DURGAPUR WOMEN'S COLLEGE

BENGALI DEPARTMENT

Programme Outcome	B. A. Bengali Literature
	Developing intellectual, personal and professional abilities through effective communication skills, ensuring high standard of behavioural attitude through literary Subjects and shaping the students as socially responsible citizens with high moral philosophy.

Programme Specific Outcome

On successful completion of the programme, the students will be accurate both in verbal and written communication as they will be strong in usage of appropriate Grammar and their usage to master the art of linguistic proficiency.
They can express a thorough command of Mother Language, Bengali and its wide variety of linguistic structures.
They can apply the critical frameworks to analyse the linguistic, cultural and historical background of texts written in Bengali.
They will be familiar with the connections of diverse textual genres including fiction, non – fiction, poetry, autobiography, biography, journal, film, plays editorials etc.
Students will be able to gain sound socio-economic and cultural knowledge of different periods as depicted in the texts(Old – Modern)
Students will be able to compare and comprehend different processes, modes of thought from different areas within Bengali literature through the different articulations voiced by various contemporaries
Students will be able to recognize and articulate the diversity of human experience, including ethnicity, race, language, gender as well as political, economic, social and cultural structures over time and space.

Course Outcome :

Bengali Literature	To acquire sound comprehension of and be able to dissect and proactively debate the widespread angles of literary, social, cultural, biographical and historical background of greatest writings and scripts in Bengali literature.

Course Outcome, Programme Outcome and Programme Specific Outcome for the Department of English

The Department of English at present offers the BA Hons course in English along with English as a Generic Elective and MIL subject-option for interested students. At present ,the Department does not offer BA Program in English, but students taking admission in the Program course might opt for English as their second discipline subject.

Programme Outcome of BA Honours in English—The Bachelor of Arts in English Programme has been designed by the affiliating University following the guidelines of the UGC regarding the Choice Based Credit System. It is meant to acquaint the students with the past and present of English literature, society, and culture and also traces the cultural legacies that this vast and diverse body of literature has both left and imbibed. This course not only familiarizes the students with literary and cultural texts originally written in English but also includes translated texts from various European and Indian literatures and broadens the scope of the term "English Literature". The Core Courses are compulsory papers arranged chronologically and/ or according to literary genre and subtypes whereas the Discipline Specific Elective Courses are chosen out of a pool of such courses. The Skill Enhancement Courses focus on various skill sets and attempt to hone them so that it increases the employability of the students once they successfully complete their Graduation. The course-specific outcomes are as follows-

BA Hons in English

CC-1

BAHENGC101British Poetry: Anglo-Saxon to Seventeenth Century

[Credit-6]

Course Type:	Course Details: **CC-1**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The opening course of English Honours deals with British poetry from Anglo-Saxon to Seventeenth Century. It is useful to students concerned with English literature in multifarious ways. Poetry gives students a healthy outlet for surging emotions. The first unit enhances their knowledge on particular aspects of the literary history of British poetry, its socio-economic background, and development from its Anglo-Saxon beginnings to the Seventeenth Century through milestones like Chaucer's works, the Renaissance, Puritanism, and the Civil War. A selection of an entire range of representative works of major poets of this span comprises the second unit. It seeks to exploit the advantages of a broadly based interdisciplinary approach towards British poetry. An exploration of the poems helps gain an idea of the development of

literary conventions of British poetry through the ages, with relation to history and culture. The mystifying nature of the poems, resisting easy interpretation, offers the graduating learners an opportunity for achievement in analysis and critical reasoning. The last unit provides important information about the basics of Rhetoric and Prosody, mentoring students to appreciate poetry beyond a sentence's literal word meaning.

CC- 2

BAHENGC 102 British Prose and Drama: Anglo-Saxon to Seventeenth Century [Credit-6]

Course Type:	Course Details: **CC-2**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The paper is divided into three units with reference to the literary genres of prose and drama that were produced between the Anglo-Saxon Period and the Seventeenth Century.
Unit I of the paper incorporates the elements related to the Socio-Literary elements of the aforementioned period in focus. It has discussions on the origin and development of British Prose and Drama and the role of the growth of the Press. It also focuses on the literary growth and impact of the University Wits and the growth of the Revenge Tradition in Drama as also the growth of the Comedy of Manners and the Comedy of Humours. It is hoped that through this discussion as part of the learning outcome the students would be able to have an in-depth overview of the socio-literary aspects of this era which in turn would help the students to move forward in their study of English Literature in the future.
Unit II of the paper has two representative components related to British Prose and includes the texts of three of Francis Bacon's essays and Aphra Behn's "*Oroonoko*". As part of the learning outcome, it is hoped that the study of these texts would initiate the students towards the flavours of British Prose and would in turn help them later on when they shall be either dealing with a variety of essays or non-fiction works.

GEC-1: For Honours disciplines other than English

BAHENGGE 101 Contemporary India: Women and Empowerment

[Credit-6]

Course Type:	Course Details: **GEC-1**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course provides a basic understanding of Gender, it will discuss the concepts of Masculinity, Femininity, Patriarchy, Feminism, LGBTQ, etc. The next half of the course will discuss issues such as the Women and Nationalist Movement in India, Women and Partition,

Women and Law, Women and Violence, etc with special reference to the texts of Kamala Das, Mamta Kalia, and Mahasweta Devi.
It is hoped that the students shall have working knowledge on the concept of gender and its various inter-links. Also, the students shall be able to have an idea of the various movements that have gone into building up the concept of gender. Later, the students might be able to tackle as learning outcomes the texts related to such issues.

CC-3

BAHENGC201 Shakespeare [Credit-6]

Course Type:	Course Details: **CC-3**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The paper wishes to introduce to the students the works of William Shakespeare and equip the students with sonnet writing and the plays of Shakespeare. It is hoped that by studying these texts the students shall be able to bring about a qualitative approach in the understanding of Shakespearean plays. At the same time, this syllabus wishes to link up the students with the other plays of Shakespeare which shall be studied in the M.A. course**.**

CC-4

BAHENGC202 British Literature: Eighteenth-Century [Credit-6]

Course Type:	Course Details: **CC-4**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper focuses on the growth of literature in the context of 18th Century British life and ethos. It brings together the different changes that took place in England both socially and sociologically and also creates an awareness among the students regarding this critical phase of British history. The growth of various literary genres shall be dealt with and so hopefully shall create a larger understanding of British literature.
Unit I, as usual, holds out to the students the background of the Age and it is hoped that by studying this section the students shall become equipped with the Neo-Classical Age and understand better the positioning of the literary output of the Age.
Units II and **III** on the other hand bring to the students the cross-sectional representation of the literary texts of the Age. It is hoped that by studying these texts the students shall be able to connect the literary texts and their nuances with the Age when they were written.

GEC-2 For Honours disciplines other than English.

BAHENGGE201 Indian English Literature [Credit-6]

Course Type:	Course Details: **GEC-2**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

Since this course is for students who do not have English as their Core subject, therefore this paper aims to give a taste of Indian English Literature to the students. It is hoped that at the end of the course the students shall have a working knowledge of Indian English literature as part of their academic enhancement.
This paper has two units. **Unit I** brings to the students the flavours of Indian English Poetry, mostly written during the post-Independence era. It is hoped that by studying this section the students shall become better acquainted with Indian English Poetry which made remarkable progress during this period.
Unit II brings to the students a representative work of one of India's greatest novelists, R.K. Narayan. It is hoped that by studying this text the students shall be able to understand Indian culture and the "Indianness of India' much better.

AECC-2 English/MIL Communication
AECCE201 English Communication [Credit-4]

Course Type:	Course Details: **AECC-2**			L-T-P: 4 - 0 - 0	
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is for all students who pursue a course in any Honours subject. It is hoped that this paper shall provide a working knowledge of communication in English both through theoretical knowledge and in terms of writing skills.

CC-5
BAHENGC301 British Romantic Literature [Credit-6]

Course Type:	Course Details: **CC-5**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The primary learning outcome of this paper is to educate students on the contexts of the English literary tradition in the Romantic Period in terms of its social, philosophical, intellectual, literary backgrounds. Students are expected to develop a clear understanding of Romanticism, Fancy and Imagination, Supernaturalism, etc that provide the basis for the texts. A study of the

French Revolution or the significance of *Lyrical Ballads* will develop skills to analyse the sensibility of the British Romantic period – common man, equality, freedom, sense of community, and fraternity. The student is expected to gain an understanding of the process of literary development through admiration of canonical and representative poems and prose of the writers of the Romantic period like Wordsworth's *Tintern Abbey* or Jane Austen's *Pride and Prejudice*. The paper promotes proficiency of critical analysis and interpretation of selected Romantic texts in terms of theme, language, and design.

CC-6

BAHENGC302 British Literature: Nineteenth-Century – Victorian [Credit- 6]

Course Type:	Course Details: **CC-6**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper enlightens students with the major socio-economic changes like industrialization, urbanization, and confrontation of Darwin's Theory of Evolution, as it develops in the Victorian Age, the influence of which the nineteenth-century poems and novels were unable to escape. A study of the social and literary history of the Victorian world like the Industrial Revolution, the Reform Laws, or the Pre-Raphaelite Movement, will assist in identifying the socio-economic-political contexts that inform the literature of the period. Students will here come across the poetry that is characteristic of the Victorian period – structures like the dramatic monologue – *My Last Duchess* of Robert Browning, a celebration of the Victorian temper of high spirit, energy and resolution in Tennyson's *Ulysses*, poems expressing 'Crisis of Faith' like Matthew Arnold's *Dover Beach*, etc. Students will also discover how the novel grew and experimented with plot, character, and perspective through the reading of such representative examples of realistic Victorian fiction as Dickens' *Hard Times* or Hardy's *The Return of the Native*. Students will decipher how Victorian novels closely followed not only the social concerns of the period like factory life and the condition of workers but was also linked with the expansion of Colonialism and Capitalism.

CC-7

BAHENGC303 Classical Literature: Indian and European [Credit- 6]

Course Type:	Course Details: **CC-7**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The students are introduced to a rich and diverse literature through the exploration of Indian and European classical texts in English translation. The knowledge of the eco-socio-political-cultural context of the age that produced the texts enables the students to historically situate the classical literature and diverse literary cultures from India and Europe. *Natyashastra* and

Poetics enable us to explore the central concerns of Sanskrit drama and dramatic theory respectively. They lay a foundation in Indian and European poetics, theories of representation, aesthetics, aspects of theatre, etc. Selections from Ilango's *Cilapattikaram*, *Mrichchhakatika* of Sudraka, Homer's *The Iliad*, and Sophocles' *Oedipus Rex* introduce students to multiple genres and forms, offering a wide-ranging perspective on the artistic, philosophical, and social concerns of classical literature. The paper teaches how to develop the ability to pursue research in the field of classics. Now he/ she can appreciate the pluralistic and inclusive nature of Indian and European classical literature and their attributes along with valuing cross-cultural aesthetics.

GEC-3(For students other than Hons. In English)
BAHENGGE301 Literature and Gender [Credit-6]

Course Type:	Course Details: **GEC-3**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The course aims to help students from non-English literature backgrounds to develop a vital understanding of how discourses and assumptions of gender govern and carve our very lives, experiences, emotions, and choices. The course exposes students to an extensive range of literary and textual materials from diverse historical periods and contexts so that they are able to investigate the socially-constructed nature of gendering. It will introduce students to the major critical approaches to literature that feminist theorists have devised to understand 'woman' as a single or variable entity in literature. The concept of gender as a cultural category – ideologies such as feminisms, masculinities, and transgenderism – will make students perceive the complexity of social and biological constructions of manhood and womanhood and how it is constructed in literature. Knowledge of the astonishing range of feminism in the literature of all ages and cultures along with the ways in which they embody a politics of resistance is offered through writings of Begum Rokeya, Mahasweta Devi, Virginia Woolf, and Sylvia Plath. There can be no better representation of female experience in literature than in such representative texts as *The Degradation of Women* or *A Room of One's Own* or poems of Plath. This course sensitizes students to gender assumptions in literary texts facilitating comprehension of the link between the status of women to social discrimination and social change. The learners will explore issues of women's experience, women's work, selfhood, and representation in the texts prescribed.

SEC –I (For English Honours students)

BAHENGSE301 Actual Reporting and Content Writing[Credit-4]

Course Type:	Course Details: **SEC-1**			L-T-P: 4 - 0 - 0	
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course is aimed to help undergraduate students develop and explore composition, argument, and writing skills that will train them to improve their composing abilities for higher studies and professional endeavours. The perception of Actual Reporting will help students understand and draft different types of Newspaper/ Television / Organization Reporting. Understanding of Content Writing like Advertisements, Leaflets, Brochures, Posters, Web Blogs will benefit in catering to the crucial necessities of modern life. The dexterity or skill of putting to words one's ideas and thoughts to the target audience and effectively communicating one's findings will be mastered through this paper.

BAHENGSE302Translation Skills [Credit-4]
(For English Honours students)

Course Type:	Course Details: **SEC-1**			L-T-P: 4 - 0 - 0	
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course has the objective of developing competency to critically appreciate the process of translation in a multi-linguistic and multicultural country like India. The basic concepts related to translation will clarify the process, modes, equivalence adopted in the translation. A critical examination of translated literary/non-literary texts like *Thakurmar Jhuli* and William Radice's translation of Tagore's poems aids in assessing, comparing, and reviewing translations. The concept of the politics of translation can be comprehended by students through such meticulous probing into the theory and practice of translation skills.

CC-8
BAHENGC401British Literature: The Early Twentieth Century[Credit-6]

Course Type:	Course Details: **CC-8**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper takes a look at the socio-literary aspects of the early part of the Twentieth century. The various socio-literary and socio-cultural shifts have been discussed in this paper. The paper has been divided into three Units.
Unit I takes a look at the various important socio-historical events that took place in the early part of the 20th century, somewhat like a logical extension of what has been done earlier in the paper related to the Victorian Age. At the same time, this Unit wishes to bring to the students the various Social and Art Movements that took place during this time and then wishes to show to the students as to how these socio-cultural movements influenced the growth of British Literature in the early part of the 20^{th} century. It is hoped that through such discussions on a panoramic course of events the students would have a wider vision of the literary growth of the times and the reasons behind the growth of various literary movements of the Age.

Unit II is almost an extension of Unit I and discusses the major poetic texts of the times by referring to a cross-section of poets. It is hoped that through such knowledge the students would become better equipped to understand the various nuances of poetic writing of the period.
Unit III pores into fiction. It is hoped that the theoretical paradigms of Psychoanalysis and the literary history of the growth of the Stream of Consciousness Novel technique discussed in Unit I would be understood better by reading Virginia Woolf's *Mrs. Dalloway*. At the same time, the students would be enriched by studying the short stories by two other prominent writers of the era Joyce and Conrad.

CC-9
BAHENGC402 Indian Writing in English [Credit-6]

Course Type:	Course Details: **CC-9**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper focuses on the various aspects of the study of Indian Writing in English and hopes to introduce to the students the history of the growth of this literary arena as well as the different phases and genres of the same. As a learning outcome, it is hoped that through the study of this paper the students shall become better acquainted with the field of study and learn to tackle the questions related to culture, race, and identity that Indian Writing in English relates to.
Unit I brings to the students the basic study of the historical survey of the growth of Indian Writing in English. It is hoped that through this study the students shall have a working knowledge of the growth of this genre. Such knowledge shall help them to locate texts and their nuances much better in the other two Units
Unit II is on poetry and the selection of poems chosen to attempt to sensitise the students with the variations of theme and technique that have occurred in this genre both during the colonial and post-colonial phases from Derozio to Ngangom.
Unit III is on fiction and contains two short stories and a novel. Through the study of these texts, it is hoped that the students shall have an insight into the fictional works of some of the most cultivated writers of Indian Writing in English.

CC-10
BAHENGC403 Popular Literature [Credit-6]

Course Type:	Course Details: **CC-10**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper brings to the students the various facets of Popular Literature. It is often thought that popular literature cannot be part of canonical literary syllabi but this paper brings to the students the joys of popular literature.

Unit I brings to the students an overall literary and historical insight into the growth of popular literature. This section hopes to bring to the students the various aspects of Popular Literature and hopes to put into the minds of the students the questions on caste, identity, and gender.
Unit II brings to the students, representative texts of poetry and popular fiction. It is hoped that through the reading of these texts the students shall be able to tackle the various issues associated with the reading of popular literature with critical insights.
Unit III has the prose works of J.K. Rowling, Agatha Christie, and Satyajit Ray and brings to the students some of the best fictional works of the genre. This unit shall help the students to analyse these works with critical insights.

GEC-4(For students other than Hons in English)
BAHENGGE401 Indian Literature [Credit-6]

Course Type:	Course Details: **GEC-4**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is to be taught to Honours students other than those who are pursuing a degree in English. The paper is one of the two options available to the students.
Unit I and **Unit II** bring to the students an entire gamut of fictional and non-fictional works of Indian English, both originally written texts in English and translated texts into English from vernacular languages. Through these two Units, the students shall become aware of the socio-cultural issues of Indian English presented in this paper.

SEC– 2 (For English Honours students only)
BAHENGSE401 Communicative English [Credit-4]

Course Type:	Course Details: **SEC-2**			L-T-P: 4 – 0 – 0	
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper has two options and is for students who are pursuing a degree course in English Honours. The paper aims to provide an enhanced skill-set to the students regarding the usage of English and mostly its non-verbal communication skills.
Unit I is about vocabulary and functional grammar and it is hoped that through this unit, the students shall be able to re-visit the skill-sets that they had primarily learnt in the final years of their school life. As a learning outcome the unit focusses on control over language which can be used concurrently for literature.
Unit II focusses on the enhancement of the skill-sets in writing. The learning outcome shall be on enhancing skills with regard to the writing of circulars, notices, agenda and minutes which will be required in their later professional life.

CC-11

BAHENGC501 Modern European Drama [Credit-6]

Course Type:	Course Details: **CC-11**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course presents students to Twentieth century English and European drama, depicting the crucial role of drama in the introduction and shaping of modernity. The continent of Europe and its literature went through significant changes since the Renaissance. One should note that by the turn of the century, the European avant-garde had thoroughly modified the theatre – which at this juncture, seems to evolve into a pan-European phenomenon, with stylistic/technical innovations and thematic experimentations. The early phase of this period was dominated by realism. The radical turns away from it, soon followed. The study of masterpieces from Norway, Germany, Romania and England will acquaint the students with the European historical and cultural situation in this period and understand concepts like realism, naturalism, symbolism, expressionism, the Avant Garde, the epic theatre etc. The student can get an idea of the transformation, both in the socio-political and the literary fields across different national cultures in Europe by studying the prescribed plays.

CC-12

BAHENGC502 American Literature [Credit-6]

Course Type:	Course Details: **CC-12**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course seeks to introduce students to the distinctive flavour of American Literature along with a broad overview of its historical development and social, cultural and critical contexts. Students will study texts against their socio-historical frameworks. A study of a wide range of poets like Longfellow, Frost, Whitman and Adrienne Rich will make students understand the depth and diversity of American poetry, with reference to the history and culture of the United States of America from the colonial period to the present. The learning experience of a memory play like *The Glass Menagerie,* will relate the African American experience in America to issues of illusions and dreams. Black Women's Writing can be probed into through Morrison's *Beloved*. The chronicle of the life of a Black woman will be studied against the panorama of the destructive legacy of slavery and the dehumanization of the African American community in the United States before and shortly after the Civil War. It will assist to consider the axes of race and gender as essential components of literary production. The students will familiarize themselves with other literary experiments of the period through prose works of Edgar Allan

Poe and O' Henry. Hence a study of the American mind from Indian perspective will enrich the students' learning experience.

DSEC – 1

BAHENGDSE501 Literary Criticism [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5 – 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

This paper introduces students with some of the key ideas and texts of Western literary criticism from Greco-Roman antiquity to the modern period. Students will get familiarized with the intellectual shifts in the reading of culture, language and literature. Thereafter learners can be expected to become conversant with examining the implications of ideas (e.g.mimesis or imagination), and orientations (classicism, romanticism and modernism) that have marked the history of literary criticism. The paper is drafted in such a manner that students get the opportunity to study principal concepts associated with the names of significant thinkers in this history. The paper comprises three parts – Section I dealing with concepts framed by Aristotle and Dr Johnson, Section II with Romantic criticism of Wordsworth and Keats and Section III Modern criticism of T.S. Eliot and Matthew Arnold. A learning of a wide range of literary philosophers and critics, whose works had informed and shaped the discourse of literary criticism, will strengthen the interpretative skills of learners and make it possible to apply various theoretical frameworks and concepts to literary and cultural texts.

DSEC -1

BAHENGDSE502 Indian Literature in Translation [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

Trans linguistic in nature, the course focuses on Indian 'Bhasa' texts that have been translated and adapted in English, and have thereby acquired a new exemplar. The course intends to widen its horizons through recognition of the cultural interanimations and cross fertilization between English and the 'Bhasas'. A study of poems of Kaif Azmi, Nirendranath Chakraborty or Subramania Bharti will promote exploring the space where literary creations between languages, and cultures are revealed. An exploration of Indian subjectivities, histories and politics can be located in the prose fiction of Premchand, Ismat Chugtai and Premendranath Mitra. Ethics being an integral part of the Indian culture, an allegory to the destruction of human lives and wilful blindness to ethical values is presented in Dharamveer Bharti's *AndhaYug*, which will be a happy discovery for learners. The impact of significant literary movements on Indian authors, the politics of translation and the historical trajectories of texts are worth appreciation. Students are given the scope to engage creatively in the cultural heritage of Indian literary tradition as well as develop a grip on the contemporary literary forms and issues. With

the study of this course the students are certainly to get an overall view of the contribution of the notable Indian authors in building the notions of nation and nationalism.

DSEC 2
BAHENGDSE504 Post World War II Literature [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 10

The epoch of modern literature marks the cultivation of avant-garde theory within poetry, novel and theatre, making it self-conscious, and experimental – representative of important trends, critical shifts and formal experimentations. The impact of social-historical-political-economic contexts – along with contemporary philosophy, ideas and art movements like expressionism, Marxism, the Absurd etc, reverberate in modern literature post World War II. These enriched innovations, both in form and content, bring out the different facets of human experience and literary technique. Representative texts ranging from poetry of Philip Larkin and Carol Anne Duffy to works of Samuel Beckett and William Golding justify the social-historical-political changes post World War II, marking the end of colonialism and the rise of multiculturalism and postmodernist aesthetics.

CC-13
BAHENGC601 Postcolonial Literatures [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

This paper brings to the students one of most interesting yet chequered phases of post-modernist history, that is, the post-colonial era. The paper brings to the students a reading of the various socio-cultural, socio-political and literary dimensions of the era. On one hand the it is hoped that by studying this paper the students shall be able to understand a part of the theoretical aspects behind the study of Post Colonial Literatures that have taken place in the erstwhile British colonies, while on the other hand the texts incorporated in this paper shall bring about a practical application of the various theoretical paradigms.
Unit I of this paper brings to the students the socio-literary background of the study of Post Colonial Literatures. Keeping in mind the vastness of the topic parts of two important seminal texts have been chosen and certain key areas of the theoretical paradigms are learnt by the students from these texts. It is hoped that these theoretical paradigms shall help the students to progress better when they graduate to their Master degree programs.
Unit II of this paper has Drama and Poetry while Unit III has fiction pertaining to Post Colonial Literatures. By studying these texts it is hoped that the learning of such texts shall enhance the overall orientation of the student and link up with further readings in the M.A. Course.

CC-14
BAHENGC602 Women's Writing [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

This paper introduces the students to the essential features of Women's Writings. It is hoped that overall through such a study the students would be able to understand the basic features arising out of the question of gender. Also, the students shall be sensitized on the theoretical and literary aspects of Women's Writing. This paper can create the very backbone of research orientation of the student.

DSEC-3
BAHENGDSE601 Literary Theory [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

This paper introduces to the students the various nuances of the critical field of Literary Theory. While studying literature today it is almost mandatory to have a critical perspective and a working knowledge of various critical theoretical paradigms is almost the way to move forward. In this context therefore the study of this paper becomes very important. The paper has been framed in such a way so that the following learning outcomes may be realized:

- Having a working knowledge of the various critical literary theories like Marxism, Feminism, Culture Studies etc.
- To create awareness among the students as to how such theories might be implemented in the reading/re-reading of various literary texts.
- To create a bridge with the M.A. course of various Universities as and when the students move forward in life.
- To equip them to handle the writing of dissertations or research papers in future.

DSEC4
BAHENGDSE604 Science Fiction and Detective Literature [Credit-6]

Course Type:	Course Details: **DSE**			L-T-P: 5– 1 – 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical 0	Theoretical 10	Practical 0	Theoretical 40

This paper brings to the students the various configurations of the study of texts of two most interesting sub-genres—Science Fiction and Detective Fiction. While Science Fiction opens the mind of the individual to a world where the scientific and the imaginative cohabit, Detective Fiction takes the readers to a world of intense inquest and involves the sharpness of the individual mind. The study of these areas therefore brings to the students a wide variety of appreciation of literary texts It is hoped that by studying these two sub-genres the students would appreciate the deeper thoughts that are involved while studying these texts and sub-genres.

BA Program in English

BAPENGC101 Rhetoric and Prosody[Credit – 6]

Course Type:	Course Details: **CC-1(1)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

At the very onset, students are made familiar with the art of analysing the language of English from an aesthetic point of view through the study of Rhetoric and Prosody. This intricate and interesting area of study helps them to form basic concepts about prose and verse and analyze the metrical patterns to find the encoded poetic meaning. Knowledge about various Rhetorical devices in speech enables them to use embellished and figurative language which can persuade the audience and achieve the desired impact upon the listener.

MILCE101 Basic English Understanding AEC [Credit – 6]

(Only B.A., B.Com Program students to choose)

Course Type:	Course Details: **MILCE**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This course is designed to enhance the ability of the undergraduate students in understanding the basics of English language and literature through reading, comprehension and writing. Some lucid and interesting prose pieces are included in the course so that the students may develop a taste for appreciating prose literature by coming across such nice examples of different styles of writing. Unseen passages would also be given to them in order to test their ability of comprehension. Besides, they are also to be trained through this course on how to compose formal letters for various official purposes. With the objective as mentioned already, this course as a blending of both literary and non-literary specimens of English would enable the students to get associated with complex compositions in the semesters to follow.

BAPENGC201 Poetry [Credit – 6]

Course Type:	Course Details: **CC-1(2)**			L-T-P: 5 - 1 - 0	
		CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical

Credit:6	Full Marks: 40	0	**10**	0	**40**

This paper is designed to be taught to those candidates who are pursuing Program Course and have chosen English as one of their Core papers.
The paper contains a collection of nine poems representing the cross-section of Poetry in English from the time of Shakespeare to the early part of the 20th century. It offers to the students the flavour of the changes that have taken place in English Poetry down the Ages. It is hoped that through this offering the students would become conversant with the various changes in theme and technicalities of poetry down the ages.

MILCE201English I: English Short Stories and Composition
[Credit – 6]

(Compulsory for all B.A. & B.Com. Program students)

Course Type:	Course Details: **CC-3(2)**			L-T-P: 5 - 1 - 0
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is designed for only those students who belong to B.A. and B.Com (Prog.) Courses. The paper has two parts.
In the first part the students are to study three short stories and it is hoped that through the study of these texts the students would be able to grasp the subtleties of English Short Stories written by some of the best short story writers of world literature written both originally written in English and also translated into English. The pattern of teaching and in the setting of questions would enhance the power of comprehension of students in reading English prose texts and in tackling relevant questions.
The second part of the paper has Report Writing and wishes to train the students in enhancing their writing skills through the practice of writing actual reports on incidents.

AECC-2 English/MIL Communication
AECCE201English Communication [Credit – 4]
(For Both Honours and Program B.A./B.Sc. /B.Com. students to choose)

Course Type:	Course Details**: AECC 2**			L-T-P: 4 - 0 - 0
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is to be studied by all students pursuing Program Courses in Arts, Commerce and science as an Elective Language Paper. The philosophy behind teaching this paper is to enhance the Communication skills in English of the learners. However, taking into consideration the infrastructure available in Colleges, the stress in this paper is on the development of written communication. This paper is divided into two Units.

Unit I is in the modes of communication and it is hoped that through this unit the students would become aware about the various modes and types of Communication
Unit II has practical manifestations of Unit I and it is hoped that through the Unit the students would become not only aware about the types of communication but also would become proficient in the various modes of written and verbal communication.

AECC-2 English/MIL Communication

AECCE201English Communication [Credit – 4]

(For Both Honours and Program B.A./B.Sc. /B.Com. students to choose)

Course Type:	Course Details**: AECC 2**			L-T-P: 4 - 0 - 0	
Credit:4	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is to be studied by all students pursuing Program Courses in Arts, Commerce and science as an Elective Language Paper. The philosophy behind teaching this paper is to enhance the Communication skills in English of the learners. However, taking into consideration the infrastructure available in Colleges, the stress in this paper is on the development of written communication. This paper is divided into two Units.
Unit I is in the modes of communication and it is hoped that through this unit the students would become aware about the various modes and types of Communication
Unit II has practical manifestations of Unit I and it is hoped that through the Unit the students would become not only aware about the types of communication but also would become proficient in the various modes of written and verbal communication.

Unit I:
Types and Modes of Communication:
Verbal and Non-Verbal Communication
Personal, Social, and Business Communication
Group Communication
Effective Communication and Miscommunication
The basic concepts of the above should be discussed in the class.

(Five questions of 2 marks each to be attempted out of eight: 2x5 = 10)

Unit II:
Dialogue and Monologue
Group Discussion
Interview
Public Speech
Students should be engaged in practice-sessions and should be made aware of the basic techniques.
(Two short answer type questions of 5 marks each to be attempted out of three: 5x2=10)

Recommended Readings for Unit I and II:

1. ***Fluency in English*- Part II, Oxford University Press,2006.**

2. ***Business English*, Pearson, 2008.**
3. ***Language through Literature and Creativity*, Orient Blackswan, 2013.**

Unit III:
Passage for Comprehension (Unseen)
Exercises: Comprehension

A. Summary, Paraphrasing
B. Vocabulary Test

(Five questions of 1 mark each to be attempted out of eight: 1x5= 5
One short answer type question of 5 marks to be attempted out of two:5x1= 5
One question of 10 marks to be attempted out of three: 10x1= 10)
Internal Assessment: 10 marks
(Five short answer type questions of 2 marks each to be attempted out of eight: 2x 5= 10)

Semester III

BAPENGC301 Fiction and Short Stories [Credit – 6]

Course Type:	Course Details: **CC-1(3)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

Narrative texts use language to recreate experience and provide the student an opportunity to read and respond to representations of issues in contemporary life. Reading a short story or fiction serves to identify themes, plot, structure, characterisation and narrative voice. The manner in which fiction and short story uses literary devices can also be deciphered. The selection of texts is aimed to present themes and topics that are thought-provoking, insightful and informative. Such finely crafted short stories as Mansfield's *The Fly* or Maugham's *Lotus Eaters* are real pleasures in reading where distilling the true essence of plot and character is a gratifying challenge for students. One of the best known of the Sherlock Holmes novels, ***The Hound of the Baskervilles***, is an all-time classic mystery. Such reading will engage the learners with the social and historical construction of crime along with the philosophical, psychological and social issues that are intrinsic part of fiction in general.

MILCE301 British Poetry [Credit – 6]

(Only B.A., B.Com Program students to choose)

Course Type:	Course Details: **CC-3(3)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

The B.A. Alternative English Course, designed for Program students, offers a representative selection of British Poetry. Through these texts, students get familiarized with great ideas, issues of social and cultural concern and also acquire a facility with the English language. Poetic texts of Sidney, Milton, Wordsworth, Hardy and Hopkins, where language is used in clear and striking ways, will teach students how poetic language can help them attain brevity, clarity, insight and complexity in verbal and written expression. Reading poetry to identify tone, imagery, rhythm, rhyme and use of tropes will build up argumentative interpretative capacity. The powerful healing quality of poetry, the ability of poetry to develop a connection with the reader, the improvement brought about in vocabulary and verbal dexterity through reading poems and none the less the sparkling of imagination, abstract thinking, art and creativity – are added incentives for the learners in this paper.

BAPENGC401 Bhasa Literature [Credit – 6]

Course Type:	Course Details: **CC-1(4)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is to be learnt by those students who are pursuing a degree of the Program Course and who have chosen English as one of their core subjects. The focus of this paper is on presenting to the students the richness of vernacular literature or Bhasa Literature which is to be read in translation. The paper has two units and it is hoped that through these two units, the learners shall have an insight into the varied cultural richness and diversity of the country.

Unit I is on poetry and brings to the students not only poetry originally written in English by Kamala Das but also the translated works of such greats as Ghalib and Tagore. The learning outcome of this unit shall be to understand the variations of themes and symbols in poetry in the Indian context.

Unit II is on Bhasa non-fiction and the learning outcome is the presentation of non-fiction work to Indian students in the Indian context.

MILCE401 English II: Appreciating Poetry AECC – IV

[Credit – 6]

(Compulsory for all B.A. & B.Com. Program students)

Course Type:	Course Details: **CC-3(4)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper is to be compulsorily studied by all students who are pursuing a degree in Commerce and Arts as part of the Program Course. The paper has only one composite unit on British Poetry from Shakespeare to Arnold. It is hoped that through this paper the learning outcome for such students shall be the cultivating of the basic knowledge and appreciation of poetry.

BAPENGDSE501: English Literature and Gender [Credit – 6]

Course Type:	Course Details:**DSEC 1(1)**			L-T-P: 5 - 1 - 0	
		CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical

Credit:6	Full Marks: 40	0	**10**	0	**40**

Gender is a defining facet of individual identity. In the present century, notions concerning gender have emerged as some of the important literary themes. The course demonstrates the relevance of gender issues to the study of literature. The possibilities offered by social gender and biological sex in terms of new ways of life, self-esteem etc are explored by female and male authors in their literary creations. Poems by Kamala Das and Sylvia Plath will help examining how literature influences the cultural and social construction of gender, through the experiences and contributions of men and especially women to society. Through an analysis of prose pieces by Begum Rokeya and Virginia Woolf, students will gain understanding of respective cultural conditions from the standpoint of gender theory. The paper intends to take the students through the various configurations and reconfigurations that decide gendered classifications such as masculinity and femininity. The study of this curriculum thus serves the study of power relationships—of how one's gender, typically the male gender, gives one a power advantage over the other. The students develop awareness of the fragile state of gender equality.

Generic Elective

BAPENGGE502 Film and Literature [Credit – 6]

Course Type:	Course Details: **GEC-1**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper will engage students from non-English studies backgrounds to analyse the language of the expressive art of cinema. Students are introduced to film theory, narrative techniques and the language of cinema through various terms and concepts related to screenplay, camerawork, sound, editing like jump, cut, parallel cinema, montage etc. Texts written by great film personalities like Satyajit Ray and Charlie Chaplin will prove insightful for prospective film makers amidst students. The relationship between text and film as well as the distinction between literary and cinematic arts is best understood through the language of film via recognition of its specific features as a medium. In 'Film as Text' the students, by referring to some key cinematic transformations of classical literary texts like Bibhuti Bhushan Bandyopadhyay and Rays' 'Pather Panchali' and Chaplin's 'Modern Times', will understand the role of literature in the development of cinema and its growing independence from the literary authority.

Generic Elective

BAPENGGE501 English Literature and Social Exclusion[Credit – 6]

Course Type:	Course Details: **GEC-1**			L-T-P: 5 - 1 - 0	
Credit:6		CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

	Full Marks: 40				

Since the twentieth century, new discursive spaces have come up in literary texts from varied contexts in India. Within these texts, the idea of the normative is problematized. The marginal status, whether geographical, caste, gender, disability, or tribal, provide the urgency to interrogate the idea of the normative as well as constitutions of the canon. Such a pressing engagement has recently been part of literary academic analysis as well as syllabus of English departments of Indian universities. This course introduces undergraduate students to perspectives within Indian writing that will acquaint them with experiences of marginalization and social exclusion as well as an inspection of modes of literary stylistics that offer a variation from conventional practice. Students are made to approach literature through the lens of varied identity positions – the story of an awakened but suppressed Dalit consciousness in *Poisoned Bread* or the Dalit points of view, interests, insights and directions that grow out of their experience and their aspirations in Satyanarayana and Susie Tharu's *The Exercise of Freedom: An Introduction* or the voice of marginalized women in a hegemonic male society represented in Mahasweta Devi's *Dhauli*. Such accounts evolve in learners a fresh critical perspective and enable them to explore various forms of literary representations of marginalisation as well as writing from outside. A comprehension of the concept of social exclusion through the prescribed texts grows awareness of the different ways in which literary narratives are shaped and literature acts as a tool to negotiate and interrogate the hegemony.

Unit I

Arjun Dangle (ed.): Selection from *Poisoned Bread*: Introduction only

(One question of 10 marks to be attempted out of three: 10x1 = 10)

Unit II

'Water': poem in *The Exercise of Freedom: An Introduction to Dalit Writing* ed Satyanarayana and Susie Tharu

Mahasweta Devi: Dhauli

Suggested Reading: Mahasweta Devi's "Dhauli" from *Outcast: Four Stories* (Tr.) Sharmishtha Dutta Gupta (Seagull)

(**Five questions of 2 marks each to be attempted out of eight: 2x5 = 10**

One short answer type question of 5 marks to be attempted out of two: 5x1 = 5)

Unit III

"Poisoned Bread" by Bandhu Madhav from *Poisoned Bread* (Ed) by Arjun Dangle
Meena Kandasamy's 'Touch'

(Five questions of 1 mark each to be attempted out of eight : 1x5 = 5

Two short answer type questionsof5 marks each to be attempted out of three: 5x2 = 10)
Internal Assessment: 10

OR

BAPENGGE502 Film and Literature [Credit – 6]

Course Type:	Course Details: **GEC-1**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper will engage students from non-English studies backgrounds to analyse the language of the expressive art of cinema. Students are introduced to film theory, narrative techniques and the language of cinema through various terms and concepts related to screenplay, camerawork, sound, editing like jump, cut, parallel cinema, montage etc. Texts written by great film personalities like Satyajit Ray and Charlie Chaplin will prove insightful for prospective film makers amidst students. The relationship between text and film as well as the distinction between literary and cinematic arts is best understood through the language of film via recognition of its specific features as a medium. In 'Film as Text' the students, by referring to some key cinematic transformations of classical literary texts like Bibhuti Bhushan Bandyopadhyay and Rays' 'Pather Panchali' and Chaplin's 'Modern Times', will understand the role of literature in the development of cinema and its growing independence from the literary authority.

BAPENGDSE602Literature and Philosophical Thoughts [Credit – 6]

Course Type:	Course Details: **DSEC-1(2)**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

This paper looks at the various philosophical thoughts that have guided human civilization and which have influenced the creation of literature. This paper too has been divided into two Units**.**
Unit I takes up two texts by Rabindranath Tagore and the students have to study one of them. It is hoped that through these two essays the students would be able to understand the guiding philosophy of Tagorean education. The non-fictional texts thus serve as a contact point between Tagorean philosophy and literature.
Unit II offers a cross-section of fictional and poetic texts and through their study it is hoped that the students shall be able to understand and tackle the various philosophical notions that guide human life.

Generic Elective

BAPENGGE601 Literature and Myths [Credit – 6]

Course Type:	Course Details: **GEC 2**			L-T-P: 5 - 1 - 0	
Credit:6	Full Marks: 40	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		0	**10**	0	**40**

Myths are an important part of human civilization and bring to us the essence of religious and spiritual thinking in their own way. This paper wishes to create an awareness among the students the role that myths play in our lives and how literature brings to us the re-telling of myths and the lessons that we can learn in our lives through myths.

Unit I offers certain poetic texts that re-tell myths belonging to Greek, Roman and Indian culture. Therefore, these texts which re-tell myths are to be studied as Cultural texts.

Unit II entirely focuses on the *Ramayana* and the various myths that surround one of the greatest epics of human civilization. It is hoped that through the study of these texts the students would become aware of not only the great epic but would understand much better the myths that make the *Ramayana* so compelling.

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
HISTORY	History (Hons) History (Prog)	The discipline of History deals with the past in order to understand the meaning and dynamics of the relationship between cause and effect in the overall development of human societies. Its key feature is its broad range of inquiry, as it is as much concerned with wide perspectives, general explanations, and fundamental questions. The fostering of vibrant and healthy critical debate between differing perspectives, interpretations, and representations of aspects of the	The sole aim of the course is to create a good Historian who would describe the human society and its developments through the way of critical thinking. It would also create a historian who on achieving further higher education would be able to lay the foundation for a better future for the human society by taking knowledge from the past and utilizing them appropriately.	[1] The students shall gain knowledge about the Indian History as well as the International Historiography. [2] The UG Students shall be able to establish themselves for further higher education. [3] The students shall build their opportunities towards several jobs. [4] They will develop the ability of critical thinking which will eventually help them in their research work in future.

		past is the major concern for the under graduate students of history. A critical evaluation of sources and evidence of the past, whether written documentation or oral record needs to be taken into account before interpretation of a particular event of history is made. Thus the student should have a clear understanding of the representation of the past through clear narrative, explanation, and analysis. The courses designed by the faculties have the liberty of flexible incorporation and reading materials are available in		

		the college library or are circulated by the respective faculties of the courses. **2. Learning Outcome-based Approach to Curriculum Planning in HISTORY:** **For B.A. History Honours** there will be six semesters in the three-year B.A Honours in History. The Curriculum consists of 14 Core Courses (C), 2 Ability Enhancement Compulsory Courses (AECC), 2 Skill Enhancement Courses (SEC) and 4 Discipline Specific Elective (DSE) Courses and 4 Generic		

		Elective (GE) courses [to be taken from the pool of Generic Elective courses]. Each course is of 50 marks. L stands for Lecture Hour, T for Tutorial Hour and P for Practical Hour. **For B.A. History Programme** There will be six semesters in the three-year B.A Program in History. The Curriculum consists of 12 Core Courses (C) of which 4 core courses are to be taken from Discipline 1(the **program in the subject** selected by the candidate); 4 core courses are to be taken from Discipline 2 (any subject other than		

		Discipline 1) and 4 core courses are to be taken from AECC-Core. Apart from these, 2 Generic Elective courses (GE) [to be taken from the pool of Generic Elective courses], 2 Ability Enhancement Compulsory Courses (AECC-Elective), 4 Skill Enhancement courses (SEC) (from the **program in the subject** selected by the candidate) and 2 Discipline Specific Elective courses (DSE) from Discipline-1 and 2 such courses from Discipline-2 are to be taken. Each paper is of 50 marks. L stands for Lecture Hour,		

		T for Tutorial Hour and P for Practical Hour. Under the two Courses of Study, Honours Course and Program Course, there shall be different types of courses.		

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Political Science	B.A (H)	Students learn about the Political Science and gain Knowledge about Politics. Students Learn about Constitution, Political parties, pressure group. They also learn what is constitution and the preamble. Students also gain Knowledge about fundamental Rights and Duties as a citizen of India. They also learn What is the Role and Function of Prime Minister, President ,chief Minister and Cabinet Minister. Students also gain knowledge from this course about Judiciary system of India and the	Students gain Knowledge about Politics and Political system of India as well as USA, UK, China, France. Students Learns National and Inter National Affair Students gain Knowledge of Political Laws and legal awareness of Dowry Prohibition Act ,Consumer Protection Act, Gaining Knowledge about cyber crime that is very relevant now a days.	

		composition and Function of Supreme Court and this court is the Protector of the Constitution and Fundamental Rights.		
				Political Theory (C1) Students learn to analysis what is politics and explain method of approach to politics- Normative, Behavioral, and Feminist. They also gain the concept of basic Knowledge of Democracy, Sovereignty, Liberty, equality, Rights and Laws, Nature of state- Idealist, liberal and neo Liberal.
		.		Comparative Politics(C2) Students learn differences between comparative Government and Comparative Politics. They also gain knowledge political system and Dependency theory
				Political Theory- Socialist Perspective(c3) Students get hold of

				Marxist approach to the study of politics , theory of revolution –Lenin and Mao, Marxian theory of party
				Comparative Constitutional System (C4) Students learn to analysis unitary and federal, parliamentary and presidential constitutional system, they also learn executive, judiciary and legislative system of UK,USA and PRC.
				Western Political Thoughts (C5) Students getting Knowledge about the back ground of Western Political Thought. Aware of Roman Political System and Plato's theory of Justice
				Indian Political Thought(C6 Students getting Knowledge of Political Thought of Kautilya's, Raja Ranmohon Ray, Bankim Chandra ,Rabindrananth, Swaraj

				of Gandhiji and Social Justice of Ambedkar.
		.		Political Sociology(c7) Students learn from this nature of Political Sociology,, political Culture, Political, Social Mobility, Power, Influence, Political parties and Pressure Group.
				Modern Western Political Thought(C8) Students get Hold of Knowledge of Thomas Hobbes, John Locke, Rousseau,Hegel,Karl Marx,Mill, Bentham
				Indian Government and Politics(c9) Students learn Framing of Indian Constitution .They also learn what is constitution and the preamble. Students also gain Knowledge about fundamental Rights and Duties as a citizen of India. They also learn What is the Role and Function of Prime Minister, President ,chief

				Minister and Cabinet Minister. Students also gain knowledge from this course about Judiciary system of India and the composition and Function of Supreme Court and this court is the Protector of the Constitution and Fundamental Rights
	)			Basic Theories of International Relation(C10) Students can learn of basic theories of International Relations, Foreign Policy, Diplomacy
		.		World Politics (C11) Students gain Knowledge of United Nations, SAARC, ASEAN, Human Rights, Terrorism.
				Basic Theories of Public Administration(C12 Students gain knowledge from this core paper about the nature, scope and scope of Public Administration. They also learn about

				Bureaucracy, Development Administration and Decision making model.
		.		Local Governance in West Bengal(C13 Students learn about Rural and Urban local Government of West Bengal. Structure and Function of Panchayati Raj Institution and Municipal Corporation. They learn about empowerment of women .
				Project C14 Student can gain knowledge from this how to write a research Project and what are the various step to write a research Proposal .This will help them in near future to write a proper research proposal in Higher studies like M. Phil, Ph.D. or any other research field. It will help them to write a proper bibliography and help them to become a successful researcher.
				Democratic

				Awareness with Legal Literacy –SEC-1 students to gain knowledge about Constitution, Laws relating to dowry, sexual harassment, violence against women, laws relating to consumer Rights, cyber Crime, Anti terrorist laws.
				Legislative Practices and Procedures – SEC2 Students gain Knowledge deeply about the Powers and function s of MLA, M.P. They learn about the law making process, Budget Process.
		.		Human Rights: Theory and Practice- DSE1 Students learn about meaning of Human Rights, how to protect human rights in Indian Constitution, Human Rights movements

				Social Movements in Contemporary India DSE-2 Students learn about meaning and nature of social movements like- Telengana, Singur, Chipko, Narmada Bachao, Silent Velley.

2018-2019

BA Sanskrit (Honours)

Programme Outcome:

Sanskrit is a very rich language of IE language group. Sanskrit is a medium to know about ancient Indian history, culture, religion, social life through its text. The academic programme of both Honours and General degree courses are designed not only professional skill but also develop a deep understanding of rich heritage and dynamic prevalent scenario of India through various Sanskrit texts.

Programme Specific Outcomes:

Students will gain knowledge of the major traditions of literatures written in Sanskrit Translation of Sanskrit literature into Bengali and vice-versa. Students acquire ability to apply relevant theoretical perspectives to topics within the field of ancient Indian religion, literature and history So it may be summed up the entire course f Sanskrit honours gives the learners ample opportunity to communicate, translate, corelate with other languages in one way and to enjoy the thesplendor of the language and literature through systematic reading of poetry, drama, grammar, methodologies etc.

Course outcome:

Semester 1

In the first semester two core papers are taught. Core paper 1 deals with Bhattikavyam by Bhartrihari and Kalidas's Raghuvamsham. It may be e said that the learners are expected to learn how to read and enjoy poetry or more specifically Epic poetry. The second paper contains reading of kiratarjuniyam by Bharavi and rhetorical devices of this language called metre.

Semester 2

2nd semester aims at teaching of the richest treasure of Sanskrit literature AbhijñānaSakuntalam by MahakaviKalidasa Another paper teaches the art of writing i.e. what and how an author should write

Semester 3

In sem 3 students are taught the history of Sanskrit literature, general grammar and Siddhantakaumudi that aims at teaching Karaka, an important component of Sanskrit grammar. SEC-1 paper is very important in the sense that it teaches tradition or communication which is normally considered as basic knowledge of at learners language acquisition

Semester 4

In sem 4 also one paper is devoted to teach Samasaprakarana and another for linguistic competence which equips learners with ins and outs of a language. Everyone knows the Veda, the earliest text of the world is very important, so Vedic literature is incorporated with a view to making the learners aware of the life style, rituals, social system of the the Aryan or Vedic people. In SEC-2 gives the students

glimpses of the Karmayoga-the lesson incorporated in the Bhagavad Gita Needless to say it is one of the most comprehensive tests of all literature that gives mankind the knowledge of high moral lesson and helps them find out the right path as Arjuna got it.

Semester 5

In sem 5 two papers named Kavya-prakasha by Mammata and Sahitya-darpan by Viswanatha offer to teach Rhetoric. Other two DSE papers deal with Puranic literature and Patanjala Yoga-darshanam which has recently become part and parcel of many peoples day to day life.

Semester 6

The final semester is almost general one for all categories of avoid readers irrespective of any discipline - History, Philosophy, Economics etc. In this paper Arthashastra by Kautilya and Indian philosophy are taken up. Again in two other DSE papers general discussion follows on Indian Drama and Manusamhita

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Botany	B.Sc. Program	The LOCF for CBCS is designed by UGC and upon successful completion of the programme, the students are enriched with the concepts of classical botany, including the morphology, taxonomy and anatomy of the plants. Besides these, the students become abreast with the latest concepts of plant physiology, biochemistry, ecology, cell biology, molecular biology and genetics. The students also acquire skills in both the theoretical and practical aspects. Field studies are the concepts of teamwork that always complementary the classroom studies.Along these, skill enhancement courses train the students to become self-sufficient for starting	The specific outcomes of the programme are on several dimensions. This type of syllabus enhances the chances for students to progress for higher education like M.Sc., B.Ed. and Ph.D. They have the options to get selected in different courses of Master degree in Biotechnology, Conservation Biology and also in Hospital management. The programme is versatile enough to ensure that students be successful in different competitive examinations.	Semester I: **Phycology and Microbiology (**Develop the understanding on the concept of microbes; Develop critical understanding of viruses; Increase the awareness of human friendly viruses, bacteria, algae and their economic importance.) Semester II: **Mycology andPhytopathology (**Develop the concept to identify true fungi and application of plant pathology in the control of plant diseases; Develop skills in laboratory and field work related to mycology and plant pathology; Identify the common plant diseases according to geographical locations and device control measures.) Semester III: **Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms** (Develop the understanding on the concept of Archegoniatae: Bryophytes, Pteridophytes and Gymnosperms; Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms; Understanding of plant evolution and their transition to land habitat.) SEC 1: **Nursery and Gardening** (Understand the process of sowing seeds in nursery; Analyse the process of Vegetative propagation; Examine the cultivation of different vegetables and growth of plants in nursery and gardening.) Semester IV: **Plant Systematics** (Develop the concept of classification of Plants systematics and recognize the importance of herbarium; Evaluate the importance of herbaria and botanical gardens.) SEC 2: **Biofertilizers** (Develop their understanding on the concept of bio-fertilizer; Develop the concept of integrated management for better crop production by using both nitrogenous and phosphate bio fertilizers and vesicular arbuscular mycorrhizal (VAM).) Semester V: **Anatomy of Angiosperms** (Develop an understanding of concepts and fundamentals of plant anatomy; Develop critical understanding on the evolution of concept of organization of shoot and root apex; Evaluate the adaptive and protective systems of plants.) **Plant Physiology** (Develop an understanding of concepts of water relation of plants with respect to various physiological

		any project combined with floriculture and gardening, mushroom cultivation, cultivation of medicinal plants etc.		processes;Understanding of Photosynthesis, respiration, dormancy and germination in plants; To acquire adequate knowledge about translocation in plants, carbon dioxide concentrating mechanisms, growth regulators and flowering of plants.) SEC 3: **Mushroom culture technology** (Develop the concept of various types and categories of mushrooms; demonstrate various types of mushroom cultivating technologies; develop various types of food technologies associated with mushroom industry.) Semester VI:**Cytogenetics (**Have conceptual understanding of laws of inheritance, genetic basis of loci, alleles and their linkage; Understanding the effect of chromosomal abnormalities in numerical andstructural changes leading to genetic disorders; Analyze the effect of mutations on gene functions and dosage; Examine the structure, function and replication of DNA.) **Plant Ecology and Phytogeagraphy: (**Develop the concept to understand classification of the soils on the basis of physical, chemical and biological components; Evaluate energy sources of ecological system; Assess the adaptation of plants in relation to light, temperature, water, wind and fire.) SEC 4: **Floriculture** (Develop conceptual understanding of gardening from historical perspective; Distinguish among the various ornamental plants and their cultivation; Develop the concept of landscaping of public and commercial places for floriculture; Diagnoses the various diseases and uses of pests for ornamental plants.)

Chemistry Course Outcome

(Honours/Programme/Generic)

Durgapur Women's College

Kazi Nazrul University

Mahatma Gandhi Road Durgapur – 713209

Name of the Department	Name of the Programme	Semester	Paper	Subject	Topics	Outcome
Chemistry	B.Sc (Hons)	I	BSCHCEMC 101	Inorganic- I (Th)	1. Atomic Structure and Nuclear Chemistry 2. Periodic Table and Periodic Properties 3. Chemical Bonding 4. Metallic bonding and Weak chemical forces	Gives comprehensive ideas about the basics of inorganic chemistry, particularly atomic theory of matter, composition of atom and basic idea of chemical bonding which are interesting for the beginners.
			BSCHCEMC 102	Organic -I (Th)	1. Basics of Organic Chemistry 2. Chemistry of Aliphatic Hydrocarbons 3. Chemistry of Aromatic Hydrocarbons 4. Stereochemistry	Gives comprehensive ideas about the basics of organic chemistry, the areas-mechanism and stereochemistry help in developing a sound knowledge about organic chemistry.
Chemistry	B.Sc (GE)	I	BSCHCEMGE101	Basics in Organic and Inorganic Chemistry	1 Atomic Structure 2. Radioactivity 3. Periodic Table and Periodic Properties 4. Functional Nature of Organic Compounds 5. Electron Displacement in Molecules 6. Introduction to Organic Reaction Mechanism	Gives preliminary ideas about the basics of organic and inorganic chemistry. Scientific theory of atoms, concept of wave function, physical and chemical characteristics of elements periodic table and mechanism of organic reactions motivates the enthusiasm of beginners
	B.Sc (Prog.)	I	BSCPCEMC101	Basics in Organic and	1 Atomic Structure	Gives preliminary ideas about the

				Inorganic Chemistry	2. Radioactivity 3. Periodic Table and Periodic Properties 4. Functional Nature of Organic Compounds 5. Electron Displacement in Molecules 6. Introduction to Organic Reaction Mechanism	basics of organic and inorganic chemistry. Scientific theory of atoms, concept of wave function, physical and chemical characteristics of elements periodic table and mechanism of organic reactions motivates the enthusiasm of beginners
Chemistry	B.Sc (Hons)	II	BSCHCEMC201	Physical Chemistry I(Th)	1. Properties of gasI 2. Properties of fluids 3. Properties of Solid 4. Ionic Equilibria	Familiarization with various states of matter which help in developing a sound knowledge about physical chemistry
				Physical Chemistry I(Lab)	1. Surface Tension 2. Viscosity 3. p^H measurement	
			BSCHCEMC202	Organic Chemistry II(Th)	1. Chemistry of Halogenated Hydrocarbons 2. Alcohols, Phenols, Ethers and Epoxides 3. Carbonyl Compounds 4 Carboxylic Acids and their Derivatives	Familiarization about classes of various name reactions, uses of various reagents and the mechanism.
				Organic Chemistry II(Lab)	Qualitative analysis and derivative preparation of organic compounds	
Chemistry	B.Sc (Prog.)	II	BSCPCEMC201	Elementary Physical	1. Kinetic Theory of Gases	Helps to understand kinetic model of

				Chemistry & Organic Chemistry	2. Thermodynamics 3. Stereochemistry	gas and Maxwell distribution, laws of thermodynamics, concepts of calculations of bond energy, 3-D structure of organic molecules
				Organic Qualitative Practical (Lab)	Detection of elements and functional groups	
Chemistry	B.Sc (GE)	II	BSCHCEMGE201	Elementary Physical Chemistry & Organic Chemistry	1. Kinetic Theory of Gases 2. Thermodynamics 3. Stereochemistry	Helps to understand kinetic model of gas and Maxwell distribution, laws of thermodynamics ,concepts of calculations of bond energy, 3-D structure of organic molecules
				Organic Qualitative Practical (Lab)	Detection of elements and functional groups	
Chemistry	B.Sc (Hons)	III	BSCHCEMC301	Inorganic Chemistry – II	1. Coordination Chemistry-I 2. Acids and Bases 3. Chemistry of s and p Block Elements	Concept of coordination compounds, valence bond theory. Basic idea of acid-base strength and properties of s- and p-block elements.
				Inorganic Chemistry – II Lab	Qualitative analysis of acid and basic radicals	
			BSCHCEMC302	Organic Chemistry – III	1. Nitrogen Compounds 2. Heterocyclic Compounds 3. Polynuclear Hydrocarbons 4. Rearrangements, Name Reactions & Organometallics	Knowledge about nitrogen containing functional groups and their reactions in various aspects. Concept of polynuclear hydrocarbons, heterocyclic compounds and organometallic

						compounds.
				Organic Chemistry – III Lab	Identification with general reaction and tests of some selected organic compounds	
			BSCHCEMC303	Physical Chemistry – II	1. Thermodynamics I 2. Chemical Kinetics –I 3. Electrochemistry 4. Interface & Dielectrics	Facilitate the realization of the concept of system, variables, heat, work, and their relations, basic principle of laws of electrochemistry and ion atmosphere, theory and significance of adsorption. Provides practical experience on kinetics and solubility product related experiments
				Physical Chemistry-II Lab	1. Kinetics of decomposition of H_2O_2 by potassium iodide. 2. Solubility/solubility product of Mg-carbonate in presence/absence of common ions and/or neutral electrolytes.	
			BSCHCEMSE301	Industrial Chemistry	1. Paints 2. Electrochemical and Electro-thermal Industries 3. Ceramics 4. Rusting of Iron and Steel 5. Industrial Safety and Fire Protection	Preparation and uses of various compounds including $KMnO_4$, CaC_2, alloy steels etc. Basic concepts of Paints varnishes, dyes, ceramics fire-extinguishers and their applications.

			BSCHCEMSE302	Pharmaceutical Chemistry	1. Drugs & Pharmaceuticals 2. Fermentation	Establishment of the concept of different drug designing and discoveries, concept of aerobic and anaerobic fermentation chemistry
Chemistry	B.Sc (Prog.)	III	BSCPCEMC301	Physical Chemistry & Inorganic Chemistry	1. Phase Equilibria and Colligative Properties 2. Electrochemistry 3. Chemical Kinetics 4. Chemical and Ionic Equilibrium	Provides basic concept of phase rule in a binary liquid mixture, conductance and ionic equilibria, idea about acid-base chemistry and law kinetics of chemicals reaction
				Inorganic Qualitative Practical (Lab)	Detection of acid and basic radicals by analysis of a mixture.	
			BSCPCEMSE301	Industrial Chemistry	1. Paints 2. Electrochemical and Electro-thermal Industries 3. Ceramics 4. Rusting of Iron and Steel 5. Industrial Safety and Fire Protection	Preparation and uses of various compounds including $KMnO_4$, CaC_2, alloy steels etc. Basic concepts of Paints varnishes, dyes, ceramics fire-extinguishers and their applications.
Chemistry	B.Sc (GE)	III	BSCHCEMGE301	Physical Chemistry & Inorganic Chemistry	1. Phase Equilibria and Colligative Properties 2. Electrochemistry 3. Chemical Kinetics 4. Chemical and Ionic Equilibrium	Provides basic concept of phase rule in a binary liquid mixture, conductance and ionic equilibria, idea about acid-base chemistry and law kinetics of chemicals reaction.
				Inorganic Qualitative Practical	Detection of acid and basic radicals by	

				(Lab)	analysis of a mixture.	
Chemistry	B.Sc (Hons)	IV	BSCHCEMC401	Inorganic Chemistry – III	1. Coordination Chemistry-II 2. Chemistry of d and f Block Elements 3. Inorganic Substitution Reaction Mechanism	Explanation about the origin of colour of complexes, concepts of d- and f-block elements. Introductory idea about inorganic reaction mechanism, and hands experience on the preparations of some inorganic complexes.
				Inorganic Chemistry – III Lab	1. Preparation of Chrome alum, Mohr's salt, Cuprommonium sulphate, Sodium nitroprusside, hexamine cobalt(III) chloride, tris(ethane 1,2-ammine) nickel(III) chloride 2. Preparation of acetylacetanato complexes of Cu^{2+}/Fe^{3+} (calculation of λ_{max} of the prepared complex using instrument).	
			BSCHCEMC402	Organic Chemistry – IV	1. Alkaloids & Terpenoids 2. Organic Spectroscopy 3. Pericyclic reactions 4. Carbohydrates	Basic concept about different bioactive organic compounds like carbohydrates, alkaloids, and terpenes. Understanding principle of UV-Vis spectroscopy, IR Spectroscopy, NMR spectroscopy, mass spectrometry and their

						applications. Overall concept pericyclic reactions.
				Organic Chemistry – IV (Lab)	Quantitative analysis of some selected organic compounds	Estimation of: 1. Glucose by Fehling's solution, 2. Acetone, 3. Aniline
			BSCHCEMC403	Physical Chemistry – III	1. : Thermodynamics II & Application 2. Electrochemical Cells 3. Chemical kinetics –II 4. Phase Equilibria & Colligative Properties	Understand the concept of entropy; reversible, irreversible processes, electrodes, EMF measurement, chemical cells and their function. Understand the phase equilibrium, criteria of collision theory and transition state theory. Qualitative idea about potentiometric titrations and their applications.
				Physical Chemistry-III Lab	1. Equilibrium constant of the reaction $KI + I_2 = KI_3$ by partition method. 2. Conductometric titrations of an acid or a base (acid may be monobasic/dibasic, and similarly for the base) 3. Potentiometric titrations of an acid or a base (acid may be monobasic/dibasic, and similarly for the base)	
			BSCHCEMSE401	Mathematics and Statistics for	1. Introduction	To understand different mathematical

				Chemists	2. Differential equations & Probability 3. Vectors, matrices and determinants	functions, probability correlations, sampling, and data analysis.
			BSCHCEMSE402	Fuel Chemistry	1. Energy Sources 2. Petroleum and Petrochemical Industry 3. Lubricants	Concepts of different renewable and non-renewable energy sources and their applications.
Chemistry	B.Sc (Prog.)	IV	: BSCPCEMC401	Inorganic Chemistry & Organic Chemistry	1. Chemical Forces and Molecular Structure 2. Acids, Bases and Buffers 3. Oxidation and Reduction 4. Organic Synthesis	Gives comprehensive ideas about hybridization and shapes of atomic, molecular orbitals, bond parameters, bond- distances. Concepts of acidic and basic nature of different redox active entities along with the preparative methods of few organic compounds.
				Inorganic Quantitative (Lab)	1.Titration of Na_2CO_3 + $NaHCO_3$ mixture vs HCl using phenolphthalein and methyl orange indicators 2.To find the total hardness of water by EDTA titration 3.Titration of ferrous iron by $KMnO_4/K_2Cr_2O_7$ 4.Titration of ferric iron by $KMnO_4/K_2Cr_2O_7$ using $SnCl_2$ reduction	

			BSCPCEMSE401	Chemistry of Cosmetics & Perfumes	1. Preparation and Use of Cosmetics & Perfumes	To understand the basic concepts of cosmetics and perfumes and their preparative methods.
Chemistry	B.Sc (GE)	IV	BSCHCEMGE401	Inorganic Chemistry & Organic Chemistry	1. Chemical Forces and Molecular Structure 2. Acids, Bases and Buffers 3. Oxidation and Reduction 4. Organic Synthesis	Ideas about bonding interaction and energy of different hybridized molecular orbitals. Understanding the acidic and basic nature of different entities. Understanding the redox reactions and preparation methods of few organic compounds.
	B.Sc (GE)			Inorganic Quantitative (Lab)	1. Titration of Na_2CO_3 + $NaHCO_3$ mixture vs HCl using phenolphthalein and methyl orange indicators 2. To find the total hardness of water by EDTA titration 3. Titration of ferrous iron by $KMnO_4/K_2Cr_2O_7$ 4.Titration of ferric iron by $KMnO_4/K_2Cr_2O_7$ using $SnCl_2$ reduction	
Chemistry	B.Sc (Hons)	V	BSCHCEMC501	Organic Chemistry – V	1. Biomolecules 2. Bioenergetics 3. Pharmaceutical Compounds 4. Synthetic Methodology	Understandings different types of pharmaceuticals and bioactive compounds and their synthesis. Gives comprehensive

						ideas about the structure of DNA and of metabolism in human body system.
				Organic Chemistry – V Lab	Preparation of some selected organic compounds	
			BSCHCEMC502	Inorganic Chemistry – IV	1. Redox Potential and Redox Equilibria 2. Nuclear Chemistry 3. Organometallic Compounds	Gives the concepts of redox potentials and redox titrations. Understandings of radioactivity and organometallic compounds with their preparations.
				Inorganic Chemistry – IV Lab	Volumetric analysis: Redox titrations-permanganometry, dichromatometry, iodometry and iodimetry Volumetric analysis of mixtures involving not more than two different estimations: Fe + Cu, Fe + Cr, Fe + Ca, Ca + Ba, Ca + Mg etc.	
			BSCHCEMDSE501	Green Chemistry	1. Introduction to Green Chemistry 2. Principles of Green Chemistry 3. Examples of Green Synthesis/ Reactions and some real world cases	The students understand the chemistry of sustainable developments and environmentally friendly procedure for organic synthesis.

			BSCHCEMDSE502	Environmental Chemistry	1. The Atmosphere 2. Aspects of Environmental Inorganic Chemistry 3. The Hydrosphere 4. The Lithosphere and Pollution control	Understanding the concepts of earth's atmosphere and different toxic elements with their impact on our environment.
			BSCHCEMDSE503	Solid State Chemistry	1. Basic Concepts and selected structure 2. Crystallographic Basics 3. Chemical Bonding in Solids 4. Properties of Solids	Idea about the structure of solids crystal and laws of crystallography with their different important properties such as superconductor, semiconductors, transistors etc.
Chemistry	B.Sc (Prog.)	V	BSCPCEMDSE501	Applied Chemistry	1. Analytical Chemistry 2. Basic Principles of Green Chemistry 3. Colloidal State 4. Macromolecular Chemistry	Understanding the basic concepts of analytical chemistry, environmental chemistry and green chemistry with their application in our life.
			BSCPCEMDSE502	Spectroscopy & Quantum Chemistry, Photochemistry	1. Quantum Chmistry 2. Photochemistry 3. Spectroscopy	Learn about classical mechanics and quantum mechanics for atomic/molecular systems. Knowledge about different spectroscopic technique.
			BSCPCEMSE501	Pharmaceutical Chemistry	1. Drugs & Pharmaceuticals 2. Fermentation	Knowledge about the synthesis of different pharmaceutically active agents and their applications.

Chemistry	B.Sc (Hons.)	VI	BSCHCEMC601	Inorganic Chemistry – V	1. Bioinorganic Chemistry 2. Introduction to Analytical Chemistry 3. Chromatography 4. Catalytic Inorganic Reaction 5. Polymer	Students acquire knowledge of role of metal ions in our biological systems and application of polymers. Basic knowledge of analytical chemistry and different chromatography techniques.
				Inorganic Chemistry –V Lab	1. Complexometric Titration 2. Gravimetric Analysis 3. Ion-exchanger: Cation content of a sample by cation exchanger 4. Solvent extraction	
			BSCHCEMC602	Physical Chemistry – IV	1. Chemical Equilibrium 2. Statistical Thermodynamics & Third Law 3. Symmetry & Group Theory 4. Quantum Chemistry 5. Photochemistry & Spectroscopy	Understand the equilibrium on the basis of thermodynamic parameters. Calculation of entropy using 3rd law of thermodynamics and basic concept of group theory.
				Physical Chemistry-IV Lab	1. Kinetics of saponification of ester by conductometric method 2. Conductometric verification of Ostwald dilution law 3. Colorimetric determination of pK_{in} of methyl red	
			BSCHCEMDSE601	Chemistry of Nanomaterials	1. Basic Concepts on Nanomaterials	Learn about nanomaterials and their

					2. Synthesis and Fabrication of Nanomaterials 3. Special Nanomaterials 4. Characterization, Properties and Applications of Nanomaterials	synthesis, and charecterisations, applications.
			BSCHCEMDSE602	Dynamic Stereochemistry	1. General Introduction 2. Synthetic Approach 3. Stereochemical Aspects of a few Organic Reactions 4. Alicyclic system	Knowledge of different stereochemical reactions and conformation of different organic compounds.
			BSCHCEMDSE603	Quantum Chemistry & Spectroscopy	1. Quantum Mechanics 2. Atomic structure 3. Molecular Spectroscopy 4.	Learn about limitations of classical mechanics, quantum mechanical operators, quantization, probability distribution, and uncertainty principle. Some basic concepts of different types of molecular spectra such as vibrational, rotational, Raman, NMR, mossbauer.
Chemistry	B.Sc (Prog.)	VI		Chemistry of Biomolecules & Chemotherapy	1. Carbohydrate Chemistry 2. Amino acids and Protein 3. Heterocyclic Compound and Nucleic acids 4. Enzymes and Biochemical Process 5. Chemotherapy	Understandings of different types of biomolecules, and their activity in biological systems. Basic concepts of chemotherapy and synthesis of different drug molecules.

			BSCPCEMDSE602	Advanced Inorganic Chemistry	1. Coordination Chemistry 2. Chemistry of Main Group Elements 3. Transition Metals	Knowledge about coordination compounds and d-block/transition elements.
			BSCPCEMSE601	Fuel Chemistry	1. Energy Sources 2. Petroleum and Petrochemical Industry 3. Lubricants	Concepts of different renewable and non-renewable energy sources and their applications. Concepts of lubricants and their various properties.

Departmental Program Outcomes

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course Outcome
Geography	B.Sc. Honours	Geography not only focuses on the physical aspects of the earth systems and processes but also seeks to understand the human societies, social systems and processes. Geography in true sense has emerged as a trans- disciplinary subject integrating the study of nature and society, the regional diversity with the concepts of the space and time. It incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, Securities of food, water, energy, human health and livelihood, biodiversity, and disaster management. The programme learning outcomes relating to B.Sc. (Hons.) Programme in geography: • Demonstrating the understanding of basic concepts in geography. • Demonstrating the coherent and systematic knowledge in the discipline of geography to deal with current issues and their solution.	This CBCS based LOCF syllabus format will help students to move forward in several dimensions. Lots of opportunities will be there in near future. Students can approach towards higher education. First of all they can move towards M.A./M.Sc. Further they can approach to Ph.D. Besides, students now a days can join some modern professional courses after moving through this syllabus. They can join M.Sc. in Geoinformatics, Geographical Information Science. Furthermore they can also approach in Regional Planning, Urban Planning, Rural Development, Rural Management etc.	**Semester- I** **Course Name: Geomorphology** After the completion of course, the students will have ability to: 1. Understand the functioning of landform systems in real time and analyse how the natural and anthropogenic operating factors affects the development of landforms 2. Distinguish between the mechanisms that control these processes 3. Assess the role of structure, stage and time in shaping the landforms, interpret geological maps and apply the knowledge in geographical research. **Course Name: Cartographic Techniques** After the completion of course, the students will have ability to: 1. Understand the importance of scale in geography. 2. Read and prepare maps, comprehend locational and spatial aspects of the earth surface. 3. Use and importance of maps for regional development and decision making.

		• Display an ability to read and understand maps and topographic sheets to look at the various aspects on the space. • Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well. • Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration.		**Semester-II** **Course Name: Geography of Human and Cultural landscape** After the completion of course, the students will have ability to: 1. To Know the diversity of changing human and cultural landscape. 2. Understand of population growth and its implications. 3. Understand the diversity of culture. **Course Name: Statistical Method in Geography** After the completion of course, the students will have ability to: 1. Understand the basics of data collection and sampling. 2. Comprehend the representation and interpretation of the results. 3. Practice results in research. **Semester- III** **Course Name: Climatology and Oceanography** After the completion of course, the students will have ability to: 1. Understand the elements of weather and climate and its impacts at different scales.

				2. Comprehend the climatic aspects and its bearing on planet earth. 3. Understand the oceanic process and availability of resources. **Course Name: Geography of India** After the completion of course, the students will have ability to: 1. Understand the physical profile of the country 2. Study the resource endowment and its spatial distribution and utilization for sustainable development 3. Synthesise and develop the idea of regional dimensions at present. **Course Name: Fundamentals of Remote Sensing** After the completion of course, the students will have ability to: 1. Appreciate the strength and application of remote sensing 2. Map the resources, their location and availability using GIS software. 3. Apply this knowledge for sustainable development at local to global level. **Course Name: Spatial Statistical Techniques** After the completion of course, the students will have ability to: 1. Understand the basics of data collection and, processing for the meaningful outcomes

				2. Understand the selection of proper sampling techniques for the collection of data 3. Put into practice the results obtained for spatial analysis of results and to apply various statistical software for the study **Course Name: Geographical Techniques** After the completion of course, the students will have ability to: 1. Gain knowledge about drawing of longitudinal sections and interpretation of structure of the geological maps. 2. Predict Soil fertility (NPK, pH). 3. Acquire practical knowledge about the application of various metrological instruments. 4. Interpret and predict the climatic condition of an area. **Semester-IV** **Course Name: Introduction to Global Economic System** After the completion of course, the students will have ability to: 1. Know different types of economic activities and their utilities. 2. Understand the theories that are relevant to contemporary world. 3. Examine the importance of economic initiatives that are crucial to development.

				Course Name: Environment and Natural Resource Management After the completion of course, the students will have ability to: 1. Understand the relationship between man and environment. 2. Have good understanding on distribution, utilization and proper management of natural resources. 3. Know about the necessities that are pre-requisite for assessment and review of planning and policies. **Course Name: Digital Remote Sensing** After the completion of course, the students will have ability to: 1. Develop the skill so as to use digital satellite data using software 2. Prepare the maps based with satellite data to compare with the ground realities. 3. Classify digital data for the land use/land cover and urban studies **Course Name: Introduction to GI Science** After the completion of course, the students will have ability to: 1. Have comprehensive understanding of GIS.

				2. Have knowledge of using GPS & DGPS for the accurate location 3. Apply the GI Science platform for map making. **Course Name: Thematic Atlas** After the completion of course, the students will have ability to: 1. Have sound knowledge regarding the classification and elements of maps. 2. Have proper utilization of maps for explaining geographical issues. 3. Know the methods of preparation of various thematic maps. **Semester- V** **Course Name: Regional Planning and Sustainable Development** After the completion of course, the students will have ability to: 1. Identify notable backward regions and solutions for their overall development 2. Have comprehensive understanding regarding the different regions and application of different models and theories for integrated regional development. 3. Select appropriate indicators for the measurement of socio-economic regional development.

				Course Name: Field Techniques, Surveying and Research Methods After the completion of course, the students will have ability to: 1. Conduct proper field work for the collection of primary data to bring out grassroots realities. 2. Make use of proper tools and surveying methods for measurement in context of collection and processing of data. 3. Prepare a report based on field data. **Course Name: Geography of West Bengal** After the completion of course, the students will have ability to: 1. Understand physical geography of West Bengal and availability of resources 2. Understand the demography, economy and regional issues of West Bengal 3. Assess the developmental problems of West Bengal in the context of future planning **Course Name: Agriculture and Food Security** After the completion of course, the students will have ability to: 1. Conceptualise the agriculture and its determinants. 2. Get the overview of Indian and World agriculture regions and systems.

				3. Have sound knowledge of agriculture revolutions and food security **Course Name: Population Geography** After the completion of course, the students will have ability to: 1. Learn the role of demography and population studies as a distinct field of human geography 2. Have sound knowledge of key concept, different components of population along with its drivers 3. Examine population dynamics and characteristic with contemporary issues **Course Name: Hydrology** After the completion of course, the students will have ability to: 1. Understand the basic components of hydrological cycle and comprehend practices of integrated watershed management. 2. Evaluate the water balancing and river basin and water disputes. 3. Study the soil as a basic resource, focusing its distribution, problems and management. **Course Name: Geography of Health** After the completion of course, the students will have ability to: 1. Understand the key concepts related to health.

				2. Identify the linkages between the health and environment. 3. Explain the relationships between health and environment with reference to climate change **Semester-VI** **Course Name: Evolution of Geographical Thought** After the completion of course, the students will have ability to: 1. Understand paradigms in geography discipline through time 2. Understand the development of geographical thinking. 3. Understand the past and future trends of geography as a discipline. **Course Name: Disaster Management Project Work** After the completion of course, the students will have ability to: 1. Understand processes and impact of disaster on empirical basis. 2. Distinguish both the natural and man-made disaster. 3. Design and prepare project work on disasters. **Course Name: Political Geography** After the completion of course, the students will have ability to:

				1. Learn the concept of nation and state and geopolitical theories 2. Understand the different dimensions of resource conflicts on geopolitical base. 3. Acquire sound knowledge on politics of contemporary displacement. **Course Name: Biogeography** After the completion of course, the students will have ability to: 1. Familiarise the dynamics of climate and related theories. 2. Understand of Vegetation as an index of climate. 3. Assess of different aspects of floral and faunal provinces. **Course Name: Geography of Social Wellbeing** After the completion of course, the students will have ability to: 1. Understand the nature, scope and relationships of geography and human wellbeing. 2. Understand the spatial dimensions of social diversity components. 3. Critically analyse the social welfare programs related to inclusive and exclusive policies in India. **Course Name: Urbanization and Urban System** After the completion of course, the students will have ability to:

				1. Understand the fundamentals and patterns of urbanization process 2. Learn the functional classification of cities and Central Place Theory 3. Know contemporary problems of Delhi, Mumbai, Kolkata and Chennai **Course Name: Soil Geography** After the completion of course, the students will have ability to: 1. Understand the concepts related to soil. 2. To know the soil diversities and importance of their preservation 3. To know about soil fertility and its significance

Dept. of Mathematics
Course learning outcomes 2020-2021

Course Name: Calculus, Geometry & Differential Equations
Course Code: BSCHMTMC101

Course Learning Outcomes:
(After the completion of course, the students will have ability to):
• Understand various kinds of standard functions and graphs, techniques of integrations and
• limits.
• • Learn about real numbers and its basic properties.
• Understandthe concepts on three-dimensional geometry.
• • Understand the genesis of ordinary differential equations.
• Understand the various techniques of getting exact solutions of solvable first order
• differential equations and linear differential equations of higher order.

Course Name: Algebra
Course Code: BSCHMTMC102

Course Learning Outcomes: This course will enable the students to
• Understand the importance of roots of real and complex polynomials and learn various
• methods of obtaining roots.
• • Employ DeMoivre's theorem in a number of applications to solve numerical problems.
• Recognize consistent and inconsistent systems of linear equations by the row echelon
• form of the augmented matrix, using rank.
• • Find eigenvalues and corresponding eigenvectors for a square matrix.

Course Name: Real Analysis
Course Code: BSCHMTMC201

Course Learning Outcomes: This course will enable the students to
• Understand many properties of the real line R and learn to define sequence in terms of functions from R to a subset of R.
• Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
• Apply the ratio, root, alternating series and limit comparison tests for convergence
• and absolute convergence of an infinite series of real numbers.
• Understand the theory and concepts of Riemann integration.
• Understand the applications of the fundamental theorems of integration.

Course Name: Differential Equations and Vector Calculus
Course Code: BSCHMTMC202

Course Learning Outcomes: This course will enable the students to
• Learn the Picard's method of obtaining successive approximations of solutions of first order
• ordinary differential equations.
• • Know how to solve linear homogeneous and non-homogeneous equations of higher order with constant coefficients.
• Understand the system of linear differential equations and the solution techniques.
• • Learn conceptual differences between usual solution and power series solution of some

second order ODEs .
• Understand the theory and applications of vector analysis.

Course Name: Multivariable Calculus
Course Code: BSCHMTMC301

Course Learning Outcomes: This course will enable the students to
• Learn conceptual differences while advancing from one variable to several variables in
• calculus.
• • Apply multivariable calculus in various optimization problems.
• Understand inter-relationship amongst the line integral, double and triple integral
• formulations.
• • Visualise the structure of curves and surfaces in plane and space etc.
• Learn the applications of multivariable calculus in different fields like Physics, Economics,
• Medical Sciences, Animation& Computer Graphics etc.
• • Realize importance of Green, Gauss and Stokes' theorems in other branches of Mathematics.

Course Name: Group Theory
Course Code: BSCHMTMC302

Course Learning Outcomes: The course will enable the students to:
• Realize the basic concept of mathematical composition.
• • Link the fundamental concepts of groups and symmetries of geometrical objects.
• Explain the significance of the notions of cosets, normal subgroups, and factor groups.
• • Analyze consequences of Lagrange's theorem.
• Learn about structure preserving maps between groups and their consequences.

Course Name: Probability and Statistics
Course Code: BSCHMTMC303

• Establish a formulation helping to predict one variable in terms of the other, i.e., correlation
• and linear regression.
• • Understand central limit theorem, which establish the remarkable fact that the empirical frequencies of so many natural populations, exhibit a bell shaped curve.

Course Name: Mathematical Logic
Course Code: BSCHMTMSE301

Course Learning Outcomes: This course will enable the students to
• Understand the syntax of first-order logic and semantics of first-order languages
• • Understand about truth table, different propositions, predicates and quantifiers, basic Theorems like the Compactness Theorem, Meta Theorem and Post Tautology Theorem.
• Grasp the concept of completeness interpretations and their applications with special stress on
• applications in Algebra.

Course Name: Programming Language in C
Course Code: BSCHMTMSE302

Course Learning Outcomes: This course will enable the students to
• Acquire knowledge about one of the advanced computer language C and its applications.

• • Understand basic structure, characters, keywords, identifiers, data types, operators, expressions, etc. in C language.
• Write flow chart and corresponding C-program for solving problems requiring decision
• making, branching, looping and other control statements.
• • Learn to implement arrays and functions in C programming.
• Familiarize with the concepts of structure, union and pointers.

Course Name: Mechanics
Course Code: BSCHMTMC401

Course Learning Outcomes: This course will enable the students to:
• Familiarize with subject matter, which has been the single centre, to which were drawn
• mathematicians, physicists, astronomers, and engineers together.
• • Understand necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body.
• Determine the centre of gravity of some materialistic systems and discuss the equilibrium of
• a uniform cable hanging freely under its own weight.
• • Deal with the kinematics and kinetics of the rectilinear and planar motions of a particle including the constrained oscillatory motions of particles.
• Learn that a particle moving under a central force describes a plane curve and know the
• Kepler's laws of the planetary motions, which were deduced by him long before the
• mathematical theory given by Newton.

Course Name: Linear Algebra
Course Code: BSCHMTMC402

Course Learning Outcomes: This course will enable the students to:
• Understand the concepts of vector spaces, subspaces, bases, dimension and their properties.
• • Relate matrices and linear transformations, compute eigen values and eigen vectors of linear transformations.
• Learn properties of inner product spaces and determine orthogonality in inner product
• spaces.
• • Realise the importance of adjoint of a linear transformation and its canonical form.

Course Name: Partial Differential Equations and Calculus of Variations
Course Code: BSCHMTMC403

Course Learning Outcomes: This course will enable the students to
• Understand the geometric and physical nature of Partial Differential Equations and classify them
• accordingly.
• • Apply a range of techniques to solve first and second order partial differential equations.
• Model physical phenomena using partial differential equations such as the heat and wave
• equations.
• • Understand problems, methods and techniques of calculus of variations.

Course Name: Graph Theory
Course Code: BSCHMTMSE401

Course Learning Outcomes: This course will enable the students to
• Appreciate the definition and basics of graphs along with types and their examples.

• • Understand the Eulerian circuits, Eulerian graphs, Hamiltonian cycles, representation of a graph by matrix.
• Relate the graph theory to the real-world problems.

Course Name: Object Oriented Programming in C++
Course Code: BSCHMTMSE402

Course Learning Outcomes:
(After the completion of course, the students will have ability to):
• Understand the basic characteristics of object oriented programming languages, different
• components and structures in C++ programming language.
• • Understand and apply the programming concepts of C++ which is important for mathematical investigation and problem solving.
• Use mathematical libraries for computational objectives.
• • Represent the outputs of programs visually in terms of well formatted text and plots.

Course Name: Set Theory and Metric Spaces
Course Code: BSCHMTMC501

Course Learning Outcomes: This course will enable the students to:
• Learn basics about the cardinality of a set.
• • Learn abstract formulation of the notion “distance” on an arbitrary set and learn how known concepts like continuity, convergence of sequences etc behave in such abstract setting.
• Understand several standard concepts of metric spaces and their properties like
• openness, closeness, completeness, compactness, Bolzano-Weierstrass property,
• and connectedness.
• • Identify the continuity of a function defined on metric spaces and homeomorphisms.

Course Name: Advanced Algebra
Course Code: BSCHMTMC502

Course Learning Outcomes: This course will enable the students to
• Understand the automorphism, inner automorphism and the fundamental concepts of group
• actions and their applications
• • Understand the application ofSylow theorems to characterize certain Finite Groups.
• Be acquainted with the basic concepts of Ring Theory such as the concepts of ideals, quotient
• rings, Integral domains and Fields.
• • Know in detail about polynomial rings, fundamental properties of finite field extensions and classification of Finite Fields.

Course Name: Linear Programming and Game Theory
Course Code: BSCHMTMDSE503

Course Learning Outcomes: This course will enable the students to
• Analyze and solve linear programming models of real life situations.
• • Provide graphical solution of linear programming problems with two variables, and illustrate the concept of convex set and extreme points.
• Solve linear programming problems using simplex method.
• • Learn techniques to solve transportation and assignment problems.

• Solve two-person zero sum game problems.

Course Name: Complex Analysis
Course Code: BSCHMTMC601

Course Learning Outcomes: This course will enable the students to:
• Visualize complex numbers as points of $\mathbb{R}2$
• and stereographic projection of complex
• plane on the Riemann sphere.
• • Understand the significance of differentiability and analyticity of complex functions leading to the Cauchy-Riemann equations.
• Learn the role of Cauchy-Goursat theorem and Cauchy integral formula in evaluation
• of contour integrals.
• • Apply Liouville's theorem in fundamental theorem of algebra.
• Understand the convergence, term by term integration and differentiation of a power
• series.
• • Learn Taylor and Laurent series expansions of analytic functions, classify the nature of singularity, poles and residues and application of Cauchy Residue theorem.

Course Name: Numerical Methods & Numerical Lab
Course Code: BSCHMTMC602

Course Learning Outcomes: This course will enable the students to
• Understand the problem solving skills using numerical methods,
• • Handle large system of equations, non-linearity and that are often impossible to solve analytically,
• Solve differential equations by numerical methods,
• • Develop problem solving skills using computer programming,
• Acquire knowledge of C programming language,
• • Solve different numerical problems using algorithm, flowchart, C language programming.

Course Name: Discrete Mathematics
Course Code: BSCHMTMDSE601

Course Learning Outcomes: This course will enable the students to
• Learn about partially ordered sets, lattices and their types.
• • Understand Boolean algebra and Boolean functions, logic gates, switching circuits andtheir applications.
• Solve real-life problems using finite-state and Turing machines.
• • Assimilate various graph theoretic concepts and familiarize with their applications.

Course Name: Number Theory
Course Code: BSCHMTMDSE602

Course Learning Outcomes: This course will enable the students to:
• Learn about some important results in the theory of numbers including the prime number
• theorem, Chinese remainder theorem, Euler's theorem, Wilson's theorem and their
• consequences.
• • Learn about number theoretic functions, modular arithmetic and their applications.
• Familiarise with modular arithmetic and find primitive roots of prime and composite numbers.
• • Know about open problems in number theory, namely, the Goldbach conjecture and

Twin-prime conjecture.
• Apply public crypto systems, in particular, RSA.

Course Name: Advanced Mechanics
Course Code: BSCHMTMDSE603

Course Learning Outcomes: This course will enable the students to
• Understand the reduction of force system in three dimensions to a resultant force acting at a base
• point and a resultant couple.
• • Learn about a null point, a null line, and a null plane with respect to a system of forces acting on
a rigid body together with the idea of central axis.
• Know the inertia constants for a rigid body and the equation of momental ellipsoid together with
• the idea of principal axes and principal moments of inertia to derive Euler's dynamical equations.
• • Study the kinematics and kinetics of fluid motions to understand the equation of continuity in cartesian, cylindrical polar and spherical polar coordinates which are used to derive Euler's equations and Bernoulli's equation.
• Deal with two-dimensional fluid motion using the complex potential.
• • Understand the concepts of sources, sinks, doublets and the image systems of these with regard
to a line and a circle.

Course Name: Bio Mathematics
Course Code: BSCHMTMDSE604

Course Learning Outcomes: This course will enable the students to
• Grasp the idea of various bio-mathematical models and techniques which will help them to tackle
• physical world problems.

Department of Physics
Physics (Hons.)

Program Outcome (PO):

In BSc Physics program the students learn the cause of different natural phenomena through understanding the core of physics, including substantial experimental physics, enabling them to train in both the theoretical and practical aspects. They are provided with a high quality education in physics within an environment committed to excellence in both teaching and research. The programme is oriented in such a way that it helps students to prepare themselves tackling problems of day to day life by correlating them with appropriate physical principles. The students will also be able to demonstrate their skills in scientific enquiry, problem solving and techniques adopted in the laboratory using experimental, computational, and/or theoretical method based on basic laws of physics.

Program Specific Outcome (PSO)

1. To understand the basic laws and explore the fundamental concepts of physics.
2. To understand the concepts and significance of the various physical phenomena.
3. To carry out experiments to understand the laws and concepts of Physics.
4. To apply the theories learnt and the skills acquired to solve real time problems.
5. To acquire a wide range of problem solving skills, both analytical and technical and to apply them.
6. To enhance the student's academic abilities, personal qualities and transferable skills this will give them an opportunity to develop as responsible citizens.
7. To produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community.
8. To motivate the students to pursue PG courses in reputed institutions.
9. This course introduces students to the methods of experimental physics. Emphasis will be given on laboratory techniques specially the importance of accuracy of measurements.
10. Providing a hands-on learning experience such as in measuring the basic concepts in properties of matter, heat, optics, electricity and electronics.

Course Outcome (CO):

Name of the Course	Course Type	Course Code	Course Outcome (CO)
Mathematical Methods of Physics –I	Core	BSCHPHSC101	After the completion of course, the students will have ability to: 1. Enrich themselves with analytical tools needed for further studies in physics, like basic linear algebra, vector algebra and calculus, solutions of ordinary and partial differential equations, probability distributions,

			determinant and non-singular matrices. 2. Apply the techniques for solving different problems related to probability, differential equations, integral transform and linear algebra.
Mechanics	Core	BSCHPHSC102	After the completion of course, the students will have ability to: 1. Understand classical mechanics of single as well as system of particles within the scope Newtonian formulation. 2. Explain general properties of bulk matter and different types of simple harmonic linear oscillations.
Mathematical Methods of Physics-II	Core	BSCHPHSC201	After the completion of course, the students will have ability to: 1. Work with (i) different properties of special functions, useful in other branches of physics; (ii) Fourier expansion of analytic functions; (iii) properties of complex variables and their integrals; (iv) standard integrals. 2. Do computer programming using C /C++, aiming for basic mathematical problems as well as on problems based on standard numerical analysis.
Electricity and Magnetism	Core	BSCHPHSC202	After the completion of course, the students will have ability to: 1. Discuss the properties of (i) the produced electric field due to charges at rest; (ii) the produced magnetic field due to steady, both in free-space and inside matter. 2. Explain the idea of electromagnetism, through Maxwell's equation. 3. Analysis of electrical networks and bridges in presence of alternating currents.
Classical Mechanics and Special Theory of Relativity	Core	BSCHPHSC301	After the completion of course, the students will have ability to: 1. Explain the classical

			mechanics of rotating systems and particle under central force. 2. Understand the Lagrangian and Hamiltonian formulations of classical mechanics. 3. Explain the necessity of replacing Newtonian relativity through Einstein's special relativity, and elaborate on the classical mechanics of fast particles under the special relativity.
Thermal Physics – I	Core	BSCHPHSC302	After the completion of course, the students will have ability to: 1. Demonstrate molecular motion (kinetics) inside an ideal and a real classical gas. 2. Explain how the processes of heat transfer through solid, viz., conduction and radiation
Analog Systems and Applications	Core	BSCHPHSC303	After the completion of course, the students will have ability to: 1. Explain the electronic transport mechanisms through intrinsic and extrinsic semiconductors. 2. Understand the theory of the transport through doped semiconductor junctions in diodes, transistors. 3. Use diode as rectifier and junction transistors as amplifiers.
Electrical Circuit Network Skills	Skill Enhancement Course (SEC) Practical	BSCHPHSSEC 301	After the completion of course, the students will have ability to: 1. Design and trouble shoots the electrical circuits, networks and appliances through hands-on mode. 2. Choose proper devices depending upon application considering economic and technology up-gradation.
Electromagnetic Theory	Core	BSCHPHSC401	After the completion of course, the students will have ability to: 1. Demonstrates the theory behind the generation of the electromagnetic (transverse) progressive wave in combination of oscillating

			electric and magnetic fields. 2. Understand the basics of electromagnetic wave and its propagation through conducting and non-conducting medium and their application in modern day communication system. 3. Understand he theories of the manifestations by EM wave (viz., dispersion, scattering, polarisation).
Waves and Optics	Core	BSCHPHSC402	After the completion of course, the students will have ability to: 1. Explain linear superposition of several collinear and mutually perpendicular SHMs. 2. Grow understanding due to manifestations by the optical (light) waves (viz., interference, diffraction and polarisation) can be made. 3. Apply knowledge of sound waves, and light waves to explain natural physical processes and related technological advances.
Digital Systems and Applications	Core	BSCHPHSC 403	After the completion of course, the students will have ability to: 1. Work with binary logic, and thus know how different kinds of logic gates work. 2. Develop a digital logic and apply it to solve real life problems. 3. Understand the difference between combinational and sequential logic circuits. 4. Analyze, design and implement combinational and sequential logic circuits. 5. Gain knowledge how modern day computer works.
Basic Instrumentation Skills	Skill Enhancement Course (SEC) Practical	BSCHPHSSEC401	After the completion of course, the students will have ability to: 1. Get exposure with various aspects of instruments and their usage through hands-on mode. 2. Do experiments listed below in continuation of the topics
Quantum Mechanics	Core	BSCHPHSC501	After the completion of course,

			the students will have ability to: 1. Explain the failures of classical theory in explaining different experiments of early twentieth century are discussed. 2. Understand ideas of wave-particle duality, matter-wave. 3. Explain how the importance of Schrodinger equation (time-dependent and time-independent) to demonstrate solutions of some systems for different proto-type potentials (1d and 3d) . 4. Understand the concepts of quantum (Hermitian) operators and basis vectors.
Thermal Physics II	Core	BSCHPHSSC502	After the completion of course, the students will have ability to: 1. Demonstrate a mastery of the core knowledge in the areas of Thermal Physics. 2. Explain the concept of thermodynamic as an empirical description for the thermal properties of a macroscopic system. 3. Understand the applications of thermodynamics and the theory of the phase-transitions are discussed
Nuclear and Particle Physics	Discipline Specific Elective	BSCHPHSDSE501	After the completion of course, the students will have ability to: 1. Explain structure and properties of nuclei, the mechanism of different radioactive decays and their applications in peaceful use of nuclear energy. 2. Understand what are the elementary particles that constitute this known universe. 3. Gather capability of elementary problem solving in nuclear and particle physics.
Atomic Physics & Spectroscopy	Discipline Specific Elective	BSCHPHSDSE503	After the completion of course, the students will have ability to: 1. Understand the concepts of atomic spectra and its origin using the old quantum theory

			whose consistency can be later verified by the direct application of the quantum mechanics. 2. Account for theoretical models, terminology & working methods used in atomic and molecular physics. 3. Carry out experimental and theoretical studies on atomic and molecular physics with focus on structure and dynamics of atoms and molecules.
Statistical Mechanics	Core	BSCHPHSC601	After the completion of course, the students will have ability to: 1. Understand how probability theory can be used to derive relations between the microscopic and macroscopic properties of matter. 2. Understand classical and quantum statistics and their application in different systems enable students to develop knowledge about how Bosonic and Fermionic systems behave. 3. Realize how electrons behave in metals and semiconductors, and photons in blackbody radiations or phonons in solids.
Condensed Matter Physics	Core	BSCHPHSC602	After the completion of course, the students will have ability to: 1. Understand the lattice structure in crystalline solids and their different properties (viz., dielectric, magnetic, electrical transport). 2. Explain elementary idea on superconductivity.
Applied Optics	Discipline Specific Elective	BSCHPHSDSE601	After the completion of course, the students will have ability to: 1. Understand the geometrical / ray optics through transfer matrix-formalism 2. Acquire basic knowledge on different types of optical phenomena 3. Realize the technological applications of optical phenomena as a background of

			the fiber optics, holography, LASER and photo-detectors. 4. Analyze different laser systems and its applications in various fields. 5. Conceptualize optical fiber, its construction and importance in communication physics.
Nanomaterials and Applications	Discipline Specific Elective	BSCHPHSDSE604	After the completion of course, the students will have ability to: 1. Gain experience in applying unique properties of nanomaterials to solve problems and challenges in our life. 2. Demonstrate the ability to develop case studies of nanomaterials with a focus on fundamentals, fabrication, characterization, and applications. 3. Gather knowledge about synthesis, characterization and applications of nanomaterials. 4. Collect information about optical, electrical and mechanical properties of the nanomaterials.

Name of the Department	Department of Zoology
Name of the Programme	B Sc in Zoology
Programme Outcome	After successful completion of the programme, the students will have the concepts of classical Zoology and the different ecological concepts. Apart from developing an appreciation on animals and their behaviour the students become abreast with the modern concepts on genetics, molecular biology, cell biology, biochemistry, immunology, developmental biology and physiology. The students also become skilled in both the theoretical and practical aspects. Field studies and excursion imprint concepts of teamwork as well as life on the outdoors.
Programme Specific Outcome	The specific outcomes of the programme include progression of students for higher education like M Sc and Ph D. This course also trains students in the field of applied zoology like sericulture, apiculture etc. The students also have the opportunity to get engage in different biotechnology and medicine industries. Finally, the programme is versatile enough to ensure that students be successful in different competitive examinations.
Course outcome:	
Course	**Outcome**
Systematics & Diversity of Life - Protists to Chordates	This classical zoology paper develops concepts of animal classification as well as different features on the diversity of animal life.
Ecology	This course will provide knowledge on different principles of ecology and environment; the interactions between species and their environments.
Comparative Anatomy & Physiology of Nonchordates	The course makes a detailed comparison of the anatomy, physiology of the different taxa of non-chordates.
Cell Biology and Histology	Students will gain detailed insight into basic concepts of cellular structure and function.
Comparative Anatomy & Physiology of Chordates	This paper studies the anatomy and physiology across the entire vertebrate - animal kingdom.
Genetics	Students will gain the basic concepts on genes and heredity.
Biochemistry	The properties of different biomolecules and their metabolic and biochemical activities are studied in this course.
Behaviour and Chronobiology	The paper explains the natural behaviour patterns; function of biological clocks.

Developmental Biology & Evolution	This course studies the process of animal development and the process of evolution.
Molecular Biology	Molecular biological processes are studied in this course.
Biotechniques	The different modern techniques and methodologies used in zoology are studied here.
Microbiology, Parasitology & Immunology	Different aspects of microbiology, parasitology and immunology are studied here.
Biostatistics & Bioinformatics	Application of bioinformatics and statistics in biology are studied here.
Applied Zoology	This course deals with the application of Zoology for commercial purposes.
Genetic Engineering and Biotechnology	A modern field concerned with the modern uses of genetic engineering and biotechnology.
Livestock Management and Animal Husbandry	This paper deals with livestock management and animal husbandry.
Endocrinology	This paper deals with hormones of our body and related issues.
Wild Life Conservation and Management	This paper deals with the conservation and management of wild life.
Mammalian Physiology	The paper deals with various physiological functions in mammals.
Aquatic Biology	The course aims to provide students with a broad-based foundation in science together with extensive subject knowledge in the discipline of aquatic biology.
Beekeeping	The course describes the bee biology and economical aspects of bee keeping.
Sericulture	The course describes the detailed biology and economical aspects of sericulture.
Public Health and Hygiene	The course describes the health and hygiene related issues of human society.
Insect Pest, Vector Biology and Management	The course deals with the study of insect pests, vectors and their management.

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Commerce Department	B.Com Programme	Commerce as a subject involves the study of activities related to trade, business, exchange and allied areas like laws, governance and accounting in order to run business enterprises smoothly. The key areas of study within the discipline of commerce comprise: accounting, finance, human resource management, marketing, economics, use of IT etc. The depth of the courses would vary in accordance with the nature of topic in relation to	• To instill in students the basic knowledge and fundamentals of commerce and business which would be beneficial for them to comprehend, analyse and evaluate the current economic/business scenario of the country and the world at large. • To develop in students the capability to transform theoretical and conceptual knowledge into practical problem-solving approach using critical thinking. • To develop skills which would help them undertake research and innovations in commerce	After completion of this program (under LOCF), the students will be able to acquire the following attributes, qualities and skills: **Disciplinary Knowledge** The curriculum planning of B.Com.(Program) envisages the students demonstrating fundamental knowledge of the areas related to finance, accounting, human resource management, international business, corporate and business laws, taxation, marketing etc. The students will be made capable of evaluating diverse perspectives

		their respective relevance and industry demand in the current scenario. Also, in order to enhance the options of employability, experiential and practical approach will be followed in respect of topics which demand hands-on exposure. Focus would be on helping the students simulate themselves in the actual working situations like analysing annual reports and balance sheets, working on live software etc.	and would enhance their employability	provided by the prism of these areas and a comprehensive picture of business situations, using modern ways and means of dealing with issues arising in the dynamic business world. **Communication Skills** The teaching learning pedagogies used in the programme will make the students capable enough to deliver and communicate information pertaining to business effectively. **Problem Solving** The programme involves acquainting the students with problem solving techniques by providing them with

				real life situations through case-studies. The students shall be able to develop better sense of problem solving after going through the courses. **Analytical Reasoning** The courses offer opportunity for students to develop analytical reasoning through their active participation and involvement in teaching-learning process as envisioned in the student centric approach. **Cooperation/ Team Work** The curriculum also inculcates in the young minds the qualities of teamwork, cooperation and solidarity

				which can be seen as a vision of the current business world. They shall be able to gain insight into the need to balance the aspects of collaboration and competition for healthier delivery to society whose hallmark currently is fierce competition. The courses included in the programme teach the students to cultivate such characteristics keeping the larger societal welfare and sustenance in mind. **Research-related skills** The courses make them understand the need of the current business world and make them

				capable to view different aspects and dimensions from global perspective. The courses are designed in such a way that the learners are encouraged to seek deeper understanding of issues and develop research abilities. **Moral and ethical awareness/reasoning** The courses also involve training the students to check unethical behaviour, falsification and manipulation of information in order to avoid debacles which can be seen rising persistently over the period of time. **Lifelong Learning**

				The courses are formulated to develop a sense of attitude towards life-long learning as the world of business is constantly in a state of flux. The course content shall help students build on sustaining themselves and being relevant in all times through having such an attitude.

DEPARTMENT OF ECONOMICS

HONOURS

COURSE NAME	COURSE CODE	COURSE DETAILS	ABOUT THE COURSE	LEARNING OUTCOMES
Microeconomic Theory - I	*BSCHECOC101*	CC-1	This is a theoretical course.	*1. Understand the concept of economics, the distinction between micro economics and macroeconomics, concept of demand and its relevance in a market economy.* *2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives* *3. Realize the operation of the markets, the distinction between real world market and the concept of market in economics. The ideas of perfect market, the nature and causes of market imperfection will help the students to judge the mechanisms of market economy and to take judicious decision.*
Macroeconomic Theory - I	BSCHECOC102	CC-2		*1. Be acquainted with the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner.* *2. Understand the development of the macroeconomic thoughts from the last quarter of the eighteenth century to mid twentieth century, the Classical and the Keynesian theory of income and employment.* *3. Know the impacts of great depression on the world economy and the development of different macro theories as a consequence of this event.*
Microeconomic Theory - II	*BSCHECOC201*	CC-3		*1. To understand, the decision-making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets.* *2. To deal with the theoretical aspect and issues in the factor pricing theories.* *3. To understand the framework of General equilibrium and Pareto criteria of optimality.*
Mathematical Economics - I	*BSCHECOC202*	CC-4		*1. To understand basic concepts, procedures and techniques of mathematical economics.* *2. To discuss how these tools can be applied in economics.* *3. To develop analytical ability to express economic ideas using mathematics techniques.*
Statistical Methods-I	*BSCHECOC301*	CC-5		1. *To understand basic knowledge of data presentation, measures of central tendency, dispersion, skewness and kurtosis.* 2. *To grasp knowledge of correlation, simple regression analysis and Index numbers.* 3. *To develop skills in the field of economic analysis and reasoning.*
Macroeconomic Theory-II	*BSCHECOC302*	CC-6		*1. To grasp knowledge of theories of consumption, investment and the importance of these theories in analyzing aggregate behaviour.* *2. To understand theoretical aspects of demand for and supply of money.* *3. To understand the concepts of and impact of inflation in an economy.*

Development Economics	*BSCHECOC303*	CC-7		*1. To understand the concept of development, distinction between economic growth and economic development and also the concepts sustainable development, inclusive development, human development etc.* *2. To understand the reasons behind difference in growth rate between countries and pinpoint the factors responsible for poor economic status of the developing countries.* *3. To gain knowledge regarding development strategies needed for a labour surplus economy and also the choice of technique in such an economy.*
Data Analysis	*BSCHECOSE301*	SEC-1		*1. To understand methods of presentation of data in textual, tabular and diagrammatic form.* *2. To understand steps and problems associated with data processing and the analysis of various forms of data (quantitative, qualitative; cross section, time series).* *3. To do Project based on techniques taught in this paper which will be helpful to them in further research.*
Basic Computer Applications	*BSCHECOSE302*	SEC-1		*1. To acquire basic knowledge regarding use of Excel for sorting and filtering data to prepare various chart.* *2. To understand how to carry out statistical analysis using Excel.* *3. To do Project based on techniques taught in this paper which will be helpful to them in further research.*
Statistical Methods-II	*BSCHECOC401*	CC-8		*1. To work on time series data to extract meaningful statistics and other characteristics of the data.* *2. To understand the concept of random variables and also some commonly used discrete and continuous distributions of random variables. Students will learn how to estimate population parameters based on random samples and test hypotheses about these parameters.* *3. To gather knowledge of descriptive and inferential statistical concepts for the analysis of economic data.*
Indian Economics-I	*BSCHECOC402*	CC-9		*1. understand the situation of the Indian economy in the post- independence regime.* *2. be acquainted with different policies, relating to agriculture, industry etc. undertaken after independence to build up a self-reliant economy.* *3. be updated regarding growth experience of the Indian economy amidst huge population pressure and the ways to move the economy in the growth trajectory.* *4. understand the issues of poverty, unemployment and black economy.*
Mathematical Economics-II	*BSCHECOC403*	CC-10		*1. To acquire knowledge of matrices and determinants and their applications in economics.* *2. To tackle the issues of optimization where the optimizer faces inequality constraints. Students will learn the technique of optimization where the objective functions as well as constraint inequalities are all linear.* *3. To understand basics of game theory as a tool in arriving decisions in markets where the sellers have mutual interdependence.*
Project on Rural Development	*BSCHECOSE401*	SEC-2		*This course is meant to encourage students to search on different aspects of rural development. Students are encouraged to examine the issues that may hinder the process of development in rural areas.*
Computer Applications in Economics	*BSCHECOSE402*	SEC-2		*1. To understand different types of data and their presentation using spreadsheet/Excel.* *2. To understand how to carry out statistical analysis using Excel.* *3. To do Project based on techniques taught in this paper which will be helpful to them in*

				further research.
Public finance	*BSCHECOC501*	CC-11		*1. To understand the problems of resource allocation in the presence of public goods and externalities.* *2. To get an insight regarding the issues of public debt and its implication on the economic system.* *3. To understand the centre-state financial relations and their implications in a federal structure.*
International Economics	*BSCHECOC502*	CC-12		*1. To develop a strong foundation in the principles of international economics which will help them to know the trade policies at the national and international levels and the impact of the globalization on income, employment and distribution of income.* *2. To understand classical and modern theories of international trade. It familiarizes students on trade policies on the one hand and on the other hand introduces open economy macroeconomics dealing with exchange rate determination in presence of 'expectation' and different polices to maintain stability in the external front.* *3. To understand and analyse the real-world trade related issues.*
Classical Political Economy	*BSCHECODSE501*	DSE (DSE 1&2)		*1. To gain insight regarding the development of economic thoughts starting from English Classical School.* *2. To understand the stage theories of development of Rostow and Marx.* *3. To understand the workings of capitalist economy in Marxian view.*
Indian Economic History	*BSCHECODSE502*	DSE (DSE 1&2)		1. To analyze key aspects of Indian economic development during the second half of British colonial rule. 2. To investigate the situation of Indian economy with respect to agriculture, industry, infrastructural development during colonial regime.
Money and Financial Market of India	*BSCHECODSE503*	DSE (DSE 1&2)		*1. To understand the role of financial markets and financial institutions in the overall development of an economy.* *2. To understand about the structure and functions of money markets and capital markets in India.* *3. To understand the workings of the banking system of the country and the key roles played by RBI in effective supervision and control of the monetary system in India.*
Environmental Economics	*BSCHECODSE504*	DSE (DSE 1&2)		1. To understand the linkage between economy and the environment. 2. To use economic techniques to analyze environmental problems and to assess environmental policies. 3. To understand the issues of Climate change and policies of sustainable development
Basic Econometrics	*BSCHECOC601*	CC-13		*1. To understand the concept of econometrics.* *2. To handle economic data that are not generated as the result of a controlled experiment.* *3. To form and solve a model based on economic theories and using the results for forecasting or prediction.*
Indian Economics-II	*BSCHECOC602*	CC-14		*1. To understand about the history of planning process in India and the role of planning in the overall development of the economy and also the role of new institutions in furthering this progress.* *2. To be acquainted with the problems and policies with regard to public sector, tax structure in India, reforms in tax structure.* *3. To gain insights regarding India's foreign trade, the problems there off and the policies to be undertaken to mitigate trade deficit.*
Economics of Growth	*BSCHECODSE601*	DSE (DSE		*1. To gain knowledge regarding Keynesian model of economic growth such as Harrod-*

		3&4)		*Domar model and neoclassical growth model such as Solow model. Students will also learn basic endogenous growth theory (AK model). 2. To understand the relevance of Trade as an engine of growth and development and the probable benefits and disadvantages of import substitution and export promotion policies.*
Agricultural Economics	*BSCHECODSE602*	DSE (DSE 3&4)		*1. To gain idea regarding Agricultural Economics. They also may be interested in agriculture, the backbone of Indian economy 3. To develop ideas about various concepts like production, farm organization, agricultural marketing and finance, agricultural policy and so on 4. To learn about the vast unharnessed potentials in Indian agriculture*
Entrepreneurial Economics	*BSCHECODSE603*	DSE (DSE 3&4)		*1. To understand the role of the entrepreneur and their interaction with the wider economy. 2. To gain knowledge about; the concepts and basic characteristics of entrepreneurship, role of entrepreneurship in economic development, rural entrepreneurship, project identification and selection, theories of entrepreneurship, sources of finance for new ventures and expansion strategies.*
Project on Socio Economic Aspects	*BSCHECODSE604*	DSE (DSE 3&4)		*This course is meant to encourage students to conduct theoretical or empirical survey on different socio-economic aspects and to give them some exposure to research works.*

DEPARTMENT OF ECONOMICS

ECONOMICS GENERIC

COURSE NAME	COURSE CODE	COURSE DETAILS	ABOUT THE COURSE	LEARNING OUTCOMES
Microeconomic Theory - I	BSCHECOGE101	GEC-1		*1. Understand the concept of economics, the distinction between micro economics and macroeconomics, concept of demand and its relevance in a market economy. 2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives 3. Acquire the concept of different types of costs and the relevance of costs of production in making pricing decision by a producing unit.*
Indian Economics: Post Independence	BSCHECOGE102	GEC-1		*1. Informed about the situation of the Indian economy in the post- independence regime. 2. Acquainted with different policies, relating to agriculture, industry etc. undertaken after independence to build up a self-sufficient economy. 3. Updated regarding growth experience of the Indian economy amidst huge population pressure and the ways to move the economy in the growth trajectory.*
Money and Banking	BSCHECOGE 201	GEC-2		*1. To understand some basic ideas relating to monetary analysis and financial markets with reference to Indian financial markets. 2. To gain knowledge about the theories of demand for money and supply of money, measures of money supply in India. 3. To develop knowledge of working of banking- commercial banks, central bank, rural banking, non-banking financial intermediaries.*
Microeconomic Theory-II	BSCHECOGE 202	GEC-2		*1. To understand, the decision-making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets. 2. To acquire knowledge about the factor pricing theories.*
Introductory Macroeconomics	*BSCHECOGE301*	GEC-3		*1. Realize the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner.*

				2. Understand the development of the two popular macroeconomic thoughts; the Classical and the Keynesian theory of income and employment.
Contemporary Issues of Indian Economy	*BSCHECOGE302*	GEC-3		*1. To understand the situation of the Indian economy in the post- independence regime.* *2. To gain understanding regarding planning process in India and its implication for the overall development of the economy.* *3. To learn regarding problems related to foreign trade and tax structure.*
Public Economics	*BSCHECOGE401*	GEC-4		*1. To understand the problems of resource allocation in the presence of public goods and externalities.* *2. To get an insight regarding the issues of public debt and its implication on the economic system.* *3. To understand the centre-state financial relations and their implications in a federal structure.*
Development Economics	*BSCHECOGE402*	GEC-4		*1. To understand the concept of development, distinction between economic growth and economic development and also the concepts of sustainable development, inclusive development, human development etc.* *2. To understand the reasons behind difference in growth rate between countries and pinpoint the factors responsible for poor economic status of the developing countries.* *3. To grasp knowledge of various models to understand process of economic development and the issue of labour surplus economy with respect to choosing appropriate development strategy.*

DEPARTMENT OF ECONOMICS

PROGRAM

COURSE NAME	COURSE CODE	COURSE DETAILS	ABOUT THE COURSE	LEARNING OUTCOMES
Microeconomic Theory - I	BSCPECOC101	CC-1		*1. Understand the concept of economics, the distinction between micro economics and macroeconomics, concept of demand and its relevance in a market economy.* *2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives.* *3. Acquire the concept of different types of cost and the relevance of cost of production in making pricing decision by a producing unit.*
Macroeconomic Theory	BSCPECOC201	CC-3		*1. Be acquainted with the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner.* *2. Understand the development of the macroeconomic thoughts from the last quarter of the eighteenth century to mid twentieth century, the Classical and the Keynesian theory of income and employment.* *3. Know the impacts of great depression on the world economy and the development of different macro theories as a consequence of this event.*
Microeconomic Theory-II	BSCPECOC301	CC-5		*1. To understand, the decision making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets.* *2. To deal with the theoretical aspect and issues in the factor pricing theories.*
Data Collection and Data Processing	BSCPECOSE301	SEC-1		*1. To understand methods of presentation of data in textual, tabular and diagrammatic form.* *2. To understand steps and problems associated with data processing and the analysis of various forms of data (quantitative, qualitative; cross*

				section, time series). *3. To do Project based on techniques taught in this paper which will be helpful to them in further research.*
Indian Economics	BSCPECOC401	CC-7		*1. To understand the situation of the Indian economy in the post- independence regime.* *2.To be acquainted with different policies, relating to agriculture, industry etc. undertaken after independence to build up a self-reliant economy.* *3. To understand the sources of revenue and expenditure of central and state government, the centre-state financial relation etc.*
Basic Knowledge in Computer	BSCPECOSE401	SEC-2		*1. To acquire basic knowledge regarding use of Excel for sorting and filtering data to prepare various chart.* *2. To understand how to carry out statistical analysis using Excel.* *3. To do Project based on techniques taught in this paper which will be helpful to them in further research*
Development Economics	BSCPECODSE501	DSE		*1. To understand the concept of development, distinction between economic growth and economic development and also about the broad indicators of economic development.* *2. To understand the reasons behind difference in growth rate between countries and pinpoint the factors responsible for poor economic status of the developing countries.* *3. To gain knowledge regarding development strategies needed for a labour surplus economy and also the choice of technique in such an economy.* *4. To understand about development of various international institutions.*
Banking Sector	BSCPECODSE501	DSE		*1. To understand the functions of commercial banks and the central bank* *2. To understand the working of various kinds of non-banking financial intermediaries.*
Computer Application in Economics	BSCPECOSE501	SEC-3		*1. To understand different types of data and their presentation using spreadsheet/Excel.* *2. To understand how to carry out statistical analysis using Excel.* *3. To do Project based on techniques taught in this paper which will be helpful to them in further research.*
Economic History of India 1857-1947	BSCPECODSE601	DSE		1. To analyze key aspects of Indian economic development during the second half of British colonial rule. 2. To investigate the situation of Indian economy with respect to agriculture, industry, infrastructural development during colonial regime.
Public Finance	BSCPECODSE602	DSE		*1. To understand the problems of resource allocation in the presence of public goods and externalities.* *2. To get an insight regarding the issues of public debt and its implication on the economic system.* *3. To understand the centre-state financial relations and their implications in a federal structure.*
Project on Economic Issues	*BSCPECOSE601*	SEC-4		*This course is meant to encourage students to examine thoroughly on economic issues and to give them some exposure to research works.*

Kazi Nazrul University, Asansol

SYLLABUS OF B.SC. (PROGRAM) WITH ELECTRONICS

2019-2020

SEMESTER – I

Course Name: Circuit Theory and Network Analysis

Course Code: BSCPELCC101

<table>
<tr><td colspan="2">Course type: Core
(Theory + Practical)</td><td colspan="3">Course details: CC-1(1)</td><td colspan="2">L-T-P : 4-0-4</td></tr>
<tr><td rowspan="3">Credit: 6</td><td rowspan="3">Full marks: 100</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>30</td><td>10</td><td>20</td><td>40</td></tr>
</table>

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Understand DC transient analysis.
- Solve Problems of transients.
- Understand AC circuit analysis.
- Study basic circuit concepts in a systematic manner suitable for analysis and design.
- Analyze the electrical circuit using network theorems.
- Understand the two port network parameters.

Content/ Syllabus:

Core Course - I (Theory)

CIRCUIT THEORY AND NETWORK ANALYSIS

Basic Circuit Concepts

Voltage and current sources, Resistors in series and parallel, Inductors, Fixed and variable inductors, Self and mutual inductance, Faraday‘s law and Lenz‘s law of electromagnetic induction, Energy stored

in an inductor, Capacitors, Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant,Dielectric strength, Energy stored in a capacitor.

DC Transient Analysis

RC Circuit- charging and discharging, Growth and decay of current in RL Circuit, Time Constant, RL and RC Circuits with DC sources, DC Response of Series RLC Circuits.

AC Circuit Analysis

Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor, Phasor diagrams, Complex Impedance, Power in AC Circuits, Instantaneous Power, Average Power, Reactive Power, Power Factor.

Sinusoidal Circuit Analysis for RL, RC and RLC Circuits.Resonance in Series and Parallel RLC Circuits, Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth.

Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.

Circuit Analysis

Kirchhoff‘s Current Law (KCL), Kirchhoff‘s Voltage Law (KVL), Node analysis, Mesh analysis.

Network Theorems

Principal of Duality, Superposition Theorem, Thevenin‘s Theorem, Norton‘s Theorem, T and π types of networks, Image and Characteristic impedances, Maximum Power Transfer Theorem.

Two Port Networks: Impedance (Z) Parameters, Admittance (Y) Parameters.

Text and References:

A Text Book on Electrical Technology Vol-1, B. L.Theraja& R. K. Theraja, S. Chand.
Network Analysis, Van Valkenburg, Pearson.
Electronic Circuits, Schilling and Belove, TMH.
Electric Circuits, S. A. Nasar, Schaum’s outline series, Tata McGraw Hill (2004).
Electrical Circuits, M. Nahvi& J. Edminister, Schaum’s Outline Series, Tata McGraw-Hill (2005).
Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press.
Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.
Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning.
Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.

Core Course - I (Practical) LAB – I

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Verify network theorems using resistive networks and D.C. sources.
- Study response curve of LCR series resonance.
- Familiarize with basic electronic components (R, C, L, diodes, transistors),digital Multimeter, Function Generator and Oscilloscope.
- Determine the current through a resistance by potentiometer.
- Study I-V characteristics of a suitable resistor and that of a junction diode within specified limit on a graph, and hence to estimate d.c. and a.c. resistances of both the elements at the point of intersection.

Content/ Syllabus:

List of Experiments:

1. Familiarization with basic electronic components (R, C, L, diodes, transistors),digital Multimeter, Function Generator and Oscilloscope.

2. Determination of the current through a resistance by potentiometer.

3.Verification of (a) Thevenin's theorem and (b) Norton's theorem.

4. Verification of the Maximum Power Transfer Theorem.

5.Study of response curve of LCR series resonance.

6. Study ofI-V characteristics of a suitable resistor and that of a junction diode within specified limit on a graph, and hence to estimate d.c. and a.c. resistances of both the elements at the point of intersection.

Text and References:

Basic Electronics: A Text Lab Manual, Zbar, TMH.
Laboratory Manual for Electronic Devices and Circuits, Bell, PHI.
Laboratory Manual for Electric Circuits , Bell, PHI.
Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH.
Advanced Practical Physics Volume II B. Ghosh, New Central Book Agency.
An Advanced Course in Practical Physics, Chattopadhyay and Rakshit, New Central Book Agency(P) Limited.

SEMESTER – II

Course Name: Solid State Electronics

Course Code: BSCPELCC201

<table>
<tr><td colspan="2">Course type: Core
(Theory + Practical)</td><td colspan="2">Course details: CC-1(2)</td><td colspan="2">L-T-P : 4-0-4</td></tr>
<tr><td rowspan="3">Credit: 6</td><td rowspan="3">Full marks: 100</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>30</td><td>10</td><td>20</td><td>40</td></tr>
</table>

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Learn about semiconductor physics.
- Describe the behavior of semiconductor devices such as diodes, transistor, FET etc.
- Reproduce the I-V characteristics of Diodes/BJT/FET devices.
- Learn about the applications of p-n junction diodes.

Content/ Syllabus:

Core Course - II (Theory)
SOLID STATE ELECTRONICS

Semiconductor Physics
The atomic structure, Energy band diagram and classifications of solids, Metals insulators and semiconductors (Qualitative discussions only),Generation of hole-election pairs at room- temperature and intrinsic semiconductor, Energy band diagram, carrier density; doping and impurity semiconductor, majority and minority carriers, p-type and n-type semiconductors, advantage of silicon over germanium as semiconductor device material, Transport parameters, Current flow in semiconductors, Diffusion and Drift current.

Junction Diode and its applications
p-n junction and its properties (depletion region, barrier voltage, barrier width, junction capacitance and junction resistance), Junction diode, forward and reverse biased characteristics, diode equation (I-V

expression only), a.c. and d.c. resistances of a diode, Zener and avalanche breakdown. Qualitative idea of Schottky diode.
Use of diode as rectifier, calculation of ripple factor and efficiency of half and full wave rectifier, Filter-capacitor and inductance filters, their role in power supply, output waveform and working, Regulation-Line and load regulation, Zener diode as voltage regulator.

Bipolar Junction Transistor

Bipolar Junction Transistors (NPN & PNP), Principles of operation, Different modes of operations, Input and output characteristics of transistor in CE and CB configurations, Regions of operation (active, cut off and saturation), Current gains α and β, Relations between α and β, dc load line and Q point, Simple problems.
Biasing of BJT (PNP and NPN), idea of bias stability, Factors affecting Stability, Stability factor, Study of Fixed, Self and Voltage divider biasing.

Unipolar Devices

JFET, Construction, working and I-V characteristics (output andtransfer), Pinch off voltage, MOSFET (Enhancement and Depletion) and its characteristics.
UJT, basic construction, working, equivalent circuit and I-Vcharacteristics.

Reference Books:

Introduction to Solid State Physics, C.Kittel, John Wiley.
Integrated Electronics, Millman and Halkias, TMH.
Foundations of Electronics,Chattopadhyay and Rakshit, New Age.
Basic Electronics -Solid State,B.L.Theraja (Current Edition).
Principles of Electronics,V.K.Mehta (Current Edition).
Electronic Devices and Circuit Theory, R. L. Boylestad and L. Nashelsky, Pearson.
Basic Electronics & Linear Circuits, Bhargava, Kulashretha, Gupta, TMH.
Solid State Electronic Devices, Streetman & Banerjee, PHI.
Electronic Devices and Circuits, Salivahanan, TMH .
Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.
Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, Tata McGraw Hill.

Core Course - II (Practical) LAB – II

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Study P-N Junction diode characteristics, to calculate dc and ac resistances.

- Study Zener diode Characteristics in reverse bias, to determine breakdown voltage and ac resistance at breakdown.
- Study Transistor input & output characteristics (CE & CB Modes). To determine dc & ac resistances and current gain.
- Study mutual and drain characteristics of JFET, to determine JFET parameters and to verify their interrelation.
- Study half & full wave rectifier with junction diode with (capacitor) and without filter.
- Study voltage regulation using Zener diode.

Content/ Syllabus:

Solid State Electronics
List of Experiments:

1. Study of P-N Junction diode characteristics, to calculate dc and ac resistances.
2. Study of Zener diode Characteristics in reverse bias, to determine breakdown voltage and ac resistance at breakdown.
3. Study of Transistor input & output characteristics (CE & CB Modes). To determine dc & ac resistances and current gain.
4. Study of mutual and drain characteristics of JFET, to determine JFET parameters and to verify their interrelation.
5. Study of half & full wave rectifier with junction diode with (capacitor) and without filter.
6. Study of voltage regulation using Zener diode.

Text and References:

Basic Electronics: A Text Lab Manual, Zbar, TMH.
Laboratory Manual for Electronic Devices and Circuits, Bell, PHI.
Laboratory Manual for Electric Circuits , Bell, PHI.
Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH.
Advanced Practical Physics Volume II B. Ghosh, New Central Book Agency.
An Advanced Course in Practical Physics, Chattopadhyay and Rakshit, New Central Book Agency(P) Limited.

SEMESTER – III

Course Name: ELECTRONIC COMMUNICATION

Course Code: BSCPELCC301

Course type**: Core(Theoretical)**	Course details: **CC-1(3)**			L-T-P : **5-1-0**	
Credit: **6**	Full marks: **50**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		……..	**10**	**……..**	**40**

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Understand the basic concepts of a communication system.
- Understand radio wave propagation.
- Understand transmission techniques.
- Understand satellite communication.
- Understand baseband analog modulation.

Content/ Syllabus:

Radio Wave Propagation

Characteristics of electromagnetic wave, propagation of radio waves in different frequencies, structure of the atmosphere, ground wave propagation, sky wave, critical frequency and virtual height, maximum usable frequency and skip distance(qualitative discussions only)

Electronic communication

Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI).Electromagnetic communication spectrum, band designations and usage.Channels and base-band signals.Concept of Noise, signal-to-noise (S/N) ratio.

Analog Modulation

Amplitude Modulation, modulation index and frequency spectrum.Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM

Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver.

Satellite Communication

Introduction, need, Geosynchronous satellite orbits, geostationary satellite, advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

SKILL ENHANCEMENT COURSE

Course Name: Design and fabrication of electronic circuits

Course Code: BSCPELCSE301

<table>
<tr><td colspan="2">Course type: SE</td><td colspan="2">Course details: SEC-1</td><td colspan="2">L-T-P : 0-0-8</td></tr>
<tr><td colspan="2" rowspan="3">Credit: 4</td><td rowspan="3">Full marks: 50</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>30</td><td>……</td><td>20</td><td>……</td></tr>
</table>

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Learn about electronic/electrical components, resistor, capacitor, inductor, transformer, signal sources (ac and dc), transistor, FETs, op-amps.

- Design CE AF amplifier on broadband, design of Zener Diode regulator, FET audio amplifier, feedback amplifier, design of low frequency oscillator, various Op-Amp circuits, modulator and demodulator.
- Construct radio receiver, square wave generator.

Content/ Syllabus:

SEC - 1

Design and Fabrication of electronic circuits

- Knowledge of electronic/electrical components, resistor, capacitor, inductor, transformer, signal sources (ac and dc), transistor, FETs, op-amps.

- Design of CE AF amplifier on broadband, design of ZenerDiode regulator, FET audio amplifier, feedback amplifier, design of low frequency oscillator, various Op-Amp circuits, modulator and demodulator.

  Construction of radio receiver, square wave generator.

References:

Basic Electronics: A Text Lab Manual, Zbar, TMH

Laboratory Manual for Electronic Devices and Circuits, Bell, PHI Laboratory Manual for Electric Circuits , Bell, PHI

Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH

SEMESTER – IV

Course Name: ANALOG ELECTRONICS CIRCUIT

Course Code: BSCPELCC401

Course type**: Core (Theory + Practical)**	Course details: **CC-1(4)**			L-T-P : **4-0-4**	
Credit: **6**	Full marks: **100**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	**10**	**20**	**40**

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Learn about feedback amplifiers.
- Learn about power amplifiers, tuned amplifiers. .
- Explain concepts of different oscillators.
- Learn about OP Amp and its applications.

Content/ Syllabus

Analog Electronics (Theory, Credit - 4)

Feed back in Amplifier: General theory of feedback, negative and positivefeedback, advantages of negative feedback, types of negative feedback intransistor amplifiers, current series, voltage series, current shunt – voltageamplifier (qualitative discussion only).

Voltage and Power amplifiers: Class A, B, C and AB amplifiers, Class-B Push pullamplifier, RC coupled, Transformer coupled amplifiers (qualitative discussiononly).

Oscillators: Positive feedback and oscillation, BarkhausenPrinciple,CollectorTuned Oscillator,

Phase shift oscillator, Crystal Oscillator. (qualitative discussiononly), basic idea of Multivibrators,

Operational Amplifier: Differential Amplifier, CMRR, Characteristics of ideal OPAmp, Inverting &noninverting amplifier, Adder, Integrator and Differentiatorcircuits using Op Amp.

References :

Integrated Electronics, Millman and Halkias, TMH.

Electronic Principles, Malvino, TMH .

OP-Amp and Linear Integrated circuits, Gaykwad, Pearson.

Foundations of Electronics ,Chattopadhyay and Rakshit New Age International.

Analog Electronics : Devices and Circuits , B.C. Sarkar and S. Sarkar, Damodar

Group, Burdwan.

Electronics, V.K.Mehta

Basic Electronics, B.L.Theraja

Electronics, B.Ghosh

Analog Electronics, DSC - ID Lab –III (Credit : 2)

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- To draw the static characteristics of P-N-P and N-P-N transistors in CB, CE, modes.
- To study JFET characteristics
- To study transistor CE amplifier.
- To study Op AMP inverting amplifier.
- To study adder using Op AMP.

Content/ Syllabus

Analog Electronics, DSC - ID Lab –III (Credit : 2)

1. To draw the static characteristics of P-N-P and N-P-N transistors in CB, CE, modes.
2. To study JFET characteristics
3. To study transistor CE amplifier.
4. To study Op AMP inverting amplifier.
5. To study adder using Op AMP.

References:

Basic Electronics: A Text Lab Manual, Zbar, TMH

Laboratory Manual for Electronic Devices and Circuits, Bell, PHI Laboratory Manual for Electric Circuits , Bell, PHI

Electric Circuits: Schaum's Outlines, J. Edminister and M. Nahvi, TMH. Practical Physics ,Rakshit and Chattopadhyay

Advanced Practical Physics Volume II B. Ghosh, New Central Book Agency.

SKILL ENHANCEMENT COURSE

Course Code: BSCPELCSE401

<table>
<tr><td colspan="2">Course type: SE</td><td colspan="3">Course details: SEC-2</td><td colspan="2">L-T-P : 0-0-8</td></tr>
<tr><td rowspan="3">Credit: 4</td><td rowspan="3">Full marks: 50</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>30</td><td>……</td><td>20</td><td>……</td></tr>
</table>

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Understand concept of household wiring.
- Learn about repairing of domestic appliances.

Content/ Syllabus

SEC - 2

Household wiring and repairing of domestic appliances

1. Concept of house wiring, use of fuses, protection devices, etc, choice of wires depending on the current consumption, parallel connections, knowledge of LEDs, CFLs, use of heat-sinks, calculation of loads.

2. Repairing and servicing of refrigerator, μwave oven, induction heater, gas stoves, geyser, battery maintenance and repairing of charging devices, coil winding of fans, grinder-mixer repairing.

SEMESTER – V

SKILL ENHANCEMENT COURSE

Course Name- Electronics: Digital Circuit

Course Code: BSCPELCSE501

Course type**: SE**	Course details: **SEC-3**			L-T-P : **0-0-8**	
Credit: **4**	Full marks: **50**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	……	**20**	**……**

Course Learning Outcomes:

After the completion of course, the students will have ability to :

- Design clock frequency generator
- Know how to design a decade counter
- Explain the working of R-S flip-flop.
- Understand the design and working of Master-Slave flip-flop.

Content/Syllabus:

1) Design and study of clock frequency generator.
2) Study of R-S flip-flop.
3) Study of decade counter.
4) Study of Master-Slave flip-flop.

DISCIPLINE SPECIFIC ELECTIVES (DSE)

(Any one from A & B)

A.

Course Name: Digital Electronics

Course Code: BSCPELCDSE501

Course type**: DSE** **(Theory + Practical)**	Course details: **DSE-IA**			L-T-P : **4-0-4**	
Credit: **6**	Full marks: **100**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	**10**	**20**	**40**

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Understand and represent numbers in powers of base and converting one from the other.
- Carry out arithmetic operations using number systems.
- Understand basic logic gates.
- Understand concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions.
- Analyze and design combinational as well as sequential circuits.

Content/Syllabus:

Number Systems: Decimal numbers, binary number, octal numbers,hexadecimalnumbers, BCD numbers (weighted and unweighted codes),Excess three code,

Gray code, parity conversions, arithmetic operations,ASCII, Extended ASCII codes,9's and 10's complement code.

Boolean algebra: Boolean relations, commutative, associative anddistributive

laws, OR, AND, and NOT operations, De Morgan theorems.

Logic Gates: Inverters, OR, AND and NOR gates, EX-OR and EX-NORgates,Simplification of Boolean expressions using Boolean algebra andDe-Morgan's theorems, sum of products and product of sums forms,Karnaugh-map, NAND and

NOR gates as universal building blocks.

Combinational Logic: Binary adder, half adder, full adder, Multiplexer

andDemultiplexer

Sequential Circuits: Latches, Flip-flops, R-S flip-flop, J-K flip-flop, Master -slave

flip-flop, D flip-flop, T flip-flop.

References :

Digital Logic and Computer Design, Mano , Pearson.

Digital computer electronics, Malvino and Brown, Tata McGraw Hill.

Digital Principles, Leach and Malvino , TMH.

Modern Digital Electronics, Jain, TMH.

Digital Circuits, Vol-I and II, D.RoyChaudhuri, Platinum publishers .

A text book of digital electronics, Sedha, S. Chand.

DIGITAL ELECTRONICS DSE-IA (Practical), Lab. (Credit : 2)

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Study the Logic Gates.
- Design complex digital logic circuits using universal gates.
- Simplify a given SOP & POS circuits.
- Study Karnaugh map.

Syllabus:

1. Study of basic logic gates.
2. Study of universal logic gates.
3. Simplification of SOP and POS circuits.
4. Study of Karnaugh map.

B.

Course Name: Optical Communication

Course Code: BSCPELCDSE502

<table>
<tr><td colspan="2">Course type: DSE
(Theory + Practical)</td><td colspan="2">Course details: DSE-IA</td><td colspan="2">L-T-P : 4-0-4</td></tr>
<tr><td rowspan="3">Credit: 6</td><td rowspan="3">Full marks:
100</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>30</td><td>10</td><td>20</td><td>40</td></tr>
</table>

Course Learning Outcomes:

After the completion of course, the students will have ability to:

- Learn basics of optoelectronic processes
- Identify the types of optoelectronics devices and explain their characteristics and working principle
- Learn basic of optical fiber communication, optical fiber materials, structure, modes in optical fibers etc.
- Familiarized with optical fiber losses, attenuation, dispersion, EM wave propagation

Content/Syllabus:

Optoelectronics : Characteristics of optical emission, electro-luminescence. LED:Power and efficiencycalculation, Structure of LED and its characteristics, Hetero-junctionLED,Photo diode: PIN photodiode, hetero junction diode, Avalanche Photo diode, Phototransistor. LDR, photovoltaic cells, photo emissive cells - types, materials, construction, response, opto-couplers –characteristics, noise figures,

applications in analogue and digital devices. (30)

Fiber optics: Optical fibre–materials, construction, step index and graded indexfibres, ray propagation,attenuation. Modes in optical fibres, intermodal dispersion, singlemodefibre-working principle, attenuation, dispersion and bandwidth. Multimode fibre- attenuation, dispersion.Propagation of EM waves,

Fibre coupling. (20)

References :

Semiconductor Opto Electronics Devices, P. Bhattacharya .

Optoelectronics and Fiber Optic Communication, D C Sarkar and C K Sarkar, New Age.

Photonics : A Yariv and P Yeh. Oxford.

Optical Electronics : By Ghatak and Thyagrajan , Cambridge University Press.

OPTICAL COMMUNICATION DSE-IA (Practical), Lab. (Credit : 2)

Course Learning Outcomes:

(After the completion of course, the students will have ability to) :

- Study the Laser diode and its working
- Study single mode fibre and its workings
- Do measurement of power, frequency & attenuation and numerical aperture

Syllabus:

1) Study of Laser diode and Single mode optical fibre:- Measurement of Power, Frequency & attenuation, and Numerical aperture.

SEMESTER – VI

SKILL ENHANCEMENT COURSE

Course Name- Electronics: Design and Study of DC power supplies using ICs

Course Code: BSCPELCSE601

Course type**: SE**	Course details: **SEC-4**			L-T-P : **0-0-8**	
Credit: **4**	Full marks: **50**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	……	**20**	**……**

Course Learning Outcomes:

After the completion of course, the students will have ability to :

- Design a DC power supplies using ICs and explain its working

Content/Syllabus:

1) **Design and study of DC positive & negative power supplies using ICs.**

DISCIPLINE SPECIFIC ELECTIVES (DSE)

(Any one from A & B)

A.

Course Name: RADIO AND TELEVISION

Course Code: BSCPELCDSE601

Course type**: DSE** **(Theoretical)**	Course details: **DSE-IB**			L-T-P : **5-1-0**	
Credit: **6**	Full marks: **50**	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
			10	**…..**	**40**

Course Learning Outcomes:

After the completion of course, the students will have ability to:

- Learn basics features of communication system, especially radio communication, types of radio waves, classification of radio receivers
- Understand the electromagnetics of radio wave, modes of propagation, free space propagation, ionospheric wave propagation and their characteristics
- Acquire knowledge about basic Television system, television broadcasting, coverage of television, scanning principles etc.

Content/Syllabus:

Radio Communications: Introduction, basic requirements of radio communications, communication systems, basic features of communication: transmitter, receiver, classification of radio waves, ordinary receiver and super heterodyne receiver.

Radio wave propagation: Introduction, electromagnetic or radio waves, freespace propagation, modes of propagation, ground wave and surface wave, sky wave or ionospheric wave, space wave propagation, tropospheric scatter propagation, sky wave propagation, maximum usable frequency, skip distance duct propagation.

Television: Introduction–Historical development, television broadcasting,coverage of television, Basic television system and scanning principles, Essentials Of colour television.

References:

Antenna and wave propagation, K D Prasad, SatyaPrakashan

Electromagnetic field theory, K AGangadhar, P M Ramanathan, Khanna Publication.

Electromagnetic field theory, S P Ghosh, McGraw Hill.

Principles of electromagnetics, M.N.O. Sadiku, Oxford.

Monochrome and colour television, R.R. Gulati, New Age International.

Television and video engineering, A M Dhake, Tata McGraw Hill.

Colour television, principles and practice, R RGulati, New Age International.

Electronic (classical and modern), R K Kar, Books & Allied (P) Ltd.

B.

Course Name: MEASUREMENTS and INSTRUMENTATION

Course Code: BSCPELCDSE602

<table>
<tr><td colspan="2">Course type: DSE (Theoretical)</td><td colspan="2">Course details: DSE-IB</td><td colspan="2">L-T-P : 5-1-0</td></tr>
<tr><td rowspan="3">Credit: 6</td><td rowspan="3">Full marks: 50</td><td colspan="2">CA Marks</td><td colspan="2">ESE Marks</td></tr>
<tr><td>Practical</td><td>Theoretical</td><td>Practical</td><td>Theoretical</td></tr>
<tr><td>…..</td><td>10</td><td>….</td><td>40</td></tr>
</table>

Course Learning Outcomes:

After the completion of course, the students will have ability to:

- Explain the basic working principle of various electronic measurement instruments used to measure electrical parameters like current, voltage, power etc.
- Understand and describe the specifications, features, characteristics, error and the performance of an instrument
- Learn about various types AC bridges and their applications in measurements of capacitance, frequency, inductance etc.

- Gain knowledge about the functional blocks of a CRO and do analysis, measurements of waveform display
- Explain working of various types of sensors, transducers and their applications

Content/Syllabus:

Basic Measurement Instruments: PMMC instrument, galvanometer, DCmeasurement - ammeter, voltmeter, **o**hm meter, AC measurement. (10)

Connectors and Probes: Low capacitance probes, high voltage probes, currentprobes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc.

(basic idea only). (5)

AC Bridges: Wheatstone bridge method, A.C. bridges, Measurement of SelfInductance, Maxwell's bridge, Measurement of Capacitance, Schering's bridge, Measurement of frequency, Wien's bridge (qualitative discussion only). (10)

Oscilloscopes: CRT, wave form display and electrostatic focusing, time base andsweep synchronization, measurement of voltage, frequency and phase by CRO.

(10)

Transducers and Sensors: Classification of transducers, Basicrequirement/characteristics of transducers,active& passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive, Inductive (LVDT) and piezoelectric transducers. Measurement of temperature, Optical transducers (photoresistors, photovoltaic

cells, photodiodes). (15)

References :

Modern Electronic Instrumentation and Measurement Techniques, Helfrick and Cooper,Prentice-Hall of India, Reprint 1988.

Instrumentation Measurement and Feedback, Jones, B.E., Tata McGraw-Hill, 1986.

Electrical Measurement and Measuring Instruments, Golding, E.W., 3rd Edition, Sir Issac Pitman and Sons, 1960.

Measurement Systems: Application and Design, DoebelinE.O. , McGraw Hill Book - Fifth Edition (2003).

Principles of Electrical Measurements, Buckingham, H. and Price, E.N., 1961.Test and measuring instruments

Electronic Instrumentation, Kalsi, Tata McGraw Hill (2006)

A Course on Electrical and Electronic Measurements and Instrumentations, A K Sawhney, DhanpatRai& Sons.

DISCIPLINE SPECIFIC ELECTIVES (DSE) : Lab

DSE- IB: **Credit – 2**

Course Learning Outcomes:

After the completion of course, the students will have ability to:

- Do measurement of signal characteristics using Oscilloscope
- Do measurement of pressure, temperature, strain etc. using various sensors and transducers

Syllabus:

Measurement of signal characteristics by oscilloscope. Use of sensors / transducers for measurement of pressure, temperature, photo-resistors, and strain.