gained: To understand the theories of social-cultural anthropology Skill gained: To be expertise in writing a report on phenomenological study with the help of methods used in fieldwork in anthropology and qualitative analyses of data
	SEC A-1 (Public health and epidemiology)	Knowledge gained: To understand the principles of epidemiology in public health; psychological, behavioral and social issues in public health
Semester III (General)	CC/GE-3	Knowledge gained: To Understand the theories of evolution, evolutionary trends of living primates and fossil primates and modern humans; palaeolithic and microlithic cultures of India; political and regional anthropology of South Asia Skill gained: To be expertise in identification of prehistoric tool types and techniques; develop the skill in studying toposheets
Semester IV (Honours)	CC 8 (Human Genetics and Population Biology)	Knowledge gained: To understand the biological basis of inheritance, the concepts of chromosome, gene, DNA, RNA and chromosomal abnormalities; application of Mendelian principles in human genetics Skill gained: To be expertise in conducting some genetic tests like dermatoglyphic, ABO blood group
	CC 9 (Anthropology of India)	Knowledge gained: To understand the contribution of Indian scholars in biological, social-cultural, and archaeological anthropology Skill gained: To be expertise in writing a project report on any archaeological sites; and a report on any social issue in public sphere
	CC 10 (Study of human population)	Knowledge gained: To understand the concepts of population genetics, racial classification, and racism Skill gained: To be expertise in taking anthropometric measurements on living individuals
	SEC B-2 (Media and anthropology)	Knowledge gained: To understand the concepts of theory, paradigm and model of media approaches and themes
Semester IV (General)	CC/GE-4	Knowledge gained: To understand the concepts of forensic anthropology, genetic counselling, and biostatistics; Neolithic and Chalcolithic cultures of

		India; anthropology of religion and backward communities in India Skill gained: To be expertise in fieldwork training and writing of an ethnographic report
Semester V (Honours)	CC 11 (Anthropology in practice)	Knowledge gained: To understand the concept of forensic anthropology and genetic counselling; applied, action and public anthropology; concept of archaeology in practice Skill gained: To be expertise in writing a report on major govt policies and programs for rural people of West Bengal; hands on practice in studying topographical maps
	CC 12 (Research methods for practice 1)	Knowledge gained: To understand the theoretical concepts of research methods used in social-cultural anthropology and archaeology Skill gained: To be expertise in writing an ethnographic report by conducting a fieldwork in social-cultural anthropology
	DSE A-2 (Advanced human genetics)	Knowledge gained: To understand the concept of advanced human genetics like electrophoresis techniques, DNA sequencing, Genetic mapping etc. Skill gained: To be expertise in writing a project report on any topic in this paper
	DSE B-1 (Advanced Indian prehistory)	Knowledge gained: To understand the current trends of Indian Prehistory, various Indian prehistoric sites Skill gained: To be expertise in writing a project report on the topic present in this paper
Semester V (General)	DSE 1A (Human growth and development)	Knowledge gained: To understand the concept of human growth, development, and maturation; the concept of human nutrition Skill gained: To be expertise in writing a project report on any topic given in this paper
	SEC-A 2 (Physiological anthropology)	Knowledge gained: To understand the concepts of physiological anthropology with various terms
Semester VI (Honours)	CC 13 (Research methods for practice 2)	Knowledge gained: To understand the concepts of research design, hypothesis, qualitative and quantitative research, ethics, and the procedure to data analysis and writing of an article Skill gained: To be expertise in writing a project report on the social movements in India

	CC 14 (Research methods for practice 3)	<p>Knowledge gained: To understand how to write a review of a particular book mentioned in the syllabus</p> <p>Skill gained: To be expertise in data analyses and writing of an ethnographic report; a fieldwork on geomorphological study</p>
	DSE A-4 (Advanced forensic anthropology)	<p>Knowledge gained: To understand the use of forensic science in anthropology like dermatoglyphics, hair, skeletal remains</p> <p>Skill gained: To be expertise in studying finger and palm prints and their analyses</p>
	DSE B-4 (Advanced Indian Protohistory)	<p>Knowledge gained: To understand the emergence of civilization in the context of protohistory in India like Harappan civilization</p> <p>Skill gained: To be expertise in writing a project report on any topic present in this paper</p>
Semester VI (General)	DSE-3B (Heritage management)	<p>Knowledge gained: To understand the meaning of heritage, concepts of conservation, cultural heritage management and museum studies</p> <p>Skill gained: To be expertise in writing a project report on museum studies</p>
	SEC- B 2 (Earliest evidence of urbanization in India)	<p>Knowledge gained: To understand the emergence and development of Harappan civilization</p>

Department of ZOOLOGY General Course (UG)

Programme specific outcome & Course specific outcome

After successfully completing B.Sc. in Zoology:

1. The Zoological study will enable students to gain knowledge on the overall animal world their habit and habitat and the role in environment. This will inculcate them the importance of every surviving animal in the earth and necessity of their presence for the survival of the ecosystem.
2. The concept of Ecology will enable the students to have an idea about the various pollutions in the ecosystem that are disturbing the balance of the nature. The concept of sustainable development teaches the students to learn the optimum uses of the non-renewable resources of the earth and to apply methodologies for the use of renewable resources in the survival of the mankind.

3. The study of Molecular Biology, Biochemistry, Immunology, Parasitology, and Developmental Biology will help the students to gain knowledge in the life processes and will provide them scope in researches.
4. Biotechnology will provide impetus to the students to the use of various technologies in the field of biology. The use of animals in the welfare of human society like Apiculture, Sericulture, Poultry, Lac-culture, etc., Researches in this field will provide different job-oriented courses which will be beneficial to the students.
5. Field Excursion conducted is very much beneficial to the students. The visit to National Park or Sanctuary or Biosphere Reserve help the students to learn the various conservation strategies, both in-situ as well as ex-situ, for animals and plants. This forest study will help students to understand the importance of forests and their resources. This study provides them the idea about the status of different animals on the ecosystem and also the need of conservation of the threatened or endangered species.
6. The study of animal dissections will benefit the students to have an idea of the internal anatomy of the animal which will provide them a sound knowledge about the internal environment of the living animals.
7. The study harmful microbes help the students to know about the mode of infection of those pathogens. Moreover the control measures and the prophylactic measures will give a clear idea about how to manage the diseases and to design new medicines in combating the infections caused by harmful microbes.
8. Taxonomical studies enable the students to learn about the different variety and variability of the animal world. Taxonomy helps them to identify unknown specimens and also to group animals in a systematic way by way of phenotypic or genotypic or behavioural characteristics. This study is particularly important to the students in understanding the overall diversity.
9. The study of various ecosystems including marine, forest, aquatic, wetland etc., provide good idea to the students about the variety of ecosystems and their difference and interrelationships. The study also provide an idea about the floral and faunal communities of those ecosystems and give an idea about the native species of respective ecosystems.

Department of Geography General Course (UG)

Programme specific outcome & Course specific outcome

PO 1. To understand the scope and evolution of the diverse discipline of Geography.

PO 2. Recognize, synthesize and evaluate diverse sources of knowledge, arguments and approaches pertinent to exploring human-environment problems. Explain societal relevance of geographical knowledge and apply it to real world human- environment issues.

PO 3. and reflect critically on the importance of holistic and interpretative human- environment perspectives.

PO 4.An understanding and acknowledgment of the threats that endanger the earth's natural systems. This helps in further realization of the significance of anthropogenic causes of many of the disasters and threats that puts life on this planet on the edge.

PO 5.Development of knowledge, skills and holistic understanding of the discipline among students. Encouragement of scientific mode of thinking and scientific method of enquiry in students. This goal is achieved through the regular field excursions conducted by the Department to various parts of India extensively and the writing of a report/thesis on it.

PO 5 Students become equipped with the ability to respond to both natural and man-made disasters and acquire management skills. This is attained through the curriculum by studying and analyzing hazards, disasters, their impact and management.

PO 6. Ability to undertake research in interdisciplinary studies and problems or issues beyond the realm of what strictly comes under the purview of geography. This is possible because of the varied nature of the curriculum that encompasses the study and analyses of concepts of sub-disciplines and allied disciplines of Geology, Seismology, Pedology, Hydrology, Environmental Studies, Disaster Management, Resource Management and Conservation, Regional Planning and Development Studies etc.

COURSE OUTCOMES

The course specific outcomes of undergraduate and postgraduate courses are summarised below:

Undergraduate Core Courses

Geotectonics and Geomorphology: Enables the student to understand the study of the physical features of the surface of the earth and their relation to its geological structures.

Cartographic Techniques: Students are well - versant regarding the use of geographic maps for the analysis, recognition, and prediction of phenomena.

Human Geography: Students acquire a clear vision how human activity affects or is influenced by the earth's surface.

Thematic Mapping and Surveying: Learners perceivethe idea of elementary surveying and map making, which is a basic pre-requisite of a true geographer.

Climatology: Students provoke their thought towards understanding of dynamics of climate and weather with some concepts of basic meteorological measurements.

Hydrology and Oceanography: The study encompasses the occurrence, distribution, movement and properties of the waters of the earth and their relationship with the environment within each phase of the hydrologic cycle and the physical and biological properties and phenomena of the sea.

Statistical Methods in Geography: Students will be familiar with the science of collecting, exploring and presenting large amounts of

data to discover underlying patterns and trends. It helps them to become more scientific about decisions that need to be made.

Economic Geography: Students will know the study of the spatial variation of human economic activities – production, consumption, and exchange, with emphasis on resource.

Regional Planning and Development: The science of efficient placement of infrastructure and zoning for the sustainable growth of a region will be better perceived by students.

Soil and Biogeography: Students are aware of the study of the geographic distribution of soils, plants, animals, and other forms of life. It is concerned not only with habitation patterns but also with the factors responsible for variations in distribution.

Research Methodology and Fieldwork: Students gain knowledge regarding research methods, which are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic. Different tools for data collection, handling of logistics and other emergencies on field and skills in photography, mapping and videorecording are also taken care of.

Remote Sensing, GIS and GNSS: Students have specific theoretical as well as practical knowledge of remote sensing, GIS and GNSS and they can handle modern softwares in this respect.

Evolution of Geographical Thought: Students immerse themselves in the development of geographic knowledge in particular places, times, and contexts from ancient to post-modern times.

Hazard Management : Organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters are dealt with.

Department of Commerce

Programme specific outcome

Program Outcome (PO) :

Our esteemed institution offer 3-year two UG Commerce Program for its students; one is with Honours and the other is without Honours (*i.e.* General). After successful completion of said program (s), students are awarded with Bachelor of Commerce with Honours / without Honours Degree (B.Com. Honours / General Degree), as the case may be, by the affiliating University. On obtaining graduation degree, students become eligible to apply for any higher level Government job including Indian Revenue Service (IRS) and other cadre of Indian Administrative Service (IAS). Else, students can extend their study for postgraduate (PG) level or for professional courses too.

Program Specific Outcome (PSO) :

After obtaining B.Com with Honours Degree, students become eligible to pursue PG studies like Master of Commerce (M.Com.), Master of Business Administration (MBA) etc. On the other hand, after securing B.Com Degree with or without Honours, students become eligible to pursue professional studies such as Chartered Accountancy (CA), Cost Accountancy (CMA), Company Secretary (CS), Chartered Financial Analysis (CFA) etc. Else, they can apply for any higher level Government / Private job.

Course Outcome (CO) :

Three-year undergraduate (UG) commerce course under the syllabi and the course structure framed by the affiliating University, the University of Calcutta, is taught by the college for its beloved students. After successful completion of said course, students are awarded with Graduation Degree by the affiliating University. On obtaining graduation degree, students become eligible to apply any Government job including UPSC as well as to pursue their study for the postgraduate (PG) level.

ECONOMICS

Programme specific outcome:

1. Sound financial understanding and application in day to day life.
2. Understand how government helps in mediating between consumers and producers.
3. Understanding international relation in terms of economic co-operation.
4. Addressing various economic problems like unemployment, inflation etc.
5. How economic growth of a country affects in general income of a person.
6. Prescribe methods of improving health, education and other activities of life.
7. Good employment opportunity in teaching, research and industry.
8. Helps in starting new ventures as successful entrepreneurs.

Course outcome:

1. Introductory microeconomics:

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

2. Mathematical method for economics:

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

3. Introductory macroeconomics:

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payment.

4. Intermediate microeconomics:

The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the

previous semesters, mathematical tools are used to facilitate understanding of the basic concepts. This course looks at the behaviour of the consumer and the producer and also covers the behavior of a competitive firm

5. Intermediate macroeconomics:

This course introduces the students to formal modeling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

6. Statistical method for economics:

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It then develops the notion of probability, followed by probability distributions of discrete and continuous random variables and of joint distributions. This is followed by a discussion on sampling techniques used to collect survey data. The course introduces the notion of sampling distributions that act as a bridge between probability theory and statistical inference. The semester concludes with some topics in statistical inference that include point of interval estimation.

7. Intermediate microeconomics 2:

This course is a sequel to Intermediate Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers general equilibrium and welfare, imperfect markets and topics under information economics.

8. Intermediate macroeconomics 2:

This course is a sequel to Intermediate Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

9. Indian economy 1:

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

10. Development economics 1:

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

11. Indian economics 2:

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and

inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

12. Development economy 2:

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Department of MATHEMATICS (UG & PG)

Program Specific Outcomes (PSO)

1. Develop the skill to deal with the abstract ideas of Mathematics.
2. Become proficient in writing proofs.
3. Expertise in problem solving.
4. Acquire the skill to pursue career not only in school education but also in business, civil services, banking, finance etc.
5. Can continue study of Mathematics at the post graduate level and more.
6. Can apply Mathematical methods in problems of Mathematics and related fields of science and engineering.
7. Learn how to teach Mathematics in undergraduate level.
8. Develop the ability of analytical and logical thinking which will help them in all aspects of life.

UG: Course Outcomes (CO)

1+1+1 System

PAPER I

CLASSICAL ALGEBRA, MODERN ALGEBRA I, ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSIONS AND VECTOR ALGEBRA:

Learn concepts of Classical Algebra such as Complex numbers, Inequality, Integers, Theory of Equations, introductory ideas of Modern Algebra such as Set, Mapping, Relations and introduction of Group Theory and Analytical Geometry which includes Transformation of axes, Pair of Straight Lines, Circle, Ellipse, Parabola, Hyperbola, Rectangular Cartesian coordinates in Space, Equations of Plane, Straight lines in Space, Position Vectors, Vector Products, Application of Vector Algebra, Vector Equations

PAPER II

ANALYSIS I , EVALUATION OF INTEGRALS, LINEAR ALGEBRA AND VECTOR CALCULUS I:

Get the basic knowledge of Analysis including Real Number System, Set and Sequences of Real Numbers, Countability of Sets, Continuity of Real Valued Functions of Real Variables. Apart from that Methods of Evaluation of Definite and Indefinite Integrals, Matrices, Determinants, Vector Space, Vector Differentiation, Scalar and Vector Field.

PAPER III

MODERN ALGEBRA II AND LINEAR PROGRAMMING, GAME THEORY, ANALYSIS II AND DIFFERENTIAL EQUATIONS I:

In extension to the Modern Algebra Course in Paper I student learns Cosets, Cyclic Groups, Rings and Fields. Learn theories and problem solving mechanisms of Linear Programming Problems and Game Theory. Also as an extension of Paper II Analysis course, learns the Infinite Series of Real Numbers, Derivatives of Real Valued Functions of Real Variables. Finally methods to solve ordinary Differential equations and introduction to Partial Differential Equations

PAPER IV

REAL VALUED FUNCTIONS OF SEVERAL VARIABLES, APPLICATION OF CALCULUS, ANALYTICAL GEOMETRY OF THREE DIMENSIONS II, ANALYTICAL STATICS I AND ANALYTICAL DYNAMICS OF A PARTICLE I:

Learn concepts of function of several variables, for example Point Sets, Limit, Continuity, Differentiability, Jacobian etc. Then Application of Calculus which involves Asymptotes, Curvature, Envelopes, Concavity, Convexity, Sphere, Cone, Cylinder, Ellipsoid, Hyperboloid, Paraboloid, Surface of Revolution, Transformation of Axes, Friction, Astatic Equilibrium, Newton's Laws, Impact of Elastic Bodies, Accelerations, Damped Harmonic Oscillators, Motion in a Plane under Laws of Resistance,

PAPER V

ANALYSIS III, LINEAR ALGEBRA II, MODERN ALGEBRA II, TENSOR CALCULUS, DIFFERENTIAL EQUATION II OR GRAPG THEORY:

Get ideas of Compactness in R, Functions of Bounded Variations, Riemann Integration, Sequence and Series of Real Functions, Linear Transformation, Normal Subgroup, Homomorphism, Isomorphism, Tensor Calculus, Laplace Transformation and Series Solution of Ordinary Differential Equations or Graph Theory

PAPER VI

VECTOR CALCULUS II, ANALYTICAL STATICS II, ANALYTICAL DYNAMICS OF A PARTICLE II, HYDROSTATICS AND RIGID DYNAMICS:

Learns advance Vector Calculus, advance Analytical Statics and Dynamics, Hydrostatics and Rigid Dynamics

PAPER VII

ANALYSIS IV, METRIC SPACE, COMPLEX ANALYSIS, PROBABILITY AND STATISTICS:

Learns Improper Integral, Fourier Series and Multiple Integrals, Metric Space and Complex Functions and probability and statistical methods in detail.

PAPER VII

NUMERICAL ANALYSIS, COMPUTER PROGRAMMING AND PRACTICALS:

Familiarize oneself with the application of method of estimation in absence of exact solution or when finding exact solution is tough and also learn to write the computer programming of the numerical methods in C or Fortran, fundamentals of Computer Science and Boolean Algebra.

Course Outcomes (CO)

CBCS System

CC1

CALCULUS, GEOMETRY AND VECTOR ANALYSIS: Learn the foundational knowledge of Calculus, Geometry and Vector Analysis and learn to plot graphs of functions, sketch parametric curves, trace conics etc using free software.

CC2

ALGEBRA: Develop the basic ideas of Classical Algebra(Complex Number, Theory of Equation, Inequality), Abstract Algebra(Relation, Mapping, Integers) and Linear Algebra(Rank of a Matrix, System of Linear Equations etc).

CC3

REAL ANALYSIS: Get the ideas of Real Numbers, Countable and Uncountable Sets, Bounded and Unbounded Sets, Limit Points, Interior Points, Real Sequence, Subsequence in detail and learn to plot sequences and verify theorems through plotting of sequences.

CC4

GROUP THEORY-I: Learn Group, its properties and examples, Subgroup, its properties and examples, Cyclic Group, Permutation, Quotient Group, Homomorphisms, Isomorphisms.

CC5

THEORY OF REAL FUNCTIONS: Acquire the knowledge of Limit, Continuity and Differentiability of Real Functions.

CC6

RING THEORY AND LINEAR ALGEBRA-I: Learn the definition of Ring, Subring, Integral Domain, Field, Ideals, Ring Homomorphism and their properties and theorems in the Ring Theory and in Linear Algebra, the fundamentals of vector Space, Linear Transformation, Algebra of Linear Transformation, Eigen Values, Eigen Vectors.

CC7

ORDINARY DIFFERENTIAL EQUATION & MULTIVARIATE CALCULUS-I: Learn methods to solve Ordinary Differential Equations and introductory ideas of Multivariate Calculus (Concept of Neighbourhood, Limit Point, Interior Point, Chain Rule, Directional Derivatives).

CC8

RIEMANN INTEGRATION & SERIES OF FUNCTIONS: Get the knowledge of Riemann Integration, Improper Integral, Sequence and Series of Functions, Power Series, Fourier Series.

CC9

PARTIAL DIFFERENTIAL EQUATION & MULTIVARIATE CALCULUS-II: Learn methods to solve Partial Differential Equations (PDE) and some problems involving PDE and in Multivariate Calculus, learn Multiple Integrals, Vector Field, Divergence, Curl, Green's Theorem, Stoke's Theorem and Divergence Theorem.

CC10

MECHANICS: Learn Coplanar Forces in general, an arbitrary force system in space, Equilibrium in the presence of Sliding Friction force, Virtual Work, Stability of Equilibrium, Kinematics of a particle, Newton Laws of Motion and Law of Gravitation, Problems in Particle Dynamics, Planar motion of a particle, Motion of a particle in three dimensions, Linear Momentum Principle, Angular Momentum Principle, Energy Principle.

CC11

PROBABILITY & STATISTICS: Learn probability and statistical methods in detail and also learn to do the graphical representation of data.

CC12

GROUP THEORY-II & LINEAR ALGEBRA-II: Get the idea of Automorphism, External Direct Product, Inner Product Spaces and Norms, Dual Spaces, Eigen Spaces.

CC13

METRIC SPACE & COMPLEX ANALYSIS: Get the concept of Metric Spaces, Compactness, Connectedness and in Complex Analysis Stereographic Projections, Differentiability, Power Series, Complex Integration etc.

CC14

NUMERICAL METHODS: Familiarize oneself with the application of method of estimation in absence of exact solution or when finding exact solution is tough and also learn to write the computer programming of the numerical methods.

- From the elective **SKILL ENHANCEMENT COURSES** one can learn C, C++, Scientific Computing with SageMath and R and Mathematical Logic.
- From the elective **DISCIPLINE SPECIFIC ELECTIVE COURSES** one can get an overview of specialized sections of Mathematics which will help to choose the right track for future.

DEPARTMENT OF MATHEMATICS
Programme: M.Sc. in Pure Mathematics

PO No.	Programme Outcomes Upon completion of the M.Sc. Degree Programme, the graduate will be able to
PO-1	innovate and design complex Mathematical problems and solutions using Pure and Applied Mathematics
PO-2	equip the students to think in critical and logical manner
PO-3	Analyze the contemporary issues in the field of Mathematics and applied sciences
PO-4	opportunity of employment in schools and colleges as Mathematical Teachers and Professors, Analysts in Software Industries, Research and Development Organizations
PO-5	crack lectureship and fellowship exams approved by CSIR – NET and SET

PSO No.	Programme Specific Outcomes Upon completion of these courses the student would
PSO-1	magnify the logical skills and furnish the students for research with professional and ethical responsibility
PSO-2	enhance the abstract intelligence in solving problems in analysis and algebra
PSO-3	curriculum profound the base for scientific and technological computations
PSO-4	reinforce the mathematical ability and imparting practical knowledge through mathematical software
PSO-5	substantiate the students attitude to evolve new concepts in emerging fields

Course Title	LINEAR ALGEBRA	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of linear transformations and its representation by matrices	K2
CO-2	Discuss the concepts of polynomials and prime factorization of a polynomial	K2
CO-3	Demonstrate the properties of determinants and characteristic values	K3
CO-4	Analyze the concept of triangulation, diagonalization and decomposition	K4
CO-5	Evaluate the concepts of various bilinear forms	K5

Course Title	REAL ANALYSIS	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire the knowledge of countable sets, uncountable sets and compact sets in metric spaces	K2
CO-2	Apply the concept of continuity and compactness in metric spaces	K3
CO-3	Demonstrate Riemann Stieltjes integral and examine the properties of integration and differentiation	K4
CO-4	Analyze the convergence in sequences and series	K4
CO-5	Evaluate the concepts of linear transformation in vector spaces	K5

Course Title	ORDINARY DIFFERENTIAL EQUATIONS	
CO No.	Course Outcomes	Knowledge Level
CO-1	Obtain series solutions for second order ordinary differential equations both at ordinary and regular singular points	K2
CO-2	Construct systems of linear differential equations and identify the uniqueness	K3
CO-3	Demonstrate the solution of non-homogeneous linear systems and the properties linear system with constant and periodic coefficients	K3
CO-4	Analyze the existence and uniqueness solution of initial value problems	K4
CO-5	Determine the oscillations of second order equations	K5

Course Title	NUMBER THEORY	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of divisibility and primes	K2
CO-2	Solve the congruences of different degrees	K2
CO-3	Demonstrate about power residue, multiplicative groups, rings and fields	K3
CO-4	Discuss the ideas about quadratic residues and Jacobi symbol	K4
CO-5	Analyze the concepts of greatest integer function and recurrence functions	K5

Course Title	MATHEMATICAL PROGRAMMING	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of Graphical, Simplex and Dual methods.	K2
CO-2	Obtain solutions for Integer Programming and Gomory cutting plane Algorithm.	K2
CO-3	Solve integer linear programming and dynamic programming problems.	K3
CO-4	Analyze the concepts of constrained and unconstrained problems.	K4
CO-5	Compare the algorithms of constrained and unconstrained in non-linear programming problems.	K5

Course Title	ALGEBRA	
CO No.	Course Outcomes	Knowledge Level
CO-1	Identify the basic ideas of algebra including the concepts of groups and direct products.	K2
CO-2	Understand the concept of a particular Euclidean ring and other forms of polynomial rings.	K2
CO-3	Demonstrate knowledge of the structures of fields and extension fields	K3
CO-4	Appreciate the concept of Galois theory and finite fields	K4
CO-5	Compose clear and accurate proofs using the concepts of linear transformations	K5

Course Title	COMPLEX ANALYSIS	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand analytic functions, rational functions and elementary Riemann surfaces.	K2
CO-2	Apply Cauchy's theorem for a rectangle and disk.	K2
CO-3	Derive the calculus of residues and harmonic functions.	K3
CO-4	Determine series and product development, partial fractions and factorization.	K4
CO-5	Evaluate Riemann mapping, conformal mapping of polygons and rectangle.	K5

Course Title	PARTIAL DIFFERENTIAL EQUATIONS	
CODE	18MSPC208	
CO No.	Course Outcomes	Knowledge Level
CO-1	Obtain solutions for non-linear partial differential equations using Cauchy's, Charpit's and Jacobi's Method.	K2
CO-2	Understand the concept of differential equations with constant and variable coefficients and solve them.	K2
CO-3	Demonstrate the knowledge of linear hyperbolic equations and the method of integral transforms.	K3
CO-4	Analyze the boundary value problems and solve them by using separation of variables.	K4
CO-5	Compose clear and accurate proofs using the concepts of Partial Differential Equations	K5

Course Title	MATHEMATICAL STATISTICS	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of marginal and conditional distributions	K2
CO-2	Apply the ideas of mathematical expectation and chebyshev's inequality to solve problems	K3
CO-3	Determine the Poisson, Binomial, Normal and Gamma distributions	K4
CO-4	Analyze chi-square, t distributions and their applications	K4
CO-5	Evaluate significance test and theory of estimation	K5

Course Title	ADVANCED MULTI – SKILL DEVELOPMENT PAPER	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of General Awareness and Scientific Aptitude.	K2
CO-2	Apply Logical Reasoning	K3
CO-3	Analyze Numerical Reasoning and Quantitative Aptitude	K4
CO-4	Identify and improve the skills in PPT, interview, abstract writing and counseling	K3
CO-5	Discuss the movement and gestures to be avoided in Group Discussion and study about online services.	K4

Course Structure for M.Sc. in Pure Mathematics
Semester-wise distribution of Courses (Under CBCS System)

Semester	Course ID	Group	Name of the Courses	Page Number	Full Marks	Credit Point	Classes per week
I	PM1/01	Gr.-A	Group Theory	4	25	4	5 hr
		Gr.-B	Ring Theory	5	25		
	PM1/02		Real Analysis -I	6	50	4	5 hr
	PM1/03	Gr.-A	Complex Analysis -I	8	25	4	5 hr
		Gr.-B	Ordinary Differential Equation	9	25		
	PM1/04	Gr.-A	General Topology -I	10	30	4	5 hr
		Gr.-B	Differential Geometry of Curves & Surfaces	11	20		
PM1/05	Gr.-A	Discrete Mathematics -I	12	30	4	5 hr	
	Gr.-B	Multivariate Calculus	13	20			
			Total		250	20	25 hr
II	PM2/06		Linear Algebra	14	50	4	5 hr
	PM2/07	Gr.-A	Real Analysis -II	16	25		
		Gr.-B	Complex Analysis -II	18	25		
	PM2/08		General Topology -II	19	50	4	5 hr
	PM2/09		Functional Analysis	21	50	4	5 hr
	PM2/10	Gr.-A	Discrete Mathematics - II	23	20	4	5 hr
Gr.-B		Theory of Manifold	24	30			
			Total		250	20	25 hr
III	PM3/11	Gr.-A	Field Extension	26	25	4	5 hr
		Gr.-B	Algebraic Topology - I	27	25		
	PM3/E1/101-111		Elective -I	2	50	4	5 hr
	PM3/E2/201-211		Elective -II	3	50	4	5 hr
	CBCC - A		Choice Based Credit Course - A		50	4	5 hr
CBCC - B		Choice Based Credit Course - B		50	4	5 hr	

			Total	250	20	25 hr	
IV	PM4/12	Gr.-A	Algebraic Topology - II	28	30	4	5 hr
		Gr.-B	Partial Differential Equation	29	20		
	PM4/13	Gr.-A	Computational Mathematics (Theory)	30	25	4	5 hr
		Gr.-B	(OP1)* Mathematical Logic	31	25		
			(OP2)* Number Theory	32	25		
			(OP3)* Distribution Theory	33	25		
			(OP4)* Calculus of Variation & Integral Equation	34	25		
			(OP5)* Automata Theory	35	25		
			(OP6)* Mechanics	36	25		
			(OP7)* Algebraic Geometry	37	25		
	(OP8)* Galois Theory		38	25			
	PM4/E1/101-111		Elective -I	2	50	4	5 hr
	PM4/E2/201-211		Elective -II	3	50	4	5 hr
PM4/14/Pr		Computational Mathematics (Practical)	39	25	2	3 hr	
PM4/15		Dissertation, Internal Assessment, Seminar & Grand Viva		25	2	2 hr	
			Total	250	20	25 hr	
			Grand Total	1000	80		

***N.B. : For the Course PM4/13 Gr.-B, a student has to opt (subject to availability) for any one of the subjects from (OP1), (OP2), (OP3), (OP4), (OP5), (OP6), (OP7) and (OP8).**

Serial No.	Course ID	Subject Code	Name of the Courses	Page Number	Full Marks
1	PM3/E1	101	Abstract Harmonic Analysis -I	40	50
	PM4/E1		Abstract Harmonic Analysis -II	41	50
2	PM3/E1	102	Algebraic Aspects of Cryptology -I (Theory & Practical)	42	50 (40+10)
	PM4/E1		Algebraic Aspects of Cryptology -II (Theory & Practical)	44	50 (40+10)
3	PM3/E1	103	Advanced Real Analysis -I	46	50
	PM4/E1		Advanced Real Analysis -II	47	50
4	PM3/E1	104	Advanced Complex Analysis -I	48	50
	PM4/E1		Advanced Complex Analysis -II	49	50
5	PM3/E1	105	Advanced Riemannian Manifold -I	50	50
	PM4/E1		Advanced Riemannian Manifold -II	51	50
6	PM3/E1	106	Advanced Algebraic Topology -I	52	50
	PM4/E1		Advanced Algebraic Topology -II	53	50
7	PM3/E1	107	Universal Algebra, Category theory & Lattice theory -I	54	50
	PM4/E1		Universal Algebra, Category theory & Lattice theory -II	55	50
8	PM3/E1	108	Advanced Graph Theory -I	56	50
	PM4/E1		Advanced Graph Theory -II	57	50
9	PM3/E1	109	Algebraic Coding Theory -I	58	50
	PM4/E1		Algebraic Coding Theory -II	59	50
10	PM3/E1	110	Differential Topology -I	60	50
	PM4/E1		Differential Topology -II	61	50
11	PM3/E1	111	Theory of Frames -I	62	50
	PM4/E1		Theory of Frames -II	63	50

****N.B. : A student has to opt (subject to availability) for any one of the subjects from abovelist.**

Serial No.	Course ID	Subject Code	Name of the Courses	Page Number	Full Marks
1	PM3/E2	201	Modules and Rings -I	64	50
	PM4/E2		Modules and Rings -II	65	50
2	PM3/E2	202	Advanced Functional Analysis -I	66	50
	PM4/E2		Advanced Functional Analysis -II	67	50
3	PM3/E2	203	Fourier Analysis -I	68	50
	PM4/E2		Fourier Analysis -II	69	50
4	PM3/E2	204	Rings of Continuous functions -I	70	50
	PM4/E2		Rings of Continuous functions -II	71	50
5	PM3/E2	205	Structures on Manifolds -I	72	50
	PM4/E2		Structures on Manifolds -II	73	50
6	PM3/E2	206	Advanced Number Theory -I	74	50
	PM4/E2		Advanced Number Theory -II	75	50
7	PM3/E2	207	Advanced General Topology -I	76	50
	PM4/E2		Advanced General Topology -II	77	50
8	PM3/E2	208	Theory of Linear Operators -I	78	50
	PM4/E2		Theory of Linear Operators -II	79	50
9	PM3/E2	209	Banach Algebra -I	80	50
	PM4/E2		Banach Algebra -II	81	50
10	PM3/E2	210	Non-standard Analysis -I	82	50
	PM4/E2		Non-standard Analysis -II	83	50
11	PM3/E2	211	Dynamical System and Integral Equations -I	84	50
	PM4/E2		Dynamical System and Integral Equations -II	85	50

*****N.B. : A student has to opt (subject to availability) for any one of the subjects from above list.**

Department of Chemistry

B.Sc. CHEMISTRY (HONOURS) UNDER CBCS, University of Calcutta

The CBCS Course curriculum of the discipline of Chemistry is well designed and very promising. The core course would help to enrich the subject knowledge of the students and increase their confidence level in the field of both academia and industry. Generic electives make integration among various interdisciplinary courses to fulfill the vision and mission of designing the course. The introduction of Skill Enhancement Courses (SEC) would help to gain more powerful knowledge not only in their core Chemistry subject but also in interrelated multidisciplinary subjects both theoretically and practically. The inclusion of Discipline Specific Courses (DSE) has brought an opportunity in front of students to gain knowledge on various naturally and industrially important useful materials and also helps them to familiar and expert in handling different chemistry based software after proper training. In brief the student graduated with this type of curriculum would be able to disseminate subject knowledge along with necessary skills to suffice their capabilities for academia, entrepreneurship and industry.

Course Outcomes

Semester	Course Code	Course Outcomes
	CC-1	CO-1: To know extra nuclear structure of atom CO-2: To understand acid base reactions CO-3: To know the basic concepts of redox reactions CO-4: To learn the basics concepts of organic chemistry specially on chemical bonding and physical properties CO-5: To study the estimation of ions or salts by acid-base titration method and oxidation-reduction titration method

SEM-I		CO-6: To learn experimentally about the separation of compounds from a solid binary mixture by using common laboratory reagents
	CC-2	<p>CO-1: To understand the basic concept of kinetic theory of gases and know how to solve numerical problems related to that topic.</p> <p>CO-2: To learn the transport processes of liquids and gases.</p> <p>CO-3: To understand rate laws, rate equations of different types of reactions, determine rate constant values, order of reactions, effect of temperature and other factors on reaction rate, homogenous catalysis, catalytic effect on reaction rate, equations related to chemical catalysis</p> <p>CO-4: To learn the basic concepts of Stereochemistry</p> <p>CO-5: To understand about the formation and stability of reaction intermediates and their electrophilic and nucleophilic behavior.</p> <p>CO-6: To study the kinetics of decomposition of H₂O₂, acid-catalyzed hydrolysis of methyl acetate, viscosity measurement of unknown liquids, measurement of solubility of sparingly soluble salts.</p> <p>CO-7: To understand experimentally how to determine the boiling points of organic liquid compounds.</p>
SEM-2	CC-3	<p>CO-1: To learn stereochemistry of chiral compounds arises due to presence of stereo-axis; concept of prostereoisomerism and concept of conformations of stereo isomers.</p> <p>CO-2: To understand reaction kinetics, reaction thermodynamics and tautomerism of organic compounds.</p> <p>CO-3: To know the concept, types, reaction mechanism and examples of elimination, free-radical and nucleohilic substitution reactions.</p> <p>CO-4: To learn experimentally how to synthesize, calculate the yield and determine the melting point of pure organic compounds in the laboratory.</p>
	CC-4	<p>CO-1: To learn about the basic concepts and types of chemical bonding, laws, rules and equations for formation of chemical bonds, solubility, hybridization and dipole moment of molecules.</p> <p>CO-2: To study the modern approaches of chemical bonding (Molecular Orbital Theory, Metallic Bonding concept, Role of weak intermolecular forces)</p> <p>CO-3: To understand about the concept of radioactivity and radioactive compounds, nuclear reactions, artificial radioactivity, radio carbon dating, hazards of radiation and safety measures.</p> <p>CO-4: To know experimentally how to estimate the percentage of chlorine in bleaching powder; vitamin C; arsenic and antimony in a sample by iodimetric titration method. Students can also learn how to estimate Cu in brass, Cr and Mn in steel and Fe in cement.</p>
	CC-5	<p>CO-1: To learn in detail about the first and second laws of Chemical Thermodynamics and the related terms; to get idea about thermo-chemistry and thermodynamic relationships and system of variable compositions.</p> <p>CO-2: To gain vast knowledge on chemical equilibrium and electrochemistry.</p> <p>CO-3: To learn experimentally how to do the potentiometric and conductometric titrations of different compositions, determine the K_a of weak acid and heat of neutralization of a strong acid by a strong base.</p>
	CC-6	<p>CO-1: To study in detail about modern periodic table, physical and chemical properties of the elements along a group or period, factors influences those properties, relativistic effects and inert pair effect.</p> <p>CO-2: To study the chemistry of s and p block elements including noble gases and their compounds in detail.</p> <p>CO-3: To learn about inorganic polymers in detail.</p>

SEM-3		<p>CO-4: 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.</p> <p>CO-5: To learn the complexometric and gravimetric estimation of different ions, chromatographic separation of (i) Ni (II) and Cu (II) ions, (ii) Fe (III) and Al (III) ions.</p>
	CC-7	<p>CO-1: To learn in detail about the synthesis, properties, chemical reactions and reaction mechanisms of alkenes and alkynes</p> <p>CO-2: To understand about different types of electrophilic and nucleophilic aromatic substitution reactions, reaction intermediates and their mechanisms.</p> <p>CO-3: To study the properties and reactions of carbonyl compounds and corresponding reaction mechanisms.</p> <p>CO-4: To learn preparations, reactions and corresponding reaction mechanisms of organometallic compounds.</p> <p>CO-5: To study experimentally the qualitative detection solid and liquid organic compounds.</p> <p>CO-5: To learn experimentally the quantitative estimation of organic compounds by titration method.</p>
	SEC-A	<p>SEC-1. MATHEMATICS AND STATISTICS FOR CHEMISTS</p> <p>CO-1: Helps to understand functions, differential equations, probability, vectors, matrices and determinants.</p> <p>CO-2: To learn about qualitative and quantitative aspects of analysis and helps to understand how to present a data after analysis.</p> <p>SEC-2. ANALYTICAL CLINICAL BIOCHEMISTRY</p> <p>CO-1: Helps to understand about the preparation, structures, reactions and biological importance of carbohydrates, proteins, enzymes, lipids and lipoproteins.</p> <p>CO-2: To know the biochemistry of different diseases through a diagnostic approach by blood and urine analysis.</p> <p>CO-3: To learn how to isolate proteins and how to perform the qualitative estimation of carbohydrate, proteins and lipids.</p> <p>CO-4: To study the quantitative estimation of carbohydrate, cholesterol, nucleic acids, determination of the iodine number of oil and saponification number of oil.</p>
SEM-4	CC-8	<p>CO-1: To understand in detail about the synthesis, separation, properties, identification, chemical reactions and their corresponding mechanism of nitrogen containing compounds.</p> <p>CO-2: Discussion about different kinds of rearrangement reactions.</p> <p>CO-3: Helps to know the logic of organic synthesis</p> <p>CO-4: To study UV-Visible, IR and NMR spectroscopy in detail.</p> <p>CO-5: Helps to know experimentally the qualitative analysis of single solid organic compounds</p>
	CC-9	<p>CO-1: Helps to understand about the applications of Thermodynamics in Colligative Properties and Phase Equilibrium</p> <p>CO-2: To study the fundamentals of Quantum Mechanics</p> <p>CO-3: Helps to know the Bravais Lattice and Laws of Crystallography, Crystal Planes and Specific Heat of Solid</p> <p>CO-4: To know experimentally how to study phase diagram of a Phenol-Water system, kinetic study of inversion of cane sugar, determination of partition co-efficient</p>

		value, pH of an unknown solution and pH metric titration of an acid against strongbase.
	CC-10	<p>CO-1: Helps to understand about the structures, stability, colour, magnetism and Orgel diagram of the co-ordination compounds on the basis of modern concepts of chemical bonding.</p> <p>CO-2: To study the chemical and physical properties of d and f Block elements and their compounds.</p> <p>CO-3: To learn the reaction kinetics and mechanisms of inorganic reactions. CO-4: To study experimentally how to synthesize inorganic complexes and determine the λ_{max} values of inorganic complexes.</p> <p>CO-5: To calculate the 10Dq value by spectrophotometric method.</p>
	SEC-B	<p>SEC-3. PHARMACEUTICALS CHEMISTRY</p> <p>CO-1: Helps to understand about the drug discovery, design and development of representative drugs of the following classes: Antipyretic, Analgesics, Anti-inflammatory, Anti-bacterial, Antifungal, Antiviral, Antibiotics, Anti-laprosy, Central Nervous System agents, HIV-AIDS related drugs</p> <p>CO-2: To know about aerobic and anaerobic fermentation, importance of Vitamins and Amino acids, synthesis of Penicillin, Cephalosporin, Chloromycetin, Streptomycin and their role as an antibiotic.</p> <p>CO-3: To learn experimentally how to prepare aspirin in the laboratory and how to analyze it.</p> <p>CO-4: To learn experimentally how to prepare magnesium bisilicate in the laboratory.</p> <p>SEC-4. PESTICIDE CHEMISTRY</p> <p>CO-1: Helps to understand about the preparation, structures, properties, reactions, benefits and adverse effects of pesticide compounds</p> <p>CO-2: Helps to understand how to calculate acidity/ alkalinity in a given sample of pesticide formulations as per BIS specifications.</p> <p>CO-3: To learn experimentally how to prepare organophosphates, phosphonates and thiophosphates.</p> <p>CO-4: To study how to prepare inorganic complexes in the laboratory.</p> <p>CO-5: To know how to determine the co-ordination compounds by spectrophotometric method</p>
	CC-11	<p>CO-1: Helps to understand the fundamental concept, basic terms, derivation and application of Quantum Mechanics</p> <p>CO-2: To know about the necessary laws, rules, terms, expressions and derivations statistical thermodynamics</p> <p>CO-3: To learn laws, rules and equations for numerical analysis of Roots of Equation and Least-Squares Fitting.</p> <p>CO-4: To study about the Computer Programming on Roots of equation, Numerical differentiation and Numerical integration.</p>
		<p>CO-1: To learn in detail about the synthesis, properties, chemical reactions and reaction mechanisms of polynuclear hydrocarbons and their derivatives.</p> <p>CO-2: To study the chemical reactions, properties and synthesis of heterocyclic compounds.</p> <p>CO-3: To know in detail about the stereochemistry, properties and chemical</p>

SEM-5	CC-12	<p>reactions of alicyclic compounds.</p> <p>CO-4: To learn the mechanism, stereochemistry and regioselectivity of pericyclic reactions.</p> <p>CO-5: Helps to understand about the classification, structure, properties, reactions and use of carbohydrate molecules.</p> <p>CO-6: Deals with the synthesis, structure, properties, chemical and biological reactions of amino acids, peptides and nucleic acids.</p> <p>CO-7: To learn experimentally how to separate molecules by chromatographic methods</p> <p>CO-8: To study how to analyze the Organic compounds by spectroscopic techniques.</p>
	DSE	<p>A-1. MOLECULAR MODELLING & DRUG DESIGN</p> <p>CO-1: Helps to learn about Molecular Modelling, Force Fields, Energy Minimization and Computer Simulation.</p> <p>CO-2: To study about Molecular Dynamics & Monte Carlo Simulation, Structure Prediction and Drug Design.</p> <p>CO-3: To learn how to optimize C-C bond lengths in different Organic molecules, Visualize the molecular orbitals, electron density and electrostatic potential maps of different molecules, perform a conformational analysis of molecules, relate the acidity of hydrogen halides and basicity of nitrogen containing bases.</p> <p>CO-4: To study how to compare the shapes of molecules, build and minimize organic compounds containing various functional groups, compute resonance energy of different molecules and determine the heat of hydration values.</p> <p>A-2. APPLICATIONS OF COMPUTERS IN CHEMISTRY</p> <p>CO-1: Helps to understand about the basics of computer programming (FORTRAN), creating and application of spreadsheet software (MS Excel)</p> <p>CO-2: Helps to know about statistical data analysis.</p> <p>CO-3: To learn how to prepare graphs by using spreadsheet, help to determine vapour pressure, rate constant, equilibrium constant, molar extinction coefficient value, concentration of ions at equilibrium and molar enthalpy of vapourisation.</p> <p>CO-4: To study about the Acid-Base Titration Curve, Plotting of First and Second derivative Curve for pH metric and Potentiometric titrations, Calculation and Plotting of a Precipitation Titration Curve with MS Excel, Michaelis-Menten Kinetics for Enzyme Catalysis using Linear and Non - Linear Regression.</p> <p>B-1. INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE</p> <p>CO-1: Helps to understand about the manufacture, properties, compositions, classes and applications of industrially important materials such as ceramics, glasses, cements, fertilizers, surface coating materials and batteries.</p> <p>CO-2: To know about alloys, manufacture of steel, composition and properties of different types of steels.</p> <p>CO-3: To learn about the general principles, properties, classification, industrial use, deactivation and regeneration of catalysis.</p> <p>CO-4: Helps to understand about the preparation and explosive properties of organic and inorganic explosives and the basic idea of rocket propellant.</p>

		<p>CO-5: To learn how to analyze the composition of cement, composition of percentage of metals in alloy, electroless metallic coatings on ceramic and plastic.</p> <p>CO-6: To know how to determine free acidity in ammonium sulphate fertilizer, estimation of Calcium in Calcium ammonium nitrate fertilizer and phosphoric acid in superphosphate fertilizer.</p> <p>B-2. NOVEL INORGANIC SOLIDS</p> <p>CO-1: To learn about the synthesis and modification of inorganic solids and their technological importance</p> <p>CO-2: To study the overview of nanostructures and nanomaterials; to know the preparation, classification, control of self-assembly and use of nanomaterials as bio-nanocomposite, nanotube, nanowire and other bio-functional materials.</p> <p>CO-3: To learn about the engineering materials specially composite materials for mechanical construction.</p> <p>CO-4: To know about the manufacturing, properties, classification and application of conducting polymer materials.</p> <p>CO-5: To understand how to synthesize hydro-gel by co-precipitation method and silver and gold nanoparticles.</p> <p>CO-6: Determination of ions by cation exchange method and total difference of solids in a composite material.</p>
SEM-6	CC-13	<p>CO-1: To study the Theoretical Principles in Qualitative Analysis</p> <p>CO-2: To learn about Bioinorganic Chemistry and Organometallic Chemistry</p> <p>CO-3: To know about the catalytic role of organometallic compounds in different types of industrial processes.</p> <p>CO-4: To study experimentally the qualitative detection of known and unknown radicals and insoluble materials in a mixture.</p>
	CC-14	<p>CO-1: To learn in detail about molecular spectroscopy.</p> <p>CO-2: To understand about the basic principles and laws of Photochemistry and also get idea about the theory of reaction rate.</p> <p>CO-3: To know details about surface energy and surface tension; Classification, Adsorption Isotherms and applications of Adsorption; Classification, rules and properties of Colloids.</p> <p>CO-4: To learn about the fundamental concepts, important equations, properties and applications of polarizability and dipole moment.</p> <p>CO-5: To know how to determine surface tension of a liquid; Indicator constant of an acid base indicator; pH of an unknown buffer solution and CMC of a micelle experimentally.</p> <p>CO-6: To study the kinetics of $K_2S_2O_8 + KI$ reaction and Verification of Beer and Lambert's Law for $KMnO_4$ and $K_2Cr_2O_7$ solution experimentally.</p>
	DSE	<p>A-3. GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS</p> <p>CO-1: To learn about green chemistry and its necessity.</p> <p>CO-2: To study about the principles of green chemistry and designing the green synthetic routes.</p> <p>CO-3: To know about the examples of green reactions and future trends in green reaction.</p> <p>CO-4: To learn the synthesis, psychological properties, isolation medicinal</p>

importance and other synthetic use of terpenes and alkaloids

CO-5: To learn how to perform green synthesis of a number of organic compounds in the laboratory.

A-4. ANALYTICAL METHODS IN CHEMISTRY

CO-1: To study the fundamental laws of spectroscopy and Selection rules, to know the basic principles of Instrumentation for UV-visible spectroscopy and Infra-red spectroscopy and their use for the determination of composition of inorganic complexes, estimation of metal ions in aqueous solution, quantitative analysis of geometrical isomers and keto-enol tautomerism.

CO-2: To learn in detail about the Flame Atomic Absorption and Emission Spectrometry and its application.

CO-3: To know the basic concepts of thermogravimetry and quantitative estimation of Ca and Mg from their mixture, to learn about the electroanalytical methods and their applications for the determination of equivalence point and pKa values.

CO-4: To learn experimentally about different types of separation techniques such as Solvent extraction technique and Chromatography technique.

CO-5: To learn the methods of separation of stereoisomers, calculation of enantiomeric and diastereomeric excess ratios and determination enantiomeric composition by spectral, chemical and chromatographic data analysis.

CO-6: To study experimentally how to separate a mixture of monosaccharides, a mixture of dyes and active ingredients of plants, flowers and juices by chromatography method.

CO-7: To learn experimentally how to separate a mixture of ions by solvent extraction technique; determination of pH of soil and estimation of Ca, Mg and phosphate ion in soil.

CO-8: To determine the pKa values, COD and BOD by Spectrophotometry method in presence of an indicator.

B-3. POLYMER CHEMISTRY

CO-1: To learn about the history, classification and functionality of polymeric materials.

CO-2: To know about the kinetics of polymerization, details on crystallization and morphology of crystalline polymers, determination of crystalline melting point of a crystalline material and the factors effecting crystalline melting point.

CO-3: To understand the nature and structure of polymers, determination of molecular weight of polymers and thermodynamics of polymer solution.

CO-4: To study the preparation, structure, properties and application of different types of addition and condensation polymers.

CO-5: To know how to prepare polymers by using free radical polymerization, redox polymerization, interfacial polymerization, precipitation polymerization, addition polymerization and condensation polymerization process.

CO-6: To learn experimentally how to characterize and analyze a polymeric compound or material.

B-4. DISSERTATION

CO-1: To know how to do research work and write a review article on a particular field/topic as assigned by the teacher

	CO-2: To know how to handle the technical devices for presenting research works.
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Program Outcomes

PO-1: Disciplinary knowledge and skill: A graduate student is expected to be capable of demonstrating comprehensive knowledge and understanding both theoretical and practical knowledge in all disciplines of Chemistry. Students can solve their subjective problems very methodically, independently and finally draw a logical conclusion. Further, the student will be capable of applying modern technologies, handling advanced instruments and Chemistry related soft-wares for chemical analysis, characterization of materials and in separation technology.

PO-2: Skilled communicator: The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.

PO-3: Critical thinker and problem solver: The course curriculum also includes components that can be helpful to graduate students to develop critical thinking and to design, carry out, record and analyze the results of chemical reactions. Students will be able to think and apply evidence based comparative chemistry approach to explain chemical synthesis and analysis.

PO-4: Sense of inquiry: It is expected that the course curriculum will develop an inquisitive characteristics among the students through appropriate questions, planning and reporting experimental investigation.

PO-5: Team player: The course curriculum has been designed to provide opportunity to act as team player by contributing in laboratory, field based situation and industry.

PO-6: Skilled project manager: The course curriculum has been designed in such a manner as to enabling a graduate student to become a skilled project manager by acquiring knowledge about chemistry project management, writing, planning, study of ethical standards and rules and regulations pertaining to scientific project operation.

PO-7: Digitally literate: The course curriculum has been so designed to impart a good working knowledge in understanding and carrying out data analysis, use of library search tools, use of chemical simulation software and related computational work.

PO-8: Ethical awareness: A graduate student requires understanding and developing ethical awareness or reasoning which is adequately provided through the course curriculum. Students

can also create an awareness of the impact of chemistry on the environment, society, and also make development outside the scientific community.

PO-9: Environmental Awareness: As an inhabitant of this green planet a Chemistry graduate student should have many social responsibilities. The course curriculum is designed to teach a Chemistry graduate student 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 hazardous ones in every aspect.

PO-10: Lifelong learner: The course curriculum is designed to inculcate a habit of learning continuously through use of advanced ICT technique and other available e-techniques, e-books and e-journals for personal academic growth.

PO-11: Analytical skill development and job opportunity: The course curriculum is designed in such a way that Chemistry graduate students can handle many Chemistry based software, 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.

Programme Specific Outcomes

PSO-1: Core competency: The chemistry graduates are expected to gain knowledge of the fundamental concepts of chemistry and applied chemistry through theory and practical. These fundamental concepts would be reflected in the latest understanding of the field to keep continuing its progression.

PSO-2: Communication skills: Chemistry graduates are expected to possess minimum standards of communication skills to read and understand documents so that they can solve their problems very methodically, independently and with logical argument. Graduates are expected to build good communication skill so that they can easily share their idea/finding/concepts to others.

PSO-3: Critical thinking: Chemistry graduates are expected to achieve critical thinking ability to design, carry out, record and analyze the results of chemical reactions. They can have that much potential and confidence that they can overcome many difficulties with the help of their sharp scientific knowledge and logical approaches.

PSO-4: Psychological skills: Chemistry graduates are expected to possess basic psychological skills so that they can deal with individuals and students of various socio-cultural, economic and educational levels. Psychological skills are very important for proper mind setting during

performing, observing and giving conclusion of a particular reaction. It is also important for self-compassion, self-reflection, interpersonal relationships, and emotional management.

PSO-5: Problem-solving: Graduates are expected to be well trained with problem-solving philosophical approaches that are pertinent across the disciplines.

PSO-6: Analytical skill development and job opportunity: Chemistry graduates are expected to possess sufficient knowledge how to synthesize a chemical compound and perform necessary characterization and analysis in support of the formation of the product by using modern analytical tools and advanced technologies. Because of this course curriculum chemistry graduates have lot of opportunity to get job not only in academic and administrative field but also in industry.

PSO-7: Research motivation: Chemistry graduates are expected to be technically well trained with modern devices and Chemistry based software and has powerful knowledge in different disciplines of Chemistry so they can easily involve themselves in theory and laboratory-based research activities.

PSO-8: Teamwork: Graduates are expected to be team players, with productive co-operations involving members from diverse socio-cultural backgrounds.

PSO-9: Digital Literacy: Graduates are expected to be digitally literate for them to enroll and increase their core competency via e-learning resources such as MOOC and other digital tools for lifelong learning.

PSO-10: Social Awareness: As an inhabitant of this green world it is our duty to make our planet clean and suitable for living to all. In this context Chemistry graduates are expected to be more aware about finding green chemical reaction routes for sustainable development. They are expected to maintain good laboratory practices and safety.

B.Sc. CHEMISTRY (General) UNDER CBCS, University of Calcutta

Course Outcomes of Chemistry Generic Elective

[For students having Honours in subjects other than Chemistry]

Semester	Course Code [CEM-G]	Course Outcomes
SEM 1	CC1/GE1	<p>CO 1. To learn about the Kinetic Theory of Gases and Real Gases. To get an idea about the liquid state of matter, chemical kinetics.</p> <p>CO 2. To learn the basic concept of Atomic Structure, Chemical Periodicity and Acids and Bases.</p> <p>CO 3. To learn about the fundamentals of organic chemistry, stereochemistry, nucleophilic substitution and elimination reactions.</p> <p>CO 4. To learn experimentally the quantitative estimation of some compounds and ions in a solution by using iodometric titration, permanganate titration and dichromate titration.</p>

SEM 2	CC2/GE2	<p>CO 1. To learn about Thermodynamics, Chemical Equilibrium, Solutions, Phase Equilibria and Solids..</p> <p>CO 2. To learn the basic concept of Aliphatic Hydrocarbons.</p> <p>CO 3. To learn about the Error Analysis and Computer applications.</p> <p>CO 4. To understand the various types of Redox Reactions and their applications</p> <p>CO 5. To learn experimentally the how to study the kinetics of some reactions, viscosity of unknown liquid, surface tension of a liquid and solubility of sparingly soluble salt.</p>
SEM 3	CC3/GE3	<p>CO 1. To understand Chemical Bonding and Molecular Structure and also to learn about the p-Block Elements, Transition Elements and Co- ordination Chemistry.</p> <p>CO 2. To learn the basic concept of Aromatic Hydrocarbons, Organometallic Compounds and Aryl Halides.</p> <p>CO 3. To get detailed knowledge of Electrochemistry.</p> <p>CO 4. To study experimentally the qualitative detection of known and unknown radicals in a mixture.</p>
	SEC (A)	<p>SEC-1. Basic Analytical Chemistry</p> <p>CO 1. To get a basic idea of analytical chemistry, sampling, accuracy and precision, sources of errors in analytical measurements.</p> <p>CO 2. To learn about the analysis of soil, cosmetics, water and food products.</p> <p>CO 3. To understand Chromatography and Ion-exchange phenomenon.</p> <p>SEC-2. Analytical clinical biochemistry</p> <p>CO 1. To learn about the preparation, structures, reactions and biological importance of carbohydrates, proteins, enzymes, lipids and lipoproteins.</p> <p>CO 2. To know the biochemistry of different diseases through a diagnostic approach by blood and urine analysis.</p>

Semester	Course Code [CEM-G]	Course Outcomes
SEM 4	CC4/GE4	<p>CO 1. To learn about Alcohols, Phenols, Ethers, Carbonyl Compounds, Amines, Diazonium Salts, Amino Acids and Carbohydrates.</p> <p>CO 2. To learn the basic concept of Crystal Field Theory.</p> <p>CO 3. To learn about the fundamentals of Quantum Chemistry and Spectroscopy.</p> <p>CO 4. To learn experimentally the qualitative analysis of single solidorganic compound(s) and identification of a pure organic compound</p>
	SEC (B)	<p>SEC-3. Pharmaceuticals Chemistry</p> <p>CO 1. To learn about the drug discovery, design and development of representative drugs of the following classes: Analgesics, Antipyretic, Anti-inflammatory, Anti-bacterial, Antifungal, Antiviral, Antibiotics, Anti-laprosy, Central Nervous System agents, HIV-AIDS related drugs. CO 2. To get idea about aerobic and anaerobic fermentation.</p> <p>SEC-4. Pesticide Chemistry</p> <p>CO 1. To learn about the preparation, structures, properties, reactions, benefits and adverse effects of representative pesticide of the following classes: Organochlorines, Organophosphates, Carbamates, Quinones.</p>
SEM 5	DSE (A)	<p>DSE A-1. Novel Inorganic Solids</p> <p>CO 1. Introduces students with advance fields of chemistry like synthetic modification of different industrially important Inorganic solids, synthesis of nano material, polymers etc.</p> <p>CO 2. To understand how to synthesize hydro-gel by co-precipitation method and silver and gold nanoparticles.</p> <p>CO 3. Determination of ions by cation exchange method and total difference of solids in a composite material.</p> <p>DSE A-2. Inorganic Materials Of Industrial Importance</p> <p>CO 1. Students will learn the synthetic procedure and use of different commercially important materials like silicates, fertilizers, alloys, catalysts, surface coating materials and batteries.</p> <p>CO 2. To learn about the general principles, properties, classification, industrial use, deactivation and regeneration of catalysis.</p> <p>CO 3. To learn about the preparation and explosive properties of lead azide, PETN, RDX and the basic idea of rocket propellant.</p> <p>CO 4. The practical course helps to to learn how to analyze the composition of dolomite, composition of percentage of metals in alloy, electroless metallic coatings on ceramic and plastic.</p> <p>CO 5. To know how to determine free acidity in ammonium sulphate fertilizer, estimation of Calcium in Calcium ammonium nitrate fertilizer and phosphoric acid in superphosphate fertilizer.</p>

Semester	Course Code [CEM-G]	Course Outcomes
SEM 6	DSE (B)	<p>DSE B-1. Green Chemistry And Chemistry Of Natural Products</p> <p>CO 1. Students of undergraduate course are continuously being introduced and encouraged about the different possibilities in this field. It helps students to think and perform to design and develop environmentally benign methods for organic synthesis.</p> <p>CO 2. To know about the examples of green reactions and future trends in green reaction.</p> <p>CO 3. To learn how to perform green synthesis of a number of organic compounds in the laboratory.</p> <p>DSE B-2. Analytical Methods In Chemistry</p> <p>CO 1. Helps to learn about different analytical methods (Flame Atomic Absorption and Emission Spectrometry, Thermogravimetry, pH metric, Potentiometric and Conductometric Titrations) to identify and separate the products formed during different chemical transformations.</p> <p>CO 2. To study the fundamental laws of spectroscopy and selection rules.</p> <p>CO 3. To learn the methods of separation of stereoisomers by spectral, chemical and chromatographic data analysis (IC, GLC, GPC, TLC and HPLC).</p> <p>CO 4. To study experimentally how to separate and identify a mixture of monosaccharides by chromatography method.</p> <p>CO 5. To learn experimentally how to separate a mixture of ions by solvent extraction technique; determination of pH of soil and estimation of Ca, Mg and phosphate ion in soil.</p> <p>CO 6. To determine the pKa values of an indicator, COD and BOD using spectrophotometry.</p>

Department of PHYSICS (UG)

Programme Specific Outcome (PSO)

1. Physics deals with wide variety of systems that is to be tested both theoretically and experimentally. The subject needs proper blending of both theory and experiment. Each theories needs to be tested experimentally and the varieties of experimental facts needs proper explanation from its theoretical viewpoint. Physics uses mathematics to organize and formulate experimental results. From those results new predictions can be made or a theory can be ruled out. Computational physics is playing a vital role in this regard. The students need proper understanding of the different aspects of physical theories and experimental techniques so that they can apply those techniques in the upcoming advanced courses when they have finished their UG 3 year syllabus.
2. Students are expected to acquire knowledge in physics, including the major disciplines of classical mechanics, quantum mechanics, electromagnetic theory, electronics, optics, special theory of relativity and modern physics. They must have a proper understanding of programming so that they can apply appropriate scientific programming skills wherever necessary.
3. Students should have the skill of identifying the key factors and applying appropriate principles and assumptions in the formulation of physical problems.
4. Students should learn how to design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes. Not only that they are expected to have an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data.
5. Students will realize and develop an understanding of the impact of physics and science on society.
6. Students are also expected to develop written and oral communication skills in communicating physics-related topics.
7. Apply conceptual understanding of the physics to general real-world situations.
8. Discover physics concepts in other major disciplines such as mathematics, computer science, engineering, and chemistry.
9. After the completion of program, students will be able to have in-depth knowledge of basic concepts in physics.
10. Students will be able to apply the laws of physics in real life situations to solve the problems.
11. Student develop attitude of doing research through undertaking small projects.
12. Student will have set his foundation to pursue higher education in physics.
13. After completing the program student will have developed interdisciplinary approach and can pursue higher studies in subjects other than physics.

Course Outcomes (CO)

Course Outcomes (COs) – PHYSICS (General) (CBCS)

Semester	Course Code	Course Name	Course Outcomes (COs)
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I	PHS-G- CC-1-1-TH	Mechanics (Theory)	The students will acquire the knowledge of vector algebra, Newton's Laws of Motion, Gravitation, Oscillation, General Properties of Matter etc. which play very important roles in the basic sciences. This course will help the students to enhance the understanding of motion of objects under different conditions. This course will be the basic foundation for the students to carry on higher studies in interdisciplinary fields.
	PHS-G-CC-1-1-P	Mechanics (Practical)	In this laboratory course, the students will learn the verification of some known parameters like acceleration due to gravity, the time period of a pendulum,

			determination of moment of inertia of rotating objects and determination of some elastic constants of matter.
II	PHS-G- CC-2-2-TH	Electricity and Magnetism (Theory)	The students will learn the topics Electrostatics, Magnetism and Electrodynamics which are very basic foundations in physics.
	PHS-G-CC-2-2-P	Electricity and Magnetism (Practical)	The students will get familiar with basic instruments like Carey Foster Bridge, Potentiometer, Ammeter, Voltmeter, Magnetometer etc. and their uses. The student will learn to measure some basic physical quantities like resistance, current, magnetic field components etc. in the laboratory.
III	PHS-G- CC-3-3-TH	Thermal Physics and Statistical Mechanics (Theory)	This course will pave the way for the students to understand the basic phenomena of nature governed by the various laws of Thermodynamics. The other aspects like kinetic theory of gas, the distribution of radiation energy are also covered in this course. The course is further extended to understand Statistical Mechanics which is relevant to study Thermodynamics analytically.
	PHS-G- CC-3-3-P	Thermal Physics and Statistical Mechanics (Practical)	The students will get hands-on training for determination of different physical quantities of thermal physics like coefficients of expansion, pressure coefficients, thermal coefficients of resistance, thermal conductivity etc. and they will also verify very important Stefan's law of radiation.
IV	PHS-G- CC-4-4-TH	Waves and Optics (Theory)	This course will introduce another important branch of Classical Physics. The students will get refreshed through the recapitulation of the basic preliminary aspects of vibration. The basic mathematical tools for analysis of vibration & wave motion will be introduced. The various aspects of Interference, Diffraction and Polarization will be studied extensively using the wave concept of light.
	PHS-G- CC-4-4-P	Waves and Optics (Practical)	This laboratory course will give the students the methodologies of determination of optical parameters like focal length, radius of curvature of a lens. The students will also study other optical phenomena like the interference patterns, rotation of plane of

			polarization by active substance.
V	PHS-G-DSE-A1-TH	Electronics and Instrumentation (Theory)	This course will build the foundation of the fascinating world of electronics which has application in every sphere of modern civilization. We can't think of a world without electronics.
	PHS-G-DSE-A1-P	Electronics and Instrumentation (Practical)	The students will go through this laboratory work very extensively and become familiar with the electronic experiments. The course is exhaustive and hence the students will learn and develop a good command to handle the electronic components and their applications. A number of experiments on analogue and digital electronics are incorporated in this practical course.
	PHS-G-DSE-A2-TH	Modern Physics (Theory+Tutorial)	In this course the students will learn fundamental and some advanced topics of modern physics and its application. This has a good impact for pursuing research work in renowned institutions in India and abroad.
VI	PHS-G-DSE-B1-TH	Solid State Physics (Theory)	The study of the solid state encompasses the understanding of the organizational, mechanical, magnetic and electrical properties of the substance as well as the forces that bind the units into the solid state. By far the most important subfield of solid state physics in the 20th century is the study of semiconductors and solid state electronics. The syllabus also covers Superconductivity, the ability of certain materials to conduct electric current with practically zero resistance. The study of superconductivity is very important and the superconductors have enormous variety of applications in modern day.
	PHS-G-DSE-B1-P	Solid State Physics (Practical)	All the Experiments of this course are related to investigation of fundamental and electrical and magnetic properties of solids.
	PHS-G-DSE-B2-TH	Nuclear and Particle Physics (Theory and Tutorial)	In this course the students will learn fundamental and some advanced topics of nuclear physics and its application. This has a good impact for pursuing research work in renowned institutions in India and abroad.
SEC-A1	PHS-SEC-	Basic Progmming and scientific Word	This is a very useful course of learning of computer language: FORTRAN/ C and

	A1-TH	Processing (Theory)	Word Processing. This course has wide applications in academics, computational work and industry.
SEC-A2	PHS-SEC-A2-TH	Electrical Circuits and Network skills (Theory)	The course part helps the students to enhance the skill in Electrical Circuits and Network which has wider application in real world.
SEC-B1	PHS-SEC-B1-TH	Computer Algebra System and Figure drawing skill (Theory)	This course will enhance the computational skill of the students. This course has immense applications in the research field.
SEC-B2	PHS-SEC-B2-TH	Renewable Energy and Energy Harvesting (Theory)	This course is very important and useful for the students. It will enable the students to know about the various Renewable Energy sources and Energy Harvesting techniques and their applications.

B.VOC in **BANKING, FINANCIAL SERVICES AND INSURANCE (UGC)**

Program Outcomes:

- Skills in Banking & Financial Services.
- Skills in Mutual Funds, stock markets, Chit funds, Micro Finance, etc.
- Skills in computer profession i.e. MS Office, MIS, Accounting packages, Data base etc.
- Skills in banking related services.
- Awareness about banking activities and banking to customers

Course Relevance:

BFSI sector in India is valued at Rs. 81 trillion and is likely to become fifth largest in the world by the year 2020 and third largest by the year 2025. Banking, Financial Services and Insurance (BFSI) is set to grow exponentially in India due to the rising per capita income, the introduction of new products, innovation in technology, expanding distribution, networking and increasing customer awareness of financial products.

The demand of skilled professionals in this sector is ever increasing. After completion of B.Voc in Banking Finance and Insurance, one can find a job in sectors like

- Core banking
- Retail banking
- Private banking
- Corporate banking
- Investment banking
- Credit cards
- Stock– broking
- Payment gateways
- Mutual funds
- Life and general insurance

Aspirants can perform the role of insurance agents, bank and financial product sales executive, equity product sales executive, investment representatives and stockbrokers in different banking, finance and insurance companies.

TOTAL DURATION OF COURSE: 3 Years

- ✓ After completion of Year– 1 Diploma is awarded.
- ✓ After completion of Year– 2 Advance Diploma is awarded.
- ✓ After completion of Year– 3 B.VOC Degree is awarded.

B.Voc Degree Programme in Hospitality and Tourism (UGC)

Regulations, Scheme and Syllabus for B.Voc Tourism and Hospitality

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc. programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge

The proposed vocational programme in Hospitality and Tourism will be a judicious mix of skills, professional education related to Tourism and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Hospitality and Tourism environment

ELIGIBILITY FOR ADMISSION

Eligibility for admissions and reservation of seats for B.Voc Hospitality and Tourism Industry shall be according to the rules framed by the Institute from time to time. No student shall be eligible for admission to B.Voc in Hospitality and Tourism unless he/she

has passed the Plus Two of the Higher Secondary Board of West Bengal or that of any other university or Board of Examinations in any state recognized as equivalent to the Plus Two of the Higher Secondary Board in West Bengal. However SC/ST, OBC, and other eligible communities shall be given relaxation as per University rules.(Those who passed Vocational Higher Secondary course will get a weightage of 25 marks.)

CURRICULUM

The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components.

DURATION

The duration of the B. Voc in Hospitality and Tourism shall be three years consisting of six semesters. The duration of each semester shall be five months inclusive of the days of examinations. There shall be at least 90 working days in a semester and a minimum 450 hours of instruction in a semester.

PROGRAMME STRUCTURE

- The B.Voc Tourism shall include:
- Language courses
- General Education Components
- Skill Components
- Project
- Internship
- Industrial Training
- Familiarisation Trips
- Soft Skills and Personality Development Programmes
- Study tours

CREDIT CALCULATION

The following formula is used for conversion of time into credit hours.

- One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops/labs and tutorials;
- For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

PROGRAMME OUTCOMES

PO 1 : Become knowledgeable in the subject of Hospitality Management and apply the principles of the same to the needs of the Employer / Institution /own Business or Enterprise.

PO 2 : Gain Analytical skills in the field/area of Hotel and Food service industry.

PO 3 : Understand and appreciate professional ethics, community living and Nation Building initiatives.

PO 4 : Integrated Theory and Practical knowledge towards skill development.

PO 5 : Training in all sectors of Hospitality industry to have a wide exposure.

PO 6 : To create employability to the students at different levels during their course of study.

PO 7 : Focus towards development of multi-skilled professionals in the competitive Hospitality environment.

PROGRAMME SPECIFIC OUTCOME

PSO 1 : Apply the knowledge of Hotel Operations and Training skills in the domain of Hospitality Management.

PSO: Solve the complex problems in the field of Hospitality Management with an understanding of the societal, legal and cultural

impacts of the solution.

PSO 3 :More exposure on practical skills, enhanced with continuous outdoor exposureand industrial training.

PSO 4 : Form a part of member in a team with right attitudes

TOTAL DURATION OF COURSE: 3 Years

- ✓ After completion of Year– 1 Diploma is awarded.
- ✓ After completion of Year– 2 Advance Diploma is awarded.
- ✓ After completion of Year– 3 B.VOC Degree is awarded.