PROGRAMME OUTCOME OVERVIEW (CBCS SYLLABUS)

Of

LADY BRABOURNE COLLEGE, KOLKATA

AFFILIATED TO THE UNIVERSITY OF CALCUTTA

Lady Brabourne College is an educational institution disseminating knowledge for General Degree of M.A & M.Sc and B.A & B.Sc as per the Syllabus structured and approved by the affiliating University, the University of Calcutta (CU).

VISION OF THE INSTITUTION: Woman empowerment. The idea is to open dissemination of the CU syllabus to a wide cross section of women learners and prepare them

a) for independent thinking and decision making process as future young Indians
b) for pursuing Higher Education
c) for immediate employment in case of certain stakeholders

VISION IMPLEMENTATION PLAN

- The Institution tries to fulfill this objective within the framework of the structured CU Syllabus.
- All the departments of the College dedicate themselves to the overall vision.
- The dissemination process simultaneously remains vigilant to strengthen the pure knowledge base of each specific discipline so that academic proficiency pursues a continuous upward curve.

REFERENCE POINTS

a) Participative outcomes in seminars, workshops, educational excursions
b) Rank List [http://www.ladybrabourne.com/AQARNEW/AQAR2019-20/Ranklist2019-20]
c) Career Counselling cell

Department of English

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for English (Honors) (CBCS)

(with effect from 2018)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• To acquaint learners with advanced level knowledge of: Literatures in English; English as a language of diverse literatures and English as basis for Skill Enhancement in multiple areas of life and livelihood,
PO B	• To acquaint learners with the geographical and cultural contexts of English Literature through the study of British and other European, Indian and other Asian, American, African and Australian literatures in English or in English translations. • To acquaint the learner with the history of English as a contemporary global language
PO C	• To acquaint learners with the foundational fictions of European Literature. Reference CCII. • To acquaint learners with the early literature of Britain. CC IV • To acquaint learners with the Literature of Britain during its periods of colonial expansion and empire and up to the present. Reference Papers CC-VII, VIII, IX, X and XII
PO D	• To acquaint learners with usage of English as medium of everyday communication, English as a language of creative and effective expression.
PO E	• To prepare the learner with linguistic skills, with comprehensive knowledge of society and culture, with overall understanding of the world and life processes, with specific business, academic and creative writing skills to find careers in a great variety of fields. To thus empower them with great employment potential.

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PO D	• To acquaint learners with usage of English as medium of everyday communication, English as a language of creative and effective expression.
PO E	• To prepare the learner with linguistic skills, with comprehensive knowledge of society and culture, with overall understanding of the world and life processes, with specific business, academic and creative writing skills to find careers in a great variety of fields. To thus empower them with great employment potential.

Mapping of PO & PSO for English Hons Syllabus of 2018 of the University Of Calcutta

PSO	PO				
	A	**B**	**C**	**D**	**E**
1	√	√	√	√	√
2	√	√	√	√	√
3	√	√	√	√	√
4	√	√	√	√	√

Programme Outcome for Partial Semester wise Courses in English Honours under University of Calcutta

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
SEMESTER 1 **CC 1 & 2** **CC1** – **History of Literature And Philology** **CC2** –European Classical Literature **AECC1** (Communicative English/MIL),	**CC1** Group A: History of Literature	**A**	**B**	**C**	**D**	**E**
	Group B: Philology	√	√	√	√	√
	CC 2 Group A: Social and intellectual background	√	√	√	√	√
	Group B: Homer, Sophocles,	√	√	√	√	√
	Group C: Ovid, Plautus , Horace	√	√	√	√	√
	AECC1 CREDITS					
	• Correction of sentences **• Transformation (Simple, Complex and Compound Sentences; Degrees of Comparison; Affirmative and Negative Sentences; Interrogative and Assertive Sentences; Exclamatory and Assertive Sentences)** **• Identifying True/False Statements from Given Passages**			√	√	√

TABLE II

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
Semester II **CC III:Indian Writing in English** **CC IV:British Poetry And Drama (14th – 17th Century):**	**CC III**	**A**	**B**	**C**	**D**	**E**
	Poetry: Derozio, Toru Dutt, Kamala Das, A.K. Ramanujan , Nissim Ezekiel, JayantaMahapatra	√	√	√	√	√
	Novel Bankimchandra Chattopadhyay: *Rajmohan's Wife*	√	√	√		√
	Drama Mahesh Dattani, *Bravely Fought the Queen*	√	√	√		√
	CCIV					
	Social and Intellectual Background	√	√	√		√
	Poetry: Geoffrey Chaucer, Edmund Spenser, William Shakespeare, Sonnets , John Donne, Andrew Marvell	√	√	√		√
	Drama: Christopher Marlowe, William Shakespeare	√	√	√		√

TABLE III

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
Semester III	**CC V**	**A**	**B**	**C**	**D**	**E**
CC V American Literature	**Poetry:**					
	Robert Frost, alt Whitman, Sylvia Plath, Langston Hughes, Edgar Allan Poe	√	√	√	√	√
	Novel: Ernest Hemingway, The Old Man and the Sea	√	√	√	√	√
	Stories					
	Edgar Allan Poe, F. Scott Fitzgerald, William Faulkner	√	√	√	√	√
	Drama: Arthur Miller, Death of A Salesman	√	√	√	√	√
	CC VI					
CC VI: Popular Literature	Lewis Carroll, Agatha Christie, Sukumar Ray, Herge	√	√	√	√	√
	CC VII					
CC VII: British Poetry And Drama (17th – 18th Century Popular Literature	**Poetry** John Milton, Alexander Pope	√	√	√	√	√
	Drama John Webster:*The Duchess of Malfi* AphraBehn: *The Rover*	√	√	√	√	√

TABLE IV

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
Semester IV	**CC VIII**	**A**	**B**	**C**	**D**	**E**
18th Century British Literature CC VIII	Social and Intellectual Background	√	√	√		√
	Poetry: Samuel Johnson, Thomas Gray,	√	√	√		√
	Drama William Congreve	√	√	√		√
	Prose (Fiction & Non-Fiction) Daniel Defoe, *Robinson Crusoe* Joseph Addison, 'Sir Roger at Home' and 'Sir Roger at Church	√	√	√		√
CC IX British Romantic Literature	**CC IX**					
	Social and Intellectual Background	√	√	√		√
	Poetry William Blake, William Wordsworth, Samuel Taylor Coleridge,	√	√	√		√

CC X : 19th Century British Literature	Percy Bysshe Shelley, John Keats,					
	Prose (Fiction & Non-Fiction) Charles Lamb: Essays; Mary Shelley:*Frankenstein*	√	√	√		√
	CC X					
	Social and Intellectual Background	√	√	√		√
	<u>Poetry</u> Lord Tennyson, Robert Browning, Christina Rossetti, Matthew Arnold,	√	√	√		√
	Novel: Jane Austen /Charlotte Bronte; Charles Dickens/ Thomas Hardy	√	√	√		√

TABLE V

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester V	**CC XI**	**A**	**B**	**C**	**D**	**E**
CC XI: Women's Writing	**Fiction** Alice Walker/ Emily Bronte; Mahasweta Devi, 'Draupadi', translated GayatriChakravortySpivak; Katherine Mansfield	√	√	√		√
	Non-Fiction Mary Wollstonecraft, *A Vindication of the Rights of Woman*, Chapters I & II Rassundari Devi, *Amar Jiban*	√	√	√		√
	CC XII					
CC XII: Early 20th Century British Literature	**Social and Intellectual Background**	√	√	√		√
	Poetry: T.S. Eliot; W.B. Yeats; Wilfred Owen	√	√	√		
	Fiction Joseph Conrad; D.H. Lawrence,	√	√	√		√
	Drama: George Bernard Shaw	√	√	√		√
	DSE-A1					

DSE-A1 – Modern Indian Writing In English Translation	**<u>Stories</u>** MunshiPremChand;IsmatChugtai; Fakir Mohan Senapati **<u>Poetry</u>** Rabindranath Tagore;G.M. Muktibodh; Amrita Pritam **<u>Novel</u>** Rabindranath Tagore **<u>Drama</u>** **Vijay Tendulkar**	√	√	√		√
DSE-A2 - Literary Theory	**DSE-A2**					
	Literary Theory: Antonio Gramsci, 'The Formation of the Intellectuals' from *The Prison Notebooks* Virginia Woolf: *A Room of One's Own* Rabindranath Tagore:'Nationalism in India'	√	√	√		√
	Literary Criticism William Wordsworth: 'Preface' to the *Lyrical Ballads* S.T. Coleridge: *BiographiaLiteraria*, Chapters XIII and XIV T.S. Eliot: 'Tradition and the Individual Talent	√	√	√	√	√
DSE-B1– Literary Types, Rhetoric And Prosody	**DSE-B1**					
	Group – A: Literary Types **Tragedy** (Tragic Hero, Catharsis, Heroic Tragedy, Chorus) **Comedy** (Romantic Comedy, Comedy of Humours, Comedy of Manners, Sentimental Comedy) **Short Story**	√	√	√		
	Group – B: Rhetoric		√	√	√	√
	Group – C: Prosody		√	√	√	√
DSE-B2 Contemporary India: Women And	**DSE-B2**					
	Social Construction of Gender	√	√	√		
	History of Women's Movement in India (pre-independence and post-independence)	√	√	√		
	Women and Law: Domestic Violence, Female Foeticide, Sexual Harassment	√	√	√		

Empowerment	Dalit Women and Double Marginalisation	√	√	√		

TABLE VI

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester VI	**CC XIII**	**A**	**B**	**C**	**D**	**E**
CC XIII Modern European Drama	Henrik Ibsen; Bertolt Brecht; Samuel Beckett	√	√		√	√
	CC XIV					
CC14 Postcolonial Literatures	**Poetry:** Pablo Neruda; Derek Walcott; David Malouf; Mamang Dai	√	√		√	√
DSE-A3 Partition Literature	**DSE-A3**					
	Novel: Amitav Ghosh: *The Shadow Lines*	√	√		√	√
	Short Stories: ProtivaBasu, Manik Bandyopadhyay, Sadat Hasan Manto	√	√		√	√
OR	**Poetry** SahirLudhianvi; Birendra Chattopadhyay; Sankha Ghosh	√	√	√	√	√
DSE-A4 Media And Communication Studies	**DSE-A4**					
	Introduction to Mass Communication		√		√	√
	Mass Communication and Globalisation	√	√	√	√	√
DSE-B3 Autobiography	Writing Pamphlets, Posters etc	√	√	√	√	√
	Advertisements and Creating Advertisements	√	√	√	√	√
OR	**DSE-B3**					
DSE-B4 Text And Performance	Rabindranath Tagore; Mahatma Gandhi; BinodiniDasi; Nirad C. Chaudhuri	√	√	√		√
	DSE-B4					
	Historical Overview of Indian and Western Theatre	√	√	√	√	√
	Classical, Modern and Contemporary Theatres	√	√	√	√	√
	Historical Developments of Theatrical Forms	√	√	√	√	√
	Folk Traditions	√	√	√	√	√

Department of History

Model Reference: University of Calcutta, Syllabus for History (Hons)

(with effect from 2018-19)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• Introducing learners to theoretical discourses and in-depth studies in History with reference to sources.
PO B	• To acquaint the students with the political, social, economic and cultural history of Indian subcontinent and the world, like the History of Europe, USA, East Asia and South East Asia. • To acquaint learners with the Regional History also, specifically the history of Bengal. DSE papers provide this opportunity. • To acquaint the learners with the concept of Art History.The learners are introduced in this field through SEC- II. .
PO C	• To enable learners to have varied experiences of human journeys from the prehistoric times to the contemporary world highlighting the transition from ancient to medieval to modern period.
PO D	• To acquaint learners with the varied openings of future research activities in archaeology, archival studies and museology with the main courses of Historical studies. Particularly SEC-I gives this opportunity to the students.

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	• To be able to understand the importance of sources as primary material of reconstructing the past; • To realize that history is a dynamic thought process which is based on the outcome of continuous research and excavations of archaeological sites as well as different interpretations on the progress and evolution of human civilization.
PSO 2	• To explore and understand different trends and trajectories in the history of India and the world across the centuries. • To enable the learner to study maps and visit museums for a clear understanding of places and artifacts.SEC papers are very helpful in this regard.
PSO 3	. • To equip the learner with a skill to determine the present and shape the future on the basis of the knowledge of the past. A good student of history with the awareness of a global citizen can pursue a career of researcher, archaeologist, museologist, and with leadership qualities can become a manager or administrator or even of a tour guide. This career option is one of the most valuable outputs of the course.
PSO 4	• To be acquainted with front level ICT tools for Seminar presentation. • Internal assessments help the learners and the teachers to assess the progress properly and regularly.

Mapping of PO & PSO for History Hons CBCS Syllabus of 2018-19 of CU.

PSO	PROGRAMME OUTCOMES				
	A	B	C	D	
1	√	√	√	√	
2	√	√	√	√	
3	√	√	√	√	
4	√	√	√	√	

Programme Outcome for CBCS Semester wise Courses in History Honours 2018-19 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME**			
		A	**B**	**C**	**D**
SEMESTER-I **2018 (July-December)** **Hons, CC- 1**	HISTORY OF INDIA FROM THE EARLIEST TIMES TO C 300 BCE	√	√	√	
CC- 2					
	SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA	√	√	√	√

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME**			
		A	**B**	**C**	**D**
SEM-II **2019 (January-June)** **CC-3**	HISTORY OF INDIA C300	√	√	√	√

	BCE TO C750 CE				
CC-4					
	SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD OTHER THAN INDIA	√	√	√	√

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME**			
SEM III		**A**	**B**	**C**	**D**
2019 (July-December) **CC- 5**	HISTORY OF INDIA CE 750-1250	√	√	√	√
CC- 6	RISE OF THE MODERN WEST-I	√	√	√	√
CC- 7	HISTORY OF INDIA C. 1206-1250	√	√	√	√
SEC-A (I)	ARCHIVES AND MUSEUM	√	√	√	√

TABLE IV

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME			
SEM-IV 2020 (January – June)		**A**	**B**	**C**	**D**
CC-8	RISE OF THE MODERN WEST-II	√	√	√	√
CC-9	HISTORY OF INDIA C. 1526-1605	√	√	√	√
CC-10	HISTORY OF INDIA C. 1605-1765	√	√	√	√
SEC-B(2)	ART APPRECIATION:AN INTRODUCTION TO INDIAN ART	√	√	√	√

TABLE V

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME			
SEM-V 2020 (July-December)		**A**	**B**	**C**	**D**
CC-11	HISTORY OF MODERN EUROPE (1780-1939)	√	√	√	√
CC-12	HISTORY OF INDIA (1750-1857)	√	√	√	√
DSE –A-1	HISTORY OF BENGAL (1757-1905)	√	√	√	√
DSE-B-1	HISTORY OF MODERN EAST ASIA-I-CHINA (1840-1949)	√	√	√	√

TABLE VI

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME**			
SEM-IV 2021 (January-June)		**A**	**B**	**C**	**D**
CC-13	HISTORY OF INDIA (1857-1964)	√	√	√	√
CC-14	HISTORY OF WORLD POLITICS (1945-1994)	√	√	√	√
DSE-A-3	HISTORY OF BENGAL (1905-1947)	√	√	√	√
DSE-B-3	HISTORY OF MODERN EAST ASIA –II- JAPAN (1868-1945)	√	√	√	√

Department of Bengali

UNDERGRADUATE SECTION

PROGRAMME OUTCOME OVERVIEW OF

B.A. IN BENGALI LITERATURE

LADY BRABOURNE COLLEGE, KOLKATA

(with effect from July 2018)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• To acquaint learners with advanced level knowledge of Bengali as language of literature, of philosophy of literature in Bengali, of Bengali as basis for skill enhancement
PO B	• To acquaint rhetoric and metre of poetry to reveal the full form of literature Reference Paper: CC-4-9 (Module 1 and 2)
PO C	• To grow interest in learners' mind about the relationship between theory and literature Reference Paper: CC-4-9 (Module 3)
PO D	• To acquaint learners about the types of literature Reference Papers: CC-5-11 (Module 1, 2 and 3)
PO E	• Introducing learners to acquaint with other literature: a) Hindi (literature, history of literature and literary works as poem and short story) b) English (history of literature) c) Sanskrit (history of literature) Reference Paper: CC-6-14 (Module 1, 2 and 3)
PO F	• To acquaint the learners with the cultural progression from the very beginning of Bengali language and literature to modern age highlighting the political history of Bengal Reference Papers: Discipline Specific Elective Course DSE-A-5-1 (Module 1, 2 and 3)
PO G	• Introducing the Literature of Bangladesh for the completion of realization of Bengali literature as a whole • Introducing detective, science fiction and supernatural stories which

	helps the learners to find the literary values of such stories which they used to read from their childhood Reference Papers: Discipline Specific Elective Course DSE-A-6-3 (Module 1, 2 and 3)
PO H	• Introducing skill enhancement course on printing and publication, script writing and the interrelation between literature and film Reference Papers: SEC-A-3-1, SEC-A-3-2 (Module 1, 2 and 3 each)

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To be able to understand the importance of the language as the fundamental basis of literature, connected with the evolution of human thought and civilization. • To be able to relate society and literature together and make the learners' mind equipped to the idea that literature also has a definite root of socio-economic background, not only the God-gifted genius. This realization makes the learners' mind analytical, scientific, reasonable and this clarity of mind helps him/her in advanced level education / research work in future.
PSO 2	• Knowledge of prosody and rhetoric awaken the learners' realization of literature's completeness from that point the wholeness of life itself. This philosophy of life prepare the learner to leave a meaningful life.
PSO 3	• History of literature and literary works of other languages help the learner to make an idea of comparative literature which in future helps him/her to proceed higher level of studies or research work. • Similarly, knowledge of stylistics is also necessary for learner to proceed his/her studies to linguistic department.
PSO 4	• CBCS Courses DSE introduces the Literature of Bangladesh and detective, science fiction and supernatural stories which helps the learners to find the literary values of such stories that helps him/her in future research works
PSO 5	• CBCS Course SEC introduces a course on printing and publication, script writing and the interrelation between literature and film which enhanced the learners' skill and helps him/her in the choosing jobs

Mapping of PO & PSO for Bengali Hons Syllabus of 2018-19 of CU.

PSO	PO							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1	√	√	√				√	√
2	√	√	√		√			
3	√		√	√				
4	√		√			√		
5	√					√	√	√

Programme Outcome for CBCS Semester wise Courses in Bengali Honours 2018-19

Under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
FIRST YEAR SEMESTER I (6 Months)	CC-1-1: History of Bengali Literature (10th to 18th Century) CC-1-2: Linguistics AECC-1: Poems and Short stories of Rabindranath Tagore	√	√				√		
FIRST YEAR SEMESTER II (6 Months)	CC-2-3: History of Bengali Literature (19th Century) CC-2-4: Bengali Literature (Poems, Novels, short stories and essays)	√	√	√			√		
SECOND YEAR SEMESTER III (6	CC-3-5: History of Bengali Literature (20th Century) CC-3-6: Linguistics CC-3-7: Novels and Short Stories	√	√	√	√		√		√

Months)	SEC-A-3-1: Printing and Publication SEC-A-3-2: Applied Bengali Literature – I								
SECOND YEAR SEMESTER IV (6 Months)	CC-4-8: Pre-modern age Literature CC-4-9: Metrics, Prosody and Theory CC-4-10: Essays and other Writing SEC-B-4-1: Applied Bengali Literature and Technology of Research SEC-B-4-2: Applied Bengali Literature – II	√	√	√	√		√		√
THIRD YEAR SEMESTER V (6 Months) THIRD YEAR SEMESTER VI (6 Months)	CC-5-11: Types of Literature CC-5-12: Drama and Theatre DSE-A-5-1: Social and Cultural History of Bengal DSE-A-5-2: Literature of Bangladesh DSE-B-5-1: Juvenile and Adolescent Literature DSE-B-5-2: Partition and Bengali Literature	√	√	√	√		√		
	CC-6-13: Modern Poems	√	√	√		√		√	

	CC-6-14: History of Literature (Sanskrit, English, Hindi) DSE-A-6-3: Detective, Science Fiction and Supernatural stories and novels DSE-A-6-4: Comparative Literature DSE-B-6-3: Biography, Autobiography and Travelogue DSE-B-6-4: Folk Culture and Literature								

Department of Bengali

POSTGRADUATE SECTION

PROGRAMME OUTCOME OVERVIEW OF

M.A IN BENGALI LITERATURE

LADY BRABOURNE COLLEGE, KOLKATA

(with effect from 2018-19)

The course entitled M.A in Bengali Literature is running successfully from September 2014 till date.

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• To acquaint learners with advanced knowledge of Bengali as language of literature, of philosophy of literature and Bengali as basis for skill enhancement Reference Papers: All
PO B	• To acquaint learners with advanced knowledge of linguistics Reference Papers: CC-1-1 (Module 1 to 3), CC-2-6 (Module 1 to 3)
PO C	• To acquaint learners about vast history of Bengali literature from social, cultural, eco-political and religious aspect Reference Papers: CC-1-2, CC-2-7 (Module 1 to 3 each)
PO D	• To acquaint learners the literature of Bengali from the beginning to modern poems, novels, short stories and essays of eminent writers (From 10^{th} Century to 20^{th} Century) Reference Papers: CC-1-3, CC-1-4, CC-1-5, CC-2-8, CC-2-9, CC-3-11, CC-4-13 (Module 1 to 3 each)
PO E	• To acquaint learners about the vast literature of Rabindranath Tagore – the world famous writer of Bengali literature • Learners get knowledge of eastern and western types of criticism and literary works. Reference Papers: CC-2-10, CC-3-12 (Module 1 to 3 each)
PO F	• The learners can choose one special paper among 7 discipline specific elective course that includes novel and short stories, dramas etc. Reference Papers: DSE (A to G)

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To enable the learners to relate cultures and evolution of human civilization with linguistics. Specially, Phonetic transcription of Bengali phonetics to IPA (International Phonetic Alphabet) trains the learners' listening ability and helps to acquaint similarity of IPA with that of Bengali language.
PSO 2	• DSE paper is very much important for their future study i.e. M.Phil and research work
PSO 3	• As the learners get opportunity to study the Bengali literature from beginning to modern and post-modern age, it gives them the idea of vastness and diversity of Bengali literature. The social and cultural evolution also become clear to the learners which grows clarity in thought and synthetical outlook of criticism.
PSO 4	• Students' can take linguistics for pursuing M.Phil, Ph.D or other diverse careers.

Mapping of PO & PSO for Bengali M.A. Syllabus of 2018-19 of CU.

PSO	**PO**					
	A	**B**	**C**	**D**	**E**	**F**
1	√	√	√	√	√	
2	√					√
3	√	√	√	√	√	√
4	√	√				

Programme Outcome for CBCS Semester wise Courses in Bengali M.A. 2018-19

Under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**					
		A	**B**	**C**	**D**	**E**	**F**
FIRST YEAR SEMESTER I (6 Months)	CC-1-1: Linguistics CC-1-2: Social, Cultural and Literary History of Bengal (Pre-modern) CC-1-3: Pre-modern Bengali Literature CC-1-4: Modern Bengali Poems CC-1-5: Bengali Drama	√	√	√	√		
FIRST YEAR SEMESTER II (6 Months)	CC-2-6: Linguistics CC-2-7: Social, Cultural and Literary History of Bengal (Modern) CC-2-8: Pre-modern Bengali Poem CC-2-9: Bengali Novels CC-2-10: Literature of Rabindranath Tagore - I	√	√	√	√	√	
SECOND YEAR SEMESTER III (6 Months)	CC-3-11: Bengali Short stories CC-3-12: Literature of Rabindranath Tagore - II DSE (D)-3-1: Novels and Short Stories	√		√	√	√	√

	DSE (D)-3-2: Novels and Short Stories DSE (E)-3-3: Theory and Literature of Drama DSE (E)-3-4: Theory and Literature of Drama						
SECOND YEAR SEMESTER IV (6 Months)	CC-4-13: Bengali Essay and Critical Literature CC-4-14: Eastern and Western Theory of Literature DSE (D)-4-3: Novels and Short Stories DSE (D)-4-4: Novels and Short Stories DSE (E)-4-3: Theory and Literature of Drama DSE (E)-4-4: Theory and Literature of Drama	√		√	√		√

Department of Urdu

Model Reference: University of Calcutta, CBCS Syllabus for Urdu (Hons)

(with effect from 2018-19)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• To provide the knowledge of the major traditions of literatures written in the national and international language like Hindi,Punjabi,Gujri and English etc for the diversity of literary and social voices within and sometimes marginalized by those traditions.To acquaint to read and appreciate various forms of literature • To create the basic and essential knowledge of Urdu language,literature with its terms.theories and devices and to impart the knowledge of the Urdu prose,poetry,fiction and critism. • To provide many words and meanings in literary texts to identify the difference between literary language and ordinary language. • Reference Paper 1&VIII
PO B	• To Acquaint the knowledge of Urdu language, literature on the background of its social and cultural history and understand the different views about Urdu language. Reference Paper I&VIII • To acquaint the learners with different movements which influence the Urdu literature such as Sir sayed Tahrik, Taraqqi pasand tahrik (Progressive movement), jaded tahrik ,Modernism and post modernism in Urdu poetry and learn famous Urdu ghazals poet,their poetry and its special features : Reference Paper I,VII &VIII
PO C	• To teach and create knowledge of the Urdu poetry and its various kinds Specially Urdu ghazal and Nazm as well as Marsiya,Qasida and Masnawi: Reference Paper I,IV&V
PO D	• To acquaint learners with the essence of Urdu prose,Dastan,Novel, Short Stories and Drama, and to create interest in prose such as letterwriting,eassy ,biography and sketch story and Learn about the major contribution of famous Urdu writers. • To impart the knowledge about the origin and development of literary criticism and to analyse prose and poetry: Reference Paper II,III&VI
PO E	• To acquaint the creativity in constrcting different literary forms and provide the arts and style of writing easy in Urdu and learn about Urdu mazamin: Reference Paper MIL (Urdu Compulsory)

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	• To be able to get knowledge about history of Urdu literature,its meaning and importance of major Urdu dialects. • To understand the different views and expansion about Urdu language and know about with its historical perspective. • To develop an ability to read texts in relation to their historical and cultural contexts, in order to gain a richer understanding of texts and context, and become more aware of themselves historically and culturally.
PSO 2	• To develop awareness about life through the study of Urdu literature and to know the sensitivity and respect towards the Urdu literature. • To design solutions for the problems to meet the specified needs with appropriate consideration for the cultural,social and environmental well being. • To learn to communicate effectively with society and are able to comprehend and write effective reports and design documentation,also make effective presentation and give and receive clear instruction,understand the importance of critical thinking,social interaction,effective citizenship,ethics,environment and sustainability and to acquire the ability to engage in independent and life-long Learning.
PSO 3	• To know about the syncretic genius and importance of Urdu culture,language and literature and to create the love and respect for values especially human values. • To gain the basic and essential knowledge in their language and to develop awareness about life through the study of Urdu literature.
PSO 4	• To be able to ignite the passion for learning teaching and employability based on human utility. • To be able to ignite the sense of elegance,dignity,magnanimity& delicacy and to spread awareness about the syncretic and synergetic genius and importance of Urdu culture& literature, • To promote and protect the creativity and originality and to promote communicative skills to become successful in the market and society.

Mapping of PO & PSO for Urdu Hons Syllabus of CBCS 2018-19 of CU.

PSO	PO				
	A	**B**	**C**	**D**	**E**
1	√	√	√	√	√
2	√	✓		√	√
3	√	√			✓
4	√	✓	✓	√	

Programme Outcome for Partial Semester wise CBCS Courses in Urdu Honours 2018-19 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
2018 Sem -1 Hons Paper CC-1	1.Linguistic : Difination and kinds of linguistic The history of Urdu language from its origins to the development of Urdu literature.The development of Indo-Aryan language. Different views according to Urdu language and its origin.	✓	✓		✓	
	2.The beginning and Maturing of Urdu in Dacceni and Shumali Hind	✓	✓	✓	✓	
	3.The aegis of Fort William College and Delhi College. 4.western affect after 1857.	✓	✓	✓	✓	

	4.western effects after 1857.	✓	✓	✓	✓	
	5.New trends in literature,Anjuman Punjab,Sir Sayed movement,patriotic poetry .The progressive movement and its Affect.	✓	✓	✓	✓	
	6.The history of Journalism	✓	✓	✓	✓	
	7.The art of Humorous (Tanz-o-Mizah).	✓	✓	✓	✓	
	8. The Modernity. (RTC)	✓	✓	✓	✓	

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
2018		**A**	**B**	**C**	**D**	**E**

Hons Paper **SEM-1** **CC-2**	1.Urdu ghazal in deccan and shumali hind , Urdu ghazal in lukhnow	✓	✓	✓	✓	
	2.The classical ghazal A great changing in Urdu ghazal after 1857 Urdu ghazal under progressivemovement Modern Urdu ghazal	✓	✓	✓	✓	
	3,Famous Urdu ghazal,poets,their poetry and its special features.	✓	✓	✓	✓	
2019 **Hons Paper** **SEM-2** **CC-3**	1. Urdu eligies and famous elegy poets 2. Urdu Qasida and famous Qasida poets 3. Ilm-e-Bayan(Literary device sand its types) Taqti	✓	✓	✓	✓	

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
2019 Hons Paper		**A**	**B**	**C**	**D**	**E**

SEM-3 CC-4	1.Urdu Masnawi , difination,style,terms Kinds and its values, from beginning to end . A critical view on Masnawi Zaher-e-Ishq.	✓	✓	✓	✓	
Hons Paper SEM-3 CC-5	2.Urdu Poem: Difination ,style,terms,topics and its values Famous poets and their poems Nazir Akbarabadi,Hali, ,Iqbal,Faiz,Meeraji, N.M.Rashid,Akhter ul Iman,,Parvez Shahidi,Nida Fazili Urdu Rubayat: Difination,style,terms, Topics and its history Rubayi poets as Mir Anis,Amjad Haiderabadi,Josh Malihabadi and Fraq Gaurakhpuri	✓	✓	✓	✓	
Hons Paper SEM-3 CC-6	Urdu fiction writer 1. Dastan Bagh o Bahar ,Fasana Ajayeb 2.Famous Urdu Novel and Novelist	√	√	√	√	
	.1. short stories and famous story writers	√	√	√	√	

	2..Urdu Drama Famous Urdu drama,dramatist and their contribution in Urdu literature	√	√	√	√	
Hons Paper **SEM-3** **CC-7**	Urdu Prose 1,The arts and trends of letter writing in Urdu literature Letters of famous writers Ghalib ke khutoot Gubar-e-Khatir,Maulana Abul Kalam Azad Aaj kal laila-e-sukhan ghair hazir hai : Faiz Ahmed Faiz	✓	✓	✓	✓	
	.2. Biography : Yadgar-e-Ghalib,Hali 3.sketh writing Md.Ayyub Ansari, Rashid Ahmed Siddiqi	✓	✓	✓	✓	

2019 Hons Paper SEC-A-1	**Baqui zaraye Iblagh** 1.Radio 2.Telivision 3.Asre hazir mein zaraye	✓	✓	✓	✓	

	iblagh ki ahmiat					
2019 Hons Paper SEC-A-2	**Urdu adab aur Hindustani Film** **1.**Hindustani film ka agaz o irteqa 2.Matni Tadrees a) Sahir Ludhyanwi b) Kaifi Azmi c)Shaharyar d) Mantoo e)Mirza Hadi Ruswa	✓	✓	✓	✓	
2020 Hons Paper SEM-4 CC-8	1.Inshayya : Barf ki almari 2.Article writing The meaning of article,the history and tradition of articles and its famous writers Sir Sayed Ahmed Khan : Taassub 3.Sahafat: Maulana Abul Kalam Azad Maulana Abdur Razzaque Malih Aabadi	✓	✓	✓	✓	
SEM-4 CC-9	Nai,Taraqqi pasand aur jaded ghaza : 1.1857 kay bad ghazal kay mizaj me tabdili 2.Siyasi ,samajiaur inqelabi pas manzar 3.Jadidyat ka rujhan aur ghazal 4. 1980 kay bad ghazalia shairi ka manzar nama. 5.Ghazaliyat baraye tadrees	✓	✓	✓	✓	
SEM-4 CC-10	Traqqi pasand aur jaded Nazm: 1.Taraqqi pasand Nazm a) IDHAR NA DEKHO:Faiz b) Ek Ladka:Akhtarul Iman c) Be cheragi: Parvez Shahidi 2. Halqa arbab e zauq aur Urdu Nazm a) Kalark ka Naghma e mohabbat: Miraji b) Andha Kabadi: Noon Mim Rashid	✓	✓	✓	✓	
SEM-4 SEC-B-1	Urdu Sahafat	✓	✓	✓	✓	
SEM-4 SEC-B-2	Urdu mein Awami Zaraye Iblagh	✓	✓	✓	✓	
2020 Hons Paper	Adabi Tahrikat: 1.Aligarh tahrik 2.	✓	✓	✓	✓	

SEM-5 CC-11	Roomani Tahrik 3. Taraqqi pasand Tahrik 4. Halqa e arbab e zauq 5. Jadidyat ka mafhoom 6. Tahrik e Niswan					
Hons Paper SEM-5 CC-12	Famous Urdu critics,some aspects of criticism What is criticism,its meaning,literary criticism,the value of literary criticism Different school of Criticism. Special study of tasurati tanqid,jamaliyati tanqid and marxi tanqid and study of Hali,Shibli,Aal Ahmed Suroor,Majnu Gaurakhpuri Ahtesham Hussain,Kalimuddin Ahmed and Shams ur Rahman Farooqi	✓	✓	✓	✓	
2020 SEM-5 DSE-A-1	Meer: 1. Meer-Sawanah aur ahad 2. Meer ki ghazal goi 3. Meer ki shairi Masnawi,Marsia aur Rubayee kay hawalay se 4. Meer ki Tazkarah nigari :Nakatush shora	✓	✓	✓	✓	
2020 SEM-5 DSE-B-1	Sir Sayed aur un ka Ahad: 1. Sir Sayed: Shakhsiyat aur Ahad 2. Sir Syed aur Aligarh Tahrik 3. Sir Syed kay rafaqa aur maasreen 4. Arbab ilm o aagahi aur sahafat me Sir Syed ka hissa	✓	✓	✓	✓	
2021 SEM-6 CC-13	Ghalib Life history of Ghalib,his date and place of birth,his period, The political and social condition of his period,The, journey of Calcutta. The poetic art of Ghalib,his different	✓	✓	✓	✓	

	publication both prose and poetry.The students of Ghalib To read 5 ghazals of Ghalib and its meaning					
Hons Paper SEM-6 CC-14	Group –B : The Urdu literature in West Bengal The beginning and development of Urdu literature in West Bengal,before and after freedom, Different trends of Urdu literature such as,translation,poetry,fiction Criticism and drama. The aegis of Fort William College in the developmentof Urdu prose. The influence of progressive movements The Urdu literature of Bengal after 1960.	✓	✓	✓	✓	
Hons Paper SEM-6 DSE-B-3	Mohd Hussain Azad	✓	✓	✓	✓	
DSE-B-4	Nazir Akbar Aabadi	✓	✓	✓	✓	

Department of Persian

Model Reference: University of Calcutta, CBCS Syllabus for Persian (Hons)

(With effect from 2018-19)

Programme Outcome Nos	Programme Outcome (PO)
PO A	• To acquaint learners with basic and advanced level knowledge of Persian as language of literatures, of philosophy of Literatures in Persian, of Persian as basis for Skill Enhancement
PO B	• Grammar is also essential for understanding Persian as a language as well as for learning a new language, since all languages follow grammatical patterns • Translation is necessary for the spreading new information, knowledge, and ideas across the world. It is absolutely necessary to achieve effective communication between different cultures. It is the only medium by which learners can know different works that will expand their knowledge of the world. • To acquaint with text to develop language skills as speaking, writing, and reading Reference : CC-1,2,3,4,5; SEC-A(1) &SEC-B(2)
PO C	• To acquaint abilities like critical reasoning, appreciation of texts, value education and all those qualities that contribute to the substantial development of learners • To acquaint learners with cultural and ethical context of Persian Literature • To develope with the aims to equip the students with the linguistic, language and literary skills for meeting the growing demand of this discipline and promoting skill based education Reference : CC-2,3,4,8,9,11,12
PO D	• To acquaint learners with usage of as medium of comprehension and imaginative/speculative exposition. The expectation and aim of the learning process is focused on Skill-Enhancement. • Reference : SEC A(1); SEC B(2)
PO E	• Introducing learners to basic and advanced level writing of other cultures using Persian and English Language as medium of translation • ..Acquaintance with a) Indo-Iranian Culture b) Classical Literature c) Modern Literature • Proficiency in Persian Language opens gate for career in sectors like tourism, diplomatic services, embassies, public relations, entertainment & international organisations, mass communication. Reference : DSE – A(2) ; DSE –B(2)

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	• To be able to understand the importance of language as the fundamental basis of the art and skill of communication. • To realize that language is evidence of the dynamic thought process of the human mind and indispensable to the birth, progress and evolution of human civilization. • To be able to relate culture to language and prepare the mind to absorb the necessity of linguistics and culture theories in advanced level education in future.
PSO 2	• To explore and understand generic categorization of communication. • Such exploration trains the mind in keen observing of human response to the living experience and distinguishes between various levels of sensitivity and intelligence. • The learner's mind becomes equipped to make the correct choice of genre for communicating his thought and this ensures clarity of expression.
PSO 3	• Hands-on training in functional use of the language empowers the learner to make language pliant and significant so that it adapts to the specific context. • Interpretation, publishing &translations technical translators, online content writers or decoders. • Training in Rhetoric & Prosody tunes the learner's listening ability to alterations in infections in human voice and prepares the learner to become sensitive to democratic understanding. This is one of the most valuable outputs of the course to prepare the learner to live a meaningful life in polyglot society.
PSO 4	• To be able to learn the character and aspiration of other subaltern cultures and see their progression towards becoming dominant cultures. The learner lives through the experience of epic human journeys and this broadens both knowledge and mind to make for holistic vision.

Mapping of PO & PSO for Persian Hons Syllabus of 2018-19 of CU

PSO	PO				
	A	**B**	**C**	**D**	**E**
1	√	√		√	√
2	√	√	√	√	√
3	√	√	√	√	√
4	√	√	√	√	√

Programme Outcome for CBCS Semester wise Courses in Persian Honours 2018-19

Under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
	CC -1	**A**	**B**	**C**	**D**	**E**
FIRST YEAR SEMESTER I (6 Months)	History of Persian Literature • Pre-Islamic Period (525BCE to 651 A.D. • Post-Islamic Period – 652 to 1186A.D. • Grammar • Translation	√	√	√	√	
	CC-2 • Modern Prose	√	√	√	√	√
SEMESTER II (6 Months)	CC 3 • History of Persian Literature(Classical) • Prose & Poetry • Grammar • Translation	√	√	√	√	√
	CC-4 • Poetry Modern	√	√	√	√	√
	Group B - Grammar(verbs) & Composition(kinds of sentence)	√	√	√	√	

TABLE II (i)

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
SECOND YEAR SEMESTER III (6 Months)		**A**	**B**	**C**	**D**	**E**
	CC –5 • History of Poetry (from beginning to Safavid dynasty)	√	√	√	√	
	CC-6 (History of Persian Literature in India during Delhi Sultans) • Prose • Grammar & Translation	√	√	√	√	√
	CC-7 (History of Persian Literature in India during Mughal Period) • Prose • Poetry	√	√	√	√	√
	SEC-A(1) • Translation & Composition	√	√	√	√	√

TABLE II (ii)

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
SECOND YEAR SEMESTER IV (6 Months)	CC-8 • Modern Poetry	√	√	√	√	
	CC-9 • Modern Prose					
	CC-10 • Development of Modern Persian Literature • Grammar & Composition					
	SEC-B(2) • Translation & Interpretation (from English into Persian &Vice versa from Newspapers) • Communicative Skill	√	√	√	√	√

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
Third Year Semester V (6 Months)	CC -11 (Mystical Persian Literature) • Prose • Poetry	√	√	√	√	√
	CC-12 (Ethical Persian Literature) • Prose • Poetry	√	√	√	√	√
	DSE-A(1) • Rhetoric • Prosody	√	√	√	√	√
	DSE-B(1) • Root Words, • Parsing • Analysis	√	√	√	√	√
Semester VI (6 Months)	CC-13 (Persian literature in Bengal) • Prose	√	√		√	√
	CC-14 (Persian Literature in Bengal) • Poetry					

	DSE-A(2) History of Modern Persian World: • Iran • Afghanistan • Tajikistan • Uzbekistan					
	DSE-B(2) • Persian Linguistic:					

DEPARTMENT OF PHILOSOPHY

Model Reference: University of Calcutta, Syllabus for Philosophy

(Honours) C.B.C.S. (with effect from 2018)

Programme Outcome No.s	**Programme Outcome (PO)**
PO A	• To improve the logical thinking and critical skills of the students.To enhance the ability to think logically and analyse as well as solve problems in a rightful way of thought. • It helps assessdifferent proposed solutions considering probability and certainty in respective areas. To broaden the perspective of mental, moral,social and religious life and thus benefit students,spiritually, intellectually and morally CCH and CC9
PO B	• To introduce young minds to a few systems of Indian Philosophy to enhance their ability to think better and be more sensitive and tolerant to the thoughts of other people and systems. • The skill to argueand debate is the need of the human of all times and philosophy provides the necessary tools for that. • It compasses the whole field of life.Indian Philosophy refers to ancient philosophical traditions of the Indian subcontinent.The principal schools are introduced with a classification of orthodox and heterodox schools. CC1
PO C	• To acquaint learners with Psychology as the science of behavior and mind by trying to explore behavior and mental processes such as perception,cognition, attention,intelligence,personality and more such traits. CC5
PO D	• To enhance the knowledge of the learners

	regarding the philosophy of the society and politics. • This aims to acquaint the learner with the varied societal forms and structures as well as with the different political ideals,justice,liberty and equality. CC6
PO E	• To acquaint learners with the rich variety of ancient,medieval,modern and contemporary western thought and its profundity looking on history of Western Philosophy. CC2
PO F	• To assimilate the diversity of information with which students are confronted both in the study of various disciplines and in their practical work. • To develop the basis for reflection,analysis and formulation of the laws and forms of right way of thinking. CC10
PO G	• To acquaint students with different questions of life based on one's own experience and the experience of others and help them in a critical and systematic way to engage in moral philosophy. • Students are encouraged to study three different types of questions within Ethics: normative, meta-ethics and practical ethics i.e.directly related with empirical matters. CC12
PO H	• To acquaint learners with philosophical study of meaning and nature of religion including analysis of religious concepts, beliefs, terms, arguments and practices of religious adherents. • Different arguments for as well as against the existence of GOD are introduced and

	critically discussed.\ CC7

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To be able to look at things with logical insight anddevelop impartial, wider, humane understanding of a situation which in the long run benefits a society. • To be aware of origins of ideas and concepts of our rich philosophical heritage. • To develop tolerance to other's views and assess /judge any theory with an open mind.
PSO 2	• Tobe able to have a scientific knowledge base in Psychology. • To generate awareness about scientific inquiry and critical thinking. • To enable learners to understand and engage in behavior patterns which are sound ethically and socially.
PSO 3	• To enhance the attitude awareness of learners as social beings • To encourage critical thinking regarding different socio-political movements. • To develop strong notionof freedom, duty and rights.
PSO 4	• To acquaint all of the major areas of philosophy as well as other relevant fields ,including theology,sociology,psychology history and the natural sciences. • To focus on religious language and belief,religious diversity, concepts of God/ Absolute Reality,arguments for and against the existence of God and problems of evil and sufferings and miracle.

Programme	**Programme Specific Outcomes (PSO)**

Specific Outcomes Nos	
PSO 1	● To be able to look at things and develop impartial, wider, humane understanding of a situation which eventually be beneficial to a society. ● To be aware of origin of ideas and concepts of our rich philosophical heritage. ● To develop tolerance to others' views and assess any theory with an open mind. ● To acquire knowledge of core concepts, distinctions, theories, argumentative techniques, movements within the core fields of epistemology, logic, metaphysics, ethics, religion and social & political philosophy.
PSO 2	● To be able to have a scientific knowledge base in Psychology. ● To inculcate the habit of critical thinking and general awareness of scientific inquiry. ● To enable learners to understand and engage in behavior patterns which are ethically and socially sustainable. ● To encourage students to read and interpret philosophical texts to explore knowledge about ancient, medieval and contemporary philosophical thoughts.
PSO3	● To enhance the attitude of awareness of learners as social beings ● To encourage critical thinking regarding different socio-political movements ● To develop strong notion of freedom, duty and rights. ● To enable the students to understand the concepts of moral principles and their application in everyday life. .
PSO 4	● To acquaint the learners with all the major areas of Philosophy as well as other relevant fields including Theology, Sociology, Psychology, History and the natural sciences. ● To focus on the difference between the study of religion and the study of Philosophy. ● To enable the learners to engage critically in analytic philosophy or philosophy

	of language. ● To focus on religious language and belief, religious diversity, concepts of God/ Absolute Reality, arguments for and against the existence of God and problems of evil and sufferings and miracles critically.
PSO 5	● To prepare the learner with overall and specific capabilities for diverse vocations.

Mapping of PO & PSO for Philosophy Hons Syllabus of 2018 of the University Of Calcutta

PSO	**PO**				
	A	**B**	**C**	**D**	**E**
1	√	√	√	√	√
2	√	√	√	√	√
3	√	√	√	√	√
4	√	√	√	√	√

Programme Outcome for Partial Semester wise Courses in PHILOSOPHY HONS. 2018 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
SEMESTER 1 CC 1 & 2		**A**	**B**	**C**	**D**	**E**
CC1 –Indian Pilosophy-1	CC-1 Introduction, Nastika & Astika Schools(NYaya-Vaisesika Schools)	√	√	√	√	√
CC2- History of Western	**CC 2** a)PreSocratic Philosophy	√	√	√	√	√
	b)Plato, Aristotle	√	√	√	√	√

philosophy-1	c) St. Thomas Acquinas d) Descartes e) Spinoza f) Leibnitz	√	√	√	√	√

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester II	**CC III**	**A**	**B**	**C**	**D**	**E**
CC III: Outlines of **Indian Philosophy II**	Samkhya_Yoga	√	√	√	√	√
	Mimamsa	√		√		√
	Advaita Vedanta and Visistadvaita Vedanta	√	√	√		√
	CCIV					
	Locke	√	√	√		√
	Berkley,Hume	√	√	√		√
CC IV: History of Western Philosophy II	Kant	√	√	√		√

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester III	**CC V**	**A**	**B**	**C**	**D**	**E**
CC V: Philosophy of Mind						
	Psychology Definition ,nature and Scope	√	√	√	√	√
	Methods of Psychology	√	√	√	√	√
	Sensation, Perception, Learning	√	√	√	√	√
	Different theories of learning, Philosophical theories of Mind, Consciousness, Intelligence ,Personality	√	√	√	√	√

CC VI: Social and Political Philosophy	**CC VI**					
	Natur&, Scope of:: Social philosophy Political Philosophy Relation between Social and Political Philosophy, Primary Concepts:Society,Community,ASSociation' Institution, Family: Nature, different forms of family Role of family in the society Social class and caste Theories regarding the relation bertween indiividual and society INDIVIDUALISTIC THEORY IDEALISTIC THEORY SECULARISM SOCIAL CHANGE :GANDHI ON SOCIAL CHANGE Political Ideals	√	√	√	√	√
	CC VII					
CC VII **Philosophy of Religion**	NATURE and SCOPE of Philosophy of Religion Doctrine of Karma, Rebirth and liberartion	√	√	√	√	√
	The Philosophical teachings of the Holy Quran:God the ultimate reality.HIS atributes, his relation to the world and man Some basic tenets of Christianity The doctrine of Trinity, The theory of redemtion **Religious PlURALISM, ARGUMENTS FOR THE EXISTENCE OF GOD.**	√	√	√	√	√

TABLE IV

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester IV	**CC VIII**	**A**	**B**	**C**	**D**	**E**
Wesetern Logic1 CC VIII	Logic,Argument,Deductive and Inductive Arguments	√	√	√		√
	Statements,Truth & validity, Propositions, its classes	√	√	√		√
	Inductcve arguments, Mill's methosScience and Hypothesis	√	√	√		√

CC IX Western LogicII **CC X : WESTERNE PISTEMOL OGY AND METAPHYS ICS**	Probability: Alternative concepts The probability Calculus.	√	√	√		√
	CC IX					
	Symbolic logic	√	√	√		√
	Formal proof of Validity	√	√	√		√
	Quantification	√	√	√		√
	CC X					
	Concepts Truth	√	√	√		√
	Sources of knowledge Some Principal uses of the verb"To Know" CONDITIONS OF PROPOSITIONAL KNOWLEDGE' STRONG AND WEAK SENSE OF KNOW. Analytic Truth and Logical possibility The apriori The problem of INDUCTION CAause and Causal Principles Realism,Idealism,Phenomenalism,	√	√	√		√
		√	√	√		√

TABLE V

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester V **CC XI**	**CC XI**	**A**	**B**	**C**	**D**	**E**
	Nyaya Logic & Epistemology buddhi or jnana & it's four types	√	√	√		√
	PRATYAKSA &SANNIKARSA	√	√	√		√
	CC XII					
Ethics (IndianSEM-6CC 13	**Introduction,, Meaning of Dharma, vidhi nisedha'** **Buddhist ethics and Jaina ethics.**	√	√	√		√

CC-XIII NYAYA LOGIC & EPISTEMOLOGY	**CC-XIII NYAYA LOGIC & EPISTEMOLOGY**					
CC XIV WESTERN ETHICS	ANUMANA	√	√	√		
	UPAMANA, SABDA PRAMANA	√	√	√		√
	LOGICAL REASONING AND APPLICATION INDIAN & WESTERN	√	√	√		√
SEC A - EMERGING TRENDS OF THOUGHT						
SEC- B BUSINESS ETHICS	**BUSINESS ETHICS**	√	√	√		√
SEC-C FEMINISM	**FEMINIST PHILOSOPHY**					
SEC-D PEACE STUDIES	**PEACE STUDIES**					
SEC E- RECENT TRENDS IN ETHICS	**DSE-G 1**					
	CONCEPT OF Sat,Dravya,Paryaya,Syadvada Samkhya,yoga, mimamsa selected topics		√	√		√
DSE-G1– INDIAN PHILOSOPHY	**A. Swami vivekananda: nature of man . Nature of Religion B. Ideal of Universal Religion,Practical Vedanta C. C.Gandhi: Nature of man, Non-violence, Satyagraha,theory of trusteeship D. Ambedkar:Critique of Social evils, Dalit Movement.**	√	√	√	√	√
DSE-G2 Contemporary indian thought:						
	Original Development of FeministThought	√	√	√		
	Philosophical basis of Feminism		√	√	√	√
DSE- G 3	**Different Branches of Feminism& important issues**		√	√	√	√

FEMINISM						
	BIOETHICS	√	√	√		
	INTRODUCTION AND UNDERSTANDING ETHICS AND BIOETHICS	√	√	√		
DSE G4 Emerging Trends of THOUGHT	HUMAN DIGNITY AND HUMAN RIGHTS.	√	√	√		
	PRINCIPLES OF BENEFITS AND HARM AUTONOMY,CONSENT AND PRIVACYAUTONOMY &INDIVIDUAL RESPONSIBILITY, HEALTH AND RESPONSIBILITY	√	√	√		

Department of HINDI

Model Reference: University of Calcutta, Syllabus for HINDI (Hons – CBCS)

(with effect from 2018-19)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• To acquaint learners with advanced level knowledge of Hindiin the Aadikal of (ancient period) the history of Hindi literature and also making them aware of the padas and dohas written mainly in Braj and Awadhi , the two important dialects of the period. Reference Paper – 1& 2 • To let the learners know about the Nabjagaran in the Hindi belt as well as in the Hindi literature. To acquaint them with the begining of the modern age in the Hindi literature. (Semester – 1)
PO B	• To acquaint the learners with the potentialities of the Mediaval poets of the Hindi literature. Reference Paper - 3 • To introduce the Modern Hindi poetry to the learners upto the Chhayawad yug. Reference Paper – 4 (Semester – 2)
PO C	• To acquaint the students with the Modern Hindi poetry including Nayi – Kavita (after Chhayawad yug) . Reference Paper – 5 • To introduce Bharatiya Kabyashastra to the learners , making them aware of the Rasas, Dwani and Alankar Siddhant . Reference Paper – 6 • To acquaint the learners with the Philosophy of T.S.Iliot , Wordsworth , Aristrotle , Pleto etc under Paschatya Kabyashastra . Reference Paper – 7 (Semester – 3)
PO D	• To acquaint the learners with the details of Hindi linguistics various dialects of Khariboli Hindi , Rashtra Bhasha , Rahbhasha and Sampark

	Bhasha Hindi and official language Hindi . Reference Paper – 8 • To introduce Hindi Novels starting from Munshi Premchand . Reference Paper – 9 • To acquaint the learners with Hindi Stories . Reference Paper – 10 (Semester – 4)
PO E	• To acquaint the learners with Hindi Drama and Ekanki . Reference Paper - 11. • To let the learners know about Hindi Nibandh and other forms of Hindi Prose . Reference Paper – 12 (Semester – 5)
PO F	• To let the students know about the Hindi Patrakarita . Reference Paper -13 • To acquaint the learners with the details of Prayojanmulak Hindi . Reference Paper – 14 (Semester – 6)

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To able to understand the importance of language as the fundamental basis of the art and skill of communication. • To enablethe students to understand the importance of the Mediavel poets ,procure detail knowledge of the language so as to create an atmosphere of correlation with the linguistic pattern and culture of the period.To able to understand the modern prose forms and inculcate a view of comparison between the style and pattern of prose forms.
PSO 2	• To explore and understand generic categorization of communication. • Such exploration trains the mind in keen observing of human response to the living experience and distinguishes between various levels of sensitivity and intelligence. To enable the students to understand the origin and the entire journey of Hindi literature,so as to acquire an allround concept of various eras.To motivate the students towards the modern poetry and inculcate the seeds of literature and language in true sence.
PSO 3	• Hands-on training in functional use of the language empowers the learner to make language pliant and significant so that it adapts to the specific context. • To able to develop a conteptual outlook towards different literatures.To have a clear picture of official language Hindi.

PSO 4	• To be able to learn the character and aspiration of other subaltern cultures and see their progression towards becoming dominant cultures.To develop a clear outlook regarding the media.

Mapping of PO & PSO forHindi Hons(CBCS) Syllabus of 2018-19 of CU.

PSO	**PO**					
	A	**B**	**C**	**D**	**E**	**F**
1	✓	✓		✓		✓
2	✓	✓	✓	✓	✓	
3	✓		✓	✓		✓
4	✓			✓	✓	✓

Programme Outcome for Semester wise Courses in Hindi Honours(CBCS) 2018-19 under University of Calcutta

TABLE I

COURSE DURATION (Each Semester of Six Months)	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**					
		A	**B**	**C**	**D**	**E**	**F**
Semester – 1 Paper 1 & 2	HIN-A-CC-1-1 Hindi Sahitya ka Itihas(upto Ritikaal) CC-1-2 Adhunik kaal	✓		✓			
Semester – 2 Paper 3 & 4	CC-2-3 Aadikaleen aur Madhyakaleen Kavita. CC-2-4 Aadhunik Hindi Kavita.	✓	✓			✓	

Semester – 3 Paper 5 , 6 & 7	CC-3-5 Chhayawadottar Hindi Kavita . CC-3-6 Bharatiya Kabyashastra . CC-3-7 Paschtya Kabyashastra .	✓	✓	✓			

TABLE II

COURSE DURATION (Each Semester of Six Months)	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**					
		A	**B**	**C**	**D**	**E**	**F**
Semester – 4 Paper 8 , 9 & 10	CC-4-8 Bhasha Vigyan aur Hindi bhasha . CC-4-9 Hindi Upanyas . CC-4-10 Hindi Kahani .	✓			✓	✓	✓
Semester – 5 Paper 11 & 12	CC-5-11 Hindi Natak aur Ekanki. CC-5-12 Hindi Nibandh aur anya gadya niband	✓	✓			✓	
Semester – 6 Paper 13 & 14	CC-6-13 Hindi ki Sahityik Patrakarita. CC-6-13 Prayojanmulak Hindi.	✓			✓		✓

Department of Sanskrit

Model Reference: University of Calcutta, Syllabus for Sanskrit (CBCS)

(with effect from 2018-19)

Programme Outcome Nos	**Programme Outcome (PO)**
PO A	• Offering learning opportunities to orient the students towards the scientific and humanistic study of the Sanskrit language.
PO B	• Creating a language environment for students to acquire the language skills assessed by their conversation and usage of the language.
PO C	• Help shaping cognitive, affective and behavioral abilities of students for building responsible academic professionals and researchers.
PO D	• Infusing the notion of Seva (service) in the students to be able to take part in social transformation.
PO E	• knowing the application of ancient Indian wisdom in contemporary problem solving situations. • Imparting knowledge of basic living and concepts from ancient literature which is timeless and still applicable to the society.

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To be able to understand the importance of language as the fundamental basis of the art and skill of communication. • Basic communication skills in understanding Sanskrit with LSRW (Listening, Speaking, Reading & Writing) capacities. • To be able to relate culture to language and prepare the mind to absorb the necessity of linguistics and culture theories in advanced level education in future.
PSO 2	• Skill adaptability in specific areas. • Usage of critical thinking while correlating concepts with personal experiences. • Usage of Shastric discipline and ancient traditional learning while discriminating others.

PSO 3	• Articulation of ideas, literary writing, innovations and effective presentation skills in Sanskrit as well as in other native Indian languages and English. • Building confidence to explore and study various Indian sciences. • Ability to explore ancient Indian sciences with confidence.
PSO 4	• Competency building to convey the society at large about Indic Knowledge and wisdom.

Mapping of PO & PSO for Sanskrit Hons (UNDER CBCS) Syllabus of 2018-19 of CU.

PSO	**PO**				
	A	**B**	**C**	**D**	**E**
1	√	√		√	
2	√		√	√	√
3	√	√		√	
4	√			√	√

Programme Outcome for Partial Semester wise Courses in Sanskrit Honours 2018-19 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
Semester- 1 (July to December) CC-1	Raghuvamsam	√	√	√	√	
	Kumarsambhabam	√	√	√	√	
	Kiratarjuniyam	√				
	Nitisatakam	√	√	√	√	
	Orugin and Development of Mahakavya&Gitikavya	√	√	√	√	
CC-2	Vedic Literature	√	√		√	
	Ramayana	√	√	√	√	
	Mahabharata	√	√	√	√	
	Puranas	√	√		√	

	General introduction to VyakaranaDarshanaSahitysastra	√	√	√	√	

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
Semester -2 CC-3 (January to June)	Sukhnasopadesh	√	√	√	√	
	Rajavahanacaritam	√	√	√	√	
	Origin and development of prose, Important prose romance and fables	√	√	√	√	
CC-4	Gita: Cognition & Emotive apparatus	√	√	√	√	
	Gita : Controlling the mind Confusion and Conflict	√	√	√	√	
	Gita: Self-management through Devotion	√	√	√	√	

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
		A	**B**	**C**	**D**	**E**
SemesterIII (July to December) CC-5	Svapnavasavadattam	√	√	√	√	
	Abhijnanasakuntalam.	√	√	√	√	
	Critical survey of Sanskrit Drama.	√	√	√	√	

CC-6	Introduction to Sanskrit Poetics	√	√	√	√	
	Forms of ofKavya Literature	√	√		√	
	SabdaSakti and Rasa-Sutra	√	√	√	√	
	Figures of speech and meter	√	√	√	√	
CC-7	Indian Social Institution : Nature and Concepts	√	√	√	√	
	Structure of Society and Values of Life	√	√	√	√	
	Indian Polity: Origin and Development	√	√	√	√	
	Cardinal Theories and Thinkers of Indian Polity	√	√	√	√	
SEC-A	1. Translation 2.Comprihention in Sanskrit 3. Paragraph Writing 4.Letter writing 5. Essay Writing	√	√	√	√	

TABLE IV

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester -4 CC-8 (January to June)		**A**	**B**	**C**	**D**	**E**
	Epigraphy	√	√	√	√	√
	Palaeography	√	√	√	√	√
	Study of selected inscription	√	√	√	√	√
	Chronology	√	√	√	√	√
CC-9	Mahakavya and Charitakavya	√	√		√	√

	Gadya and Rupaka 1.Sivarajavijayam 2.Atha-Kim 3.Daridradurdaivam 4.Rukminiharanam	√	√	√	√	
CC-10	Sanskrit studies in West	√	√	√	√	
	Sanskrit Studies in East	√	√	√	√	
	Sanskrit Fables in world Literature	√	√	√	√	
	Ramayana and Mahabharata in South Eastern Asia	√	√	√	√	
	Kalidasa in the West	√	√	√	√	
	Sanskrit Studies across the World	√	√	√	√	
SEC-B-2	1. Translation 2.Comprihention in Sanskrit 3. Paragraph Writing 4.Letter writing 5. Essay Writing	√	√	√	√	

TABLE V

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
	Rgveda	**A**	**B**	**C**	**D**	**E**
Semester -5 CC-11 (July to December)	Vedic Grammer	√	√	√	√	
	SuklaJajurvedaRudradhyaya	√	√	√	√	
	Brahamana and Upanisada	√	√	√	√	
DSE-1	Tarkabhassa	√	√	√	√	
	Saptapadarthi	√	√	√	√	
	Vivekacuramoni	√	√		√	
CC-12	General Grammer					
	General Introduction of Philology	√	√	√	√	
	Karakaprokaranam	√	√	√	√	

	Samasaprakaranam	√	√	√	√	
DSE-2	Sahityadarpana- Ch-1,2,3	√	√	√	√	

TABLE VI

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**				
Semester -6 CC-13 (January to June)	Essentials of Indian philosophy	**A**	**B**	**C**	**D**	**E**
	Ontology (Based on Tarkasamgraha)	√	√	√	√	
	Epistemology (Based on Tarkasamgraha)	√	√	√	√	
DSE-3	SIddhantakaumudi-SecA- Striprtyaya SecB-TinantaPrakarana SecC-Ajanta Pumlinga	√	√	√	√	
CC-14	Vibhaktyartha, Voice and Krt	√	√	√	√	
	Translation and comiunication	√	√		√	
	Essay	√	√	√	√	
DSE-4	Estarn and Western interpretation of the Veda	√	√	√	√	
	Sunahsepopakhuana of AitareyaBrahamana	√	√	√	√	
	TaittiriyopanisadSiksavalli	√	√	√	√	
	Mundakopanisad					

Department of Political Science

UNDERGRADUATE SECTION

CBCS - Political Science Honours Syllabus

Programme Outcome (PO) and Programme Specific Outcomes (PSO)

(With effect from 2018-19)

Programme Outcome Nos	Programme Outcome (PO)
PO A	• To acquaint learners with politics as a dynamic discipline and the radical changes that has occurred in its substance, theory and methods in recent decades. To be able to provide a 'launching pad' for learners seeking a clear grasp of the key methodological, theoretical and empirical issues, and the main areas of debate, in the complex and fragmented world of political science.
PO B	• To acquaint learners with the Indian Constitution and its political processes. • To acquaint learners with the structural questions of how the systems of institutions of the modern Indian state was formed, and how these institutions actually functioned over the last seventy three odd years since independence. Reference Paper 2
PO C	• To acquaint learners with the constitutional processes of different countries of the world with special emphasis on the constitutions of UK, USA and China; along with a minor coverage of the constitutions of countries like Switzerland and Bangladesh. Reference Paper 4
PO D	• To acquaint learners with the various conflicting and competing strands of Indian political thinkers right from ancient times to the present. • To acquaint learners, to a broader extent, with the Indian national freedom struggle launched by the Indian National Congress along with the ideas of the leading stalwarts of the times like Savarkar, Jinnah, Ambedkar, Subhas Bose, Phule etc. Reference Paper 3
PO E	• To acquaint learners with the study of International Relations both as a theoretical discipline as well as with the intricacies of global politics as it plays out all over the world today. • Acquaintance of learners also with India's International Relations and her

	Foreign Policies. Reference Paper 5
PO F	• To acquaint learners with the interdisciplinary nature of the subject matter of Political Science – its interaction with Sociology (a key sister discipline). • To attempt to equip learners with some of the following sub themes and issues related to the allied subject of Sociology that overlap with Political Science – like Political Culture, Socialisation, Caste, Class, Elites, Gender, Religion, Society etc. Reference Paper 6
PO G	• To acquaint learners with the proliferation of political thought in the Western world – beginning from ancient Greece and Rome (the lands of origin of classical western political thought) through medieval political thinkers whose innumerable contributions have set the stage for modern Western political thinkers of our times. • This will acquaint learners with the various 'isms' and ideologies like liberalism, justice, democracy etc. Reference Paper 7
PO H	• To acquaint learners with the 'actual' and 'practical' workings of government – How 'government in action' attempts to tackle the raging administrative crises in regimes all over the world. • Learners, through this programme, also get a detailed overview of the workings of the Indian State and its administrative apparatus as it grapples with plaguing problems like poverty, disease, unemployment and corruption. Reference Paper 8

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	• To be able to understand the 'actual' and 'practical' workings of politics and the way states, structures, systems, institutions and organizations around the world deal with the issues confronting them. • Such a study will help to understand that political thought, theory, thinking and ideologies in different countries take shape, and are to a great deal, influenced by the countries and regimes to which they belong.
PSO 2	• To explore the historical backgrounds and origins of contemporary thinkers and discourses. • Such historical exploration helps set the precedent for further understanding of the present.

PSO 3	• To learn the nature and ever-changing dynamics of the current world in which we live. • Such training will help learners understand the 'raison d'etre' of the policies, actions and manipulations of policy makers, leaders and decision makers in today's world.
PSO 4	• To be able to comprehend the inter-linkages between various social science disciplines and the way they come together to throw a better and more focused light on the problems man encounters in his day to day life.

Mapping of PO & PSO for Political Science Hons Syllabus of 2018-19 of CU.

PSO	**PO**							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1	√	√	√	√	√	√	√	√
2		√	√		√		√	
3	√	√		√	√	√		√
4				√	√	√		√

Programme Outcome for Partial Semester wise Courses in Political Science Honours 2018-19 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**							
Semester I-6 Months		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
	Understanding Political Theory: ConceptsCode: PLS-A-CC-1-1-TH+TU **Module I**: 1.Conceptualising politics: meaning of *political*. 2.Key concepts I: State; Nation; Sovereignty (evolution); Power and Authority--- types and linkages; 3.Key concepts II: Law. Liberty, Equality---- interrelationships.	√							

	Module II: 4. Key concepts III: Rights; Justice (with special reference to Rawls); Freedom. 5. Key concepts IV: Democracy (with special reference to David Held); Authoritarianism. 6. Key concepts V: Citizenship. **Understanding Political Theory: ApproachesandDebatesCode: PLS-A-CC-1-2-TH+TU** **Module I:** 1.Approaches I: Normative; Legal-Institutional; Empirical-Behavioual---Systems Analysis; Structural Functionalism. 2. Approaches II: Liberalism; Social Welfarism; Neo-Liberalism. 3. Approaches III: Postcolonial; Feminist. **Module II:** 4.Marxian approach--- Dialectical Materialism and Historical Materialism. 5. Key ideas: State (focus on Relative Autonomy); Class and Class Struggle; Surplus Value; Alienation. 6. Party--- Democratic Centralism; Lenin-Rosa Luxemburg debate; Revolution---Lenin and Mao. Hegemony and Civil Society: Gramsci.	√ √ √							
Semester II 6 Months	**Semester II** **Constitutional Government in India Code: PLS-A-CC-2-3-TH+TU**								

	Module I: 1.Evolution of the Indian Constitution. Role of the Constituent Assembly--- debates (overview). The Preamble. 2.Citizenship. Fundamental Rights and Duties. Directive Principles. 3.Nature of Indian Federalism: Union-State Relations. 4.Union Executive: President, Vice-President: election, position, functions (focus on Emergency Powers), Prime Minister, Council of Ministers, relationship of Prime Minister and President. **Module II:** 5.Union Legislature: Rajya Sabha, Lok Sabha: Organisation, Functions – Lawmaking procedure, Parliamentary procedure, Privileges, Committee system. Speaker. 6.Government in states: Governor, Chief Minister and Council of Ministers: position and functions – State Legislature: composition and functions. 7.Judiciary: Supreme Court and the High Courts: composition and functions – Judicial activism. 8.Constitutional amendment. Major recommendations of National Commission to Review the Working of the Constitution. **Politics in India:Structures and ProcessesCode: PLS-A-CC-2-4-TH+TU** **Module I:** 1.Party system: features and trends – major national political parties in India: ideologies and programmes. Coalition politics in India: nature and trends. Political parties in West Bengal:		√ √ √						

	Overview. 2.Electoral process: Election Commission: composition, functions, role. Electoral reforms. 3. Role of business groups, working class, peasants in Indian politics. **Module IV:** 4.Role of (a) religion (b) language (c) caste (d) tribe. 5. Regionalism in Indian politics. 6. New Social Movements since the 1970s: (a) environmental movements (b) women's movements (c) human rights movements.		√						
SEM III **6 Months**	**Semester III** **Indian Political Thought– I Code: PLS-A-CC-3-5-TH+TU** **Module I:** 1 Ancient Indian Political ideas: overview. 2. Kautilya: Saptanga theory, Dandaniti, Diplomacy. 3. Medieval political thought in India: overview (with reference to Barani and AbulFazal). Legitimacy of kingship. 4. Principle of Syncretism. **Module II:** 5. Modern Indian thought: Rammohun Roy as pioneer of Indian liberalism – his views on rule of law, freedom of thought and social justice. 6. Bankim Chandra Chattopadhyay, Vivekananda and Rabindranath Tagore: views on nationalism.				√ √				

	7. M.K. Gandhi: views on State, Swaraj, Satyagraha. **Comparative Government and PoliticsCode: PLS-A-CC-3-6- TH+TU** **Module I:** 1. Evolution of Comparative Politics. Scope, purposes and methods of comparison. Distinction between Comparative Government and Comparative Politics. 2. Major approaches to the study of comparative politics---Institutional approach (dominant schools: Systems approach and Structural Functional approach)---limitations; New Institutionalism, Political Economy---origin and key features. 3. Development and democratization: S.P. Huntington. 4. Classification of political systems. Nature of liberal and socialist political systems; distinguishing features---conventions, rule of law (UK), separation of powers, checks and balances, judicial review (USA), democratic centralism (PRC), referendum, initiative (Switzerland). 5. Political Parties: Typology, features and roles (UK, USA, PRC and Bangladesh). Interest groups: roles (UK and USA). **Module II:** 6. Unitary system: UK, Bangladesh. Federal system: USA, Russia.			√					

	7. Legislature in UK, USA and PRC: composition and functions of legislative chambers; Committee System in UK and USA 8. Executive in UK, USA, France and Russia: A comparative study of (i) Russian, French and American Presidency; (ii) British and French cabinet systems. 9. Judiciary in UK, USA and PRC (with focus on the Procuratorate): comparative study. 10. Rights of the citizens of UK, USA and PRC: A comparative study. **Perspectives on International RelationsCode: PLS-A-CC-3-7-TH+TU** **Module I:** 1. Understanding International Relations: outline of its evolution as academic discipline. 2. Major theories: (a) Classical Realism and Neo-Realism (b) Dependency (c) World Systems theory. 3. Emergent issues: (a) Development (b) Environment (c) Terrorism (d) Migration. **Module II:** 4. Making of foreign policy. 5. Indian foreign policy: major phases: 1947-1962; 1962-1991; 1991-till date. 6. Sino-Indian relations; Indo-US relations.			√		√ √			

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	B	C	D	E	F	G	H
SEM-IV 6Months	**<u>Semester IV</u>** **Indian Political Thought II Code:** **PLSA-A-CC-4-8-TH+TU** **Module I:** 1. M.N. Roy: Radical Humanism. 2. Narendra Deva, Ram Manohar Lohia, Jayaprakash Narayan: Socialist ideas 3. Syed Ahmed Khan and Iqbal: views on colonialism and nationalism. **Module II:** 4. Nehru: views on Socialism and Democracy. Subhas Chandra Bose: views on Socialism and Fascism. 5. Contested notions of 'nation'--- Savarkar, Jinnah. 6. JyotibaPhule and Ambedkar on caste system and untouchability. PanditaRamabai's views on social justice **Global Politics since 1945Code: PLS-A-CC-4-9-TH+TU** **Module I:** 1. Cold War and its evolution: outline.Emergence of Third World: NAM; Pan Africanism. Post-Cold War world: overview. Globalization: conceptions and perspectives. 2. Europe in transition: European Union,				√				
					√				
						√			

	Brexit (overview). 3. Major institutions of global governance: World Bank, IMF, WTO--- overview. Major regional organizations: ASEAN, OPEC, SAFTA, SAARC and BRICS. West Asia and the Palestine question. **Module II:** 4.India and her neighbours I: Pakistan; Bangladesh. 5. India and her neighbours II: Nepal; Bhutan; Sri Lanka. 6. UNO: background; Major organs--- General Assembly, Security Council and Secretariat (with focus on Secretary General). Role of UNO in peace-keeping, human rights, and development (Millennium Development Goals and Sustainable Development Goals). **WESTERN POLITICAL THOUGHT AND THEORY I** Code: PLS-A-CC-4-10-TH+TU **Module I:** 1. Greek political thought: main features – Plato: justice, communism – Aristotle: state, classifications of constitutions. 2. Roman political thought: theories of Law and Citizenship – contributions of Roman thought. 3. Medieval political thought in Europe: major features. 4. Contribution of Machiavelli. Significance of Renaissance. Political thought of Reformation. **Module II:** 5. Bodin: Idea of Sovereignty. 6. Hobbes: founder of science of materialist politics. 7. Locke: founder of Liberalism. views on natural rights, property and consent. 8. Rousseau: views on freedom and					√		√ √	

	democracy.								
SEM V 6Months	**WESTERN POLITICAL THOUGHT AND THEORY II Code: PLS-A-CC-5-11-TH+TU** **Module I:** 1. Bentham: Utilitarianism. John Stuart Mill: views on liberty and representative government. 2. Hegel: Civil Society and State. 3. T. H. Green: Freedom, Obligation. **Module II:** 4. Utopian and Scientific Socialism: basic characteristics. 5. Varieties of non-Marxist socialism: Fabianism, Syndicalism, Guild Socialism. 6. Anarchism: overview. 7. Cultural Marxism: Frankfurt School (overview). Post-Marxism: emergence and basic contentions. **Political Sociology Code: PLS-A-CC-5-12-TH+TU** **Module I:** 1. Social bases of politics. Emergence of Political Sociology. 2. Political culture and Political socialization: nature, types and agencies. 3. Political participation: concept and types. 4. Political development and social change. 5. Political Communication: Concept and structures. **Module II:** 6. Social stratification and politics: caste,						√ √ √		

	tribe, class, elite. 7. Gender and politics: basic issues. 8. Religion and politics: varying perspectives. 9. Military and politics: conditions and modes of intervention. 10. Electorate and electoral behaviour (with special reference to the Indian context).						√		
SEM VI 6Months	**<u>Semester VI</u>** **Public Administration-- Concepts and PerspectivesCode: PLS-A-CC-6-13-TH+TU** **Module I:** 1. Nature, Scope and Evolution of Public Administration – Private and Public Administration. Principles of Socialist Management. 2. Challenges to discipline of Public Administration and responses: New Public Administration, Comparative Public Administration, Development Administration (Indian context). 3. Major concepts of administration: (a) Hierarchy (b) Unity of Command (c) Span of Control (d) Authority (e) Centralization, Decentralization and Delegation (f) Line and Staff. 4. Public Administration in the era of globalization, liberalization and privatization. Governance: conceptual emergence--- distinction with government. e-governance: features and significance. **Module II:** 5. Bureaucracy: views of Marx and Weber. 6. Ecological approach to Public Administration: Riggsian Model. 7. Administrative Processes: (a) Decision								√ √

	making (b) Communication and Control (c) Leadership (d) Coordination. 8. Public Policy: definition, characteristics. Models. Policy implementation. **Administration and Public Policy in IndiaCode: PLS-A-CC-6-14-TH+TU** **Module I** 1. Continuity and change in Indian administration: brief historical overview. 2. Civil Service in India (Bureaucracy): recruitment (role of UPSC, SPSC), training. 3. Organization of Union Government: Secretariat Administration: PMO, Cabinet Secretariat. 4. Organization of State Government: Chief Secretary – relations between Secretariat and Directorate. 5. District Administration: role of District Magistrate, SDO, BDO. **Module II:** 6.Local Self Government: Corporations, Municipalities and Panchayats in West Bengal, structure and functions. 73rd and 74th Amendment: overview. 7. Planning: Planning Commission, National Development Council. District Planning. Changing nature of planning: NITI Ayog. Budget--- concept and significance. 8. Financial Administration: Public Accounts Committee, Estimates Committee – role of CAG. 9. Citizen and administration: functions of Lokpal and Lokayukt. Right to Information--- Citizen Charter. 10. Citizen and social welfare policies: MGNREGA; SarvaShikshaAbhiyan (SSA); National Health Mission (NRHM).							√	√

Department of Sociology

Model Reference: University of Calcutta, Syllabus for Sociology (Honours) (CBCS)

PROGRAMME OUT COME (PO) : CBCS

PROGRAMME OUTCOME NOS	PROGRAMME OUTCOME (PO)
POA	• Introduce the learners to a sociological way of thinking. • To acquaint learners with the Indian society with its different institutions and practices, identity and challenges that India face today. Reference Paper: 1, 2
POB	• To acquaint learners with different sociological theories—classical and contemporary. • This will enrich learners with various social thought. The writings of different western philosophers and social thinkers from classical to modern era enlighten the present learners. • The learners also enrich themselves with the post classical thoughts. Reference Papers: 3, 11 , 13.
POC	• To acquaint learners with a variety of socio political approaches. • Learners are acquainted with a comparative understanding of political relationship among individual and society through the related topics like power ,government, state, and social relationship. Reference Papers: 4 , 5.
POD	• Introducing learners with religion as a sociological concept and establishing the recent trends in contemporary society with different dimensions. Reference Papers: 6.
POE	• Introducing the learners with economic sociology- its different processes and contemporary issues. Reference Paper: 8
POF	• To acquaint learners with the demography of India—its various approaches regarding population studies, population programmes and policies in India. Reference Paper: 9
POG	• Introducing the learners with the gender as social construct , gender identity and inequality. • To acquaint learners with sociological study of social inequality and its diverse forms. Reference Papers: 7 , 10.
POH	• To acquaint learners with the different concepts and research methods. • Introducing learners to the statistical application to conduct both qualitative and quantitative research. This will help the leaners to develop the skills to identify the problems and to conduct research by using statistical tools. Reference Papers: 12, 14.

PROGARMME SPECIFIC OUTCOME (PSO): CBCS

PSO NUMBER	PSO
PSO 1	• To be able to relate sociology with other social sciences and prepare for theorising new ideas in the inter-disciplinary fields. • To be able to understand the crucial problems and issues and relate them to the theoretical context.
PSO2	• To explore the historical background and origins of contemporary thinkers and discourses. • To be equipped with up- coming social situations and issues.
PSO3	• To be able to apply the knowledge in various of fields of sociology for higher studies and research. • To be able to develop research oriented skill through the involvement in various project works (field work) on different contemporary issues.
PSO4	• To be able to prepare for a successful career in their coming future. (through NGOs and others significant fields related to sociology studies.)

PSO	PO							
	A	B	C	D	E	F	G	H
1	✓	✓	✓					
2				✓		✓	✓	
3	✓							✓
4								✓

Programme Outcome for Partial Semester wise Courses in Sociology Honours 2018 under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
FIRST YEAR SEMESTER I (6 Months)	**CC-1 Introductory Sociology– I** **1. Sociology: Discipline and Perspective** 1.1 Thinking Sociologically 1.2 Emergence of Sociology 1.3Some Basic Concepts: 1.4Individual and Society; Socialization: Culture **2. Sociology and Other Social Sciences** **3. Human Society** 3.1 Social Institutions and Social Processes 3.2 Social control 3.3 Conformity and Deviance. 3.4 Social Change **CC-2 Sociology of India – I** **1. India: An Object of Knowledge**	√							

	1.1 The Colonial Discourse 1.2 The Nationalist Discourse 1.3 The Subaltern Critique **2. Indian Society: Concepts and Institutions** 2.1. Caste: 2.2. Agrarian Classes 2.3. Tribe: Profile and Location 2.4. Village: Structure and Change 2.5. Kinship: Principle and Pattern 2.6. Religion and Society								
FIRST YEAR SEMESTER II (6 Months)	**CC-3 Introductory Sociology – II** 1. On the Plurality of Sociological Perspective 2. Functionalism 3 Interpretive Sociology 4 Conflict Perspective 5 Structuralism 6 Feminist Perspective **CC-4 Sociology of India – II** 1. Ideas of India 1.1. Gandhi and Ambedkar 1.2. Indological and Ethnographic Approaches 2. Resistance, Mobilization, Change 2.1. Dalit Politics 2.2. Mobility and Change 2.3. Women's Movement 2.4. Peasant Movements 2.5. Ethnic Movements 2.6. Middle Class Phenomenon 3. Challenges to Civilization, State and Society 3.1. Communalism: 3.2. Secularism 3.3. Nationalism		√	√					

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**

SECOND YEAR SEMESTER III (6 Months)	**CC-5 Political Sociology** 1. Contextualising the study of Politics 2. Basic Concepts 2.1Power and Authority 2.2State, Governance and Citizenship, Citizenship, Rights, Obligations and Civil society 2.3Elites and the Ruling Classes 3. Political Systems 4. Everyday State and Local Structures of Power in India **CC-6 Sociology of Religion** 1. Religion as a Sociological Concept 2. Elements of Religious 3. Religion and Society **CC-7 Sociology of Gender and Sexuality** 1. Gendering Sociology: An overview 2. Gender as a Social Construct 3. Gender: Differences and Inequalities 4. Gender, Power and Resistance			√	√			√	
SECOND YEAR SEMESTER IV (6 Months)	**CC-8 Economic Sociology** 1. Perspectives in Economic Sociology 2. Forms of Exchange 3. Systems of Production and Consumption 4. Some Contemporary Issues in Economic Sociology CC-9 Population Studies 1. Introducing Population Studies 2. Population, Social Structure and Processes 3. Population, Gender and Migration. 4. Population Dynamics and development **CC-10 Social Stratification** 1. Introducing Stratification 2. Theories of Stratification 3. Identities and Inequalities 4. Mobility and Reproduction					√	√	√	

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**			

		A	B	C	D	E	F	G	H
THIRD YEAR SEMESTER V (6 Months) THIRD YEAR SEMESTER VI (6 Months)	**CC-11 Sociological Thinker I** 1. Origin & development of sociology as a distinct discipline 1.1 European Enlightenment; French, American & Industrial Revolutions 1.2Montesquieu & St. Simon 1.3 Auguste Comte 2. Karl Marx 3. Max Weber 4. Emile Durkheim **CC-12 Research Methods – I** 1. The Logic of Social Research 2. Methodological Perspectives 3. Modes of Enquiry 4. Research Project -I: Writing a Research Proposal		√						√
	CC-13 Sociological Thinkers II 1. Orientation to Post Classical Theories 2. Talcott Parsons 3. Claude Levi-Strauss 4. G. H. Mead and Erving Goffman 5. Peter L. Berger and Thomas Luckmann 6. Max Horkheimar, T.W. Adorno and Herbert Marcuse **CC-14 Research Methods – II** **1. Doing Social Research** 1.1 The Process of Social Research 1.2 Research Design 1.3 Sampling 1.4 Field (Issues and Context) **2. Statistical Methods** 2.1 Levels of Measurement 2.2 Frequency Distribution 2.3 Graphic techniques 2.4 Measurement of Central Tendency 2.5 Measures of Dispersion 3. Research Project –II		√						√

Department of Physics

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Physics (Honours) under CBCS (Notification No. CSR/12/18)

in effect from 2018-19

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	**To prepare the students for a successful career in industry as well as to motivate them for higher education and to take research as a career**
PO B	**To provide strong foundation in basic sciences and mathematics**
PO C	**To identify, formulate and analyse complex scientific problems reaching substantiated conclusions**
PO D	**To develop individual and team work by functioning effectively as an individual or as a member in a group in laboratory classes**
PO E	**Ability to use modern techniques, sophisticated instruments, current application software and to handle different types of electrical and electronic circuits**
PO F	**To develop computational acumen in solving different analytical problems of Physics**
PO G	**To develop communicating ability such as being able to comprehend and write effective laboratory notebooks and design documentation, prepare effective presentations, and give and receive clear instructions**
PO H	**To develop an opportunity to work in interdisciplinary groups**
PO I	**To develop the ability to engage in independent and life-long learning in the current context of technological change**
PO J	**To inculcate scientific temperament in the young minds and outside the scientific community**

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	**Apply knowledge in emerging and varied areas of Physics for higher studies, research and industries related to software and hardware applications**
PSO 2	**Develop leadership and managerial skills and understanding the need for lifelong learning to be a competent professional**
PSO 3	**To equip with front level communication technologies (ICT) for innovating ideas and solutions to existing/novel challenges**
PSO 4	**To be acquainted with good laboratory practices and safety measures**

Mapping of PO & PSO for Physics Hons Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	Programme Outcomes (PO)									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
PSO 1	√	√	√		√	√	√			
PSO 2	√			√			√		√	√
PSO 3	√				√	√		√		
PSO 4	√			√	√			√		

Programme Outcome mapping for Semester wise Courses in Physics Honours under University of Calcutta

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER-I	PHS-A-CC-1-1-TH, Mathematical Physics – I(Theory)	√	√	√		√	√		√	√	√
	PHS-A-CC-1-1-P, Mathematical Physics - I (Practical)	√	√	√	√	√	√		√	√	

Papers:	PHS-A-CC-1-2-TH Mechanics (Theory)	√	√	√		√	√		√		√
	PHS-A-CC-1-2-P Mechanics (Practical)	√	√	√	√	√			√		√

TABLE II

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER-2 **Papers:**	PHS-A-CC-2-3-TH, Electricity and Magnetism (Theory)	√	√	√		√				√	√
	PHS-A-CC-2-3-P, Electricity and Magnetism (Practical)	√	√		√	√		√		√	√
	PHS-A-CC-2-4-TH Waves and Optics (Theory)	√	√	√		√	√			√	√
	PHS-A-CC-2-4-P Waves and Optics (Practical)	√			√	√		√			√

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER- 3 **Papers:**	PHS-A-CC-3-5-TH, Mathematical Physics - II (Theory)	√	√	√		√	√		√	√	√
	PHS-A-CC-3-5-P, Mathematical Physics - II (Practical)	√	√	√	√	√	√			√	
	PHS-A-CC-3-6-TH, Thermal Physics (Theory)	√	√						√	√	
	PHS-A-CC-3-6-P, Thermal Physics (Practical)	√			√	√		√			√

	PHS-A-CC-3-7-TH Digital Systems and Applications (Theory)	√			√	√				√	
	PHS-A-CC-3-7-P Digital Systems and Applications (Practical)	√	√		√	√		√	√	√	

TABLE IV

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER- 4 **Papers:**	PHS-A-CC-4-8-TH, Mathematical Physics - III (Theory)	√	√	√		√	√		√	√	√
	PHS-A-CC-4-8-P, Mathematical Physics - III (Practical)	√	√	√	√	√	√			√	
	PHS-A-CC-4-9-TH, Elements of Modern Physics (Theory)	√	√	√					√	√	√
	PHSA-CC-4-9-P, Elements of Modern Physics (Practical)	√	√	√	√	√		√			√
	PHS-A-CC-4-10-THAnalog Systems and Applications (Theory)	√			√	√				√	
	PHS-A-CC-4-10-P Analog Systems and Applications (Practical)	√			√	√		√		√	

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TABLE V

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER- 5 **Papers:**	PHS-A-CC-5-11-TH, Quantum Mechanics and Applications (Theory)	√	√	√			√		√	√	√
	PHS-A-CC-5-11-P, Quantum Mechanics and Applications (Practical)	√	√	√		√	√			√	
	PHS-A-CC-5-12-TH, Solid State Physics (Theory)	√	√	√							√
	PHS-A-CC-5-12-P, Solid State Physics (Practical)	√	√	√	√	√	√			√	
	DSE A1 Laser and Fiber Optics (Theory)	√	√					√	√		√
	DSE B1 Nuclear & Particle Physics - (Theory)	√	√	√					√	√	√

TABLE VI

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
SEMESTER- 6 **Papers:**	PHS-A-CC-6-13-TH, Electromagnetic Theory (Theory)	√	√							√	
	PHS-A-CC-6-13-P, Electromagnetic Theory (Practical)		√	√			√	√			
	PHS-A-CC-6-14-THStatistical Mechanics (Theory)	√	√	√					√		√
	PHS-A-CC-6-14-P Statistical Mechanics (Practical)	√	√	√			√		√		

Department of Chemistry

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Honours

(CBCS)

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	To prepare the students for a successful career in industry, to motivate them for higher education and to take up research as a career
PO B	To provide strong foundation in basic sciences and mathematics
PO C	To identify, formulate and analyze complex scientific problems
PO D	To develop individual and team work by functioning effectively as an individual or as a member in a group in laboratory classes
PO E	Introduction to advanced instrumentation using modern experimental techniques, ability to independently execute experiments in specially designed chemical glassware as well as handling sophisticated digital instruments
PO F	To develop communication skillssuch as being able to comprehend and write well-documented laboratory notebooks in a structured, focused and meticulous manner, prepare effective presentations, and give and receive clear instructions
PO G	To develop an opportunity to work in interdisciplinary groups
PO H	To inculcate scientific temperament in young minds and outside the scientific community

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	Apply knowledge in emerging and varied areas of Chemistry for higher studies, research and industry and to be acquainted with state-of the art techniques &technologies
PSO 2	To develop leadership and managerial skills promoting the need for lifelong learning as required for a competent professional
PSO 3	To develop a neat experimental hand in conformity with good laboratory practices including safety measures

Mapping of PO & PSO for ChemistryHons Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	PROGRAM OUTCOMES (PO)							
	A	B	C	D	E	F	G	H
PSO 1	√	√	√			√	√	√
PSO 2	√	√	√			√	√	√
PSO 3	√	√	√	√	√	√	√	√

TABLE I (SEMESTER-1)

COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Semester-1 6 months **PHYSICAL CHEMISTRY-1**	**CEMA- CC-1-2**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
CEMA-CC-1-2-TH	Kinetic Theory & Gaseous State		√	√				√	√
	Transport Processes		√					√	√
	Chemical Kinetics	√	√			√	√		
CEMA-CC-1-2-P	Physical Chemistry Practical		√		√	√	√	√	√

COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
First Semester 6 Months **INORGANIC CHEMISTRY- 1**	**CORE COURSES- CEMA-CC-1-1-TH**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
	1) Extra nuclear Structure of atom	√	√	√				√	√
	2) Acid-Base reactions	√	√	√				√	√
	3) Redox reactions	√	√	√				√	√
	CEMA-CC-1-1-P INORGANIC CHEMISTRY: I (1) LAB								
	1)Acid and Base Titrations: (DEMO ONLY) 2)Oxidation-Reduction Titrations:	√	√	√	√	√	√	√	√

	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Paper	**Semeter-I Six months**		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Organic Chemistry-1A	**CEMA – CC-1-1(Th)**	Bonding & Physical Properties	√	√	√				√	
		General Treatment of	√	√	√				√	

		Reaction Mechanism								
	CEMA – CC-1-1(Pr)	Separation of Components of a binary solid mixtures	√	√	√	√		√		
Organic Chemistry-1B	**CEMA – CC-1-2(Th)**	Stereochemistry I	√	√	√				√	
		General Treatment of Reaction Mechanism	√	√	√				√	
	CEMA – CC-1-2(Pr)	Determination of Boiling Points				√		√		

TABLE II (SEMESTER-2)

Semeter- II (Six months) --------- NO CORE COURSE IN PHYSICAL CHEMISTRY

	COURSE DURATION	**COURSE DETAIL**	**PROGRAM OUTCOMES (PO)**							
Paper			**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Organic Chemistry - 2	**CEMA – CC-2-3(Th)**	Sterochemistry II	√	√	√				√	
		General Treatment of Reaction Mechanism III	√	√	√				√	
		Substitution and Elimination Reactions		√	√				√	
	CEMA – CC-2-3(Pr)	Organic Preparations	√			√	√	√		

Second Semester 6 Months	**CEMA-CC-2-4-TH**								
	Chemical Bonding-I	√	√	√				√	√
INORGANIC CHEMISTRY-2	Chemical Bonding-II	√	√	√				√	√
	Radioactivity	√	√	√				√	√
	CEMA-CC-2-4-P								
	Iodo-/ Iodimetric Titrations 1. Estimation of Vitamin C 2. Estimation of (i) arsenite and (ii) antimony	√	√	√	√	√	√	√	√

	iodimetrically 3. Estimation of available chlorine in bleaching powder. Estimation of metal content in some selective samples 1. Estimation of Cu in brass. 2. Estimation of Cr and Mn in Steel. 3. Estimation of Fe in cement								

TABLE III (SEMESTER-3)

COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
		A	B	C	D	E	F	G	H
Semester-3 Six months **PHYSICAL CHEMISTRY-2**	**CEMA- CC-3-5**								
CEMA-CC-3-5-TH	Chemical thermodynamics-1	√	√	√				√	√
	Chemical thermodynamics-1I	√	√	√				√	√
	Systems of Variable Composition		√	√			√		√
	Electrochemistry					√		√	√
CEMA-CC-3-5-P	Physical Chemistry Practical		√	√	√	√	√	√	√

	COURSE DURATION	COURSE DETAIL								
Paper	**Semeter-III Six months**		A	B	C	D	E	F	G	H
Organic Chemistry- 3	**CEMA – CC- 3-7(Th)**	Chemistry of Alkenes and Alkynes		√	√				√	√
		Aromatic Substitution		√				√		

		Carbonyl and Related Compounds	√	√	√				√	
		Organometallics				√	√	√		
	CEMA – CC- 3-7(Pr)	Identification of a Pure Organic Compound (Solid and Liquid) & Quantitative Estimations				√	√	√		
Third Semester 6 Months **INORGANIC CHEMISTRY-3**	**CEMA-CC-3-6-TH**									
	Chemical periodicity			√	√				√	√
	Chemistry of *s* and *p* Block Elements			√						√
	Noble Gases		√	√					√	√
	Inorganic Polymers		√	√					√	√
	Coordination Chemistry-I		√	√	√				√	√
	CEMA-CC-3-6-P									
	1) Complexometric titration 2) Chromatography of metal ions 3) Gravimetry		√	√	√	√	√	√	√	√

Paper	**COURSE DURATION**	**COURSE DETAIL** **SEC-1: MATHEMATICS AND STATISTICS FOR CHEMISTS**	**PROGRAMME OUTCOME (PO)**							
		Paper: Some Methods in Applied Mathematics	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
SEC A		**Course: Numerical Analysis(Gr.-B)**								
		Unit-1: Computer Number		√	√	√	√	√		√

		System								
		Unit-2: Numerical Solution of System of Linear Equations	√	√	√		√		√	√
		Unit-3: Solution of Non-linear Equations	√	√	√		√		√	√
	Semester-	Unit-4: Numerical Integration	√	√	√		√		√	√
		Unit-5: Introduction to Numerical Solution of Differential Equation		√	√		√		√	√
	6 Months	**Course: Differential Equation(Gr. A)**								
		Unit-1: Ordinary Differential Equation		√	√					√
		Unit-2: Partial Differential Equation		√	√					√

	COURSE DURATION	**COURSE DETAIL**	**PROGRAM OUTCOMES (PO)**							
Paper	**Semester-III Six months**	**ANALYTICAL CLINICAL BIOCHEMISTRY**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
SEC- A	**SEC2**	Carbohydrates:	√	√	√				√	√
		Proteins	√	√	√				√	√
		Enzymes	√	√	√				√	√
		Lipids	√	√	√				√	√
		Lipoproteins	√	√	√				√	
		RNA	√	√	√				√	
		Biochemistry of disease	√	√	√				√	√
		Blood	√	√	√				√	√
		Urine	√	√	√				√	√

TABLE IV (SEMESTER-4)

COURSE DURATION	**COURSE DETAIL**	**PROGRAM OUTCOMES (PO)**							
Semester-4 Six months	**CEMA- CC-4-9**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
PHYSICAL CHEMISTRY-3									
	Application of Thermodynamics-II		√	√		√		√	√

CEMA-CC-4-9-TH	Foundation of Quantum Mechanics	√	√ √	√				√	√
	Crystal Structure	√		√				√	
CEMA-CC-4-9-P	Physical Chemistry Practical		√	√	√	√	√	√	√

	COURSE DURATION	**COURSE DETAIL**	**PROGRAM OUTCOMES (PO)**							
Paper	**Semeter-IV Six months**		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Paper Organic Chemistry - 4	**CEMA – CC-4-8(Th)**	Nitrogen Compounds	√	√					√	
		Rearrangements	√	√	√				√	
		The Logic of Organic Synthesis	√	√	√				√	
		Organic Spectroscopy	√	√	√		√		√	√
	CEMA – CC-4-8(Pr)	Qualitative Analysis of Single solid Organic Compounds		√		√		√		

Fourth Semester 6 Months **INORGANIC CHEMISTRY-4**	**CEMA-CC-4-10-TH**								
	Coordination Chemistry-II	√	√	√				√	√
	Chemistry of d- and f- block elements • Transition Elements • Lanthanoids and Actinoids	√	√					√	√
	Reaction Kinetics and Mechanism	√	√	√				√	√
	CEMA-CC-4-10-P								
	Inorganic preparations 1. $[Cu(CH_3CN)_4]PF_6/ClO_4$ 2. Cis and trans $K[Cr(C_2O_4)_2 (H_2O)_2]$ 3. Potassium diaquadioxalatochromate(III) 4. Tetraamminecarbonatocobalt (III) ion 5. Potassium tris(oxalato)ferrate(III) 6. Tris-(ethylenediamine) nickel(II) chloride. 7. $[Mn(acac)_3]$ and $Fe(acac)_3]$ (acac= acetylacetonate) *Instrumental Techniques* 1. Measurement of 10Dq by spectrophotometric method.	√	√		√	√	√	√	√

	2. Determination ofλmax of $[Mn(acac)_3]$ and $[Fe(acac)_3]$ complexes								

	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Paper	**Semester-IV Six months**	**PHARMACEUTICALS CHEMISTRY**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
SEC- B	**SEC3**	Drug discovery	√	√	√				√	√
		Pharmaceuticals	√						√	√
		Antibacterial and Antifungal agents	√	√	√				√	√
		Central Nervous System agents	√	√	√				√	√
		Cardiovascular	√	√	√				√	√
		HIV-AIDS related drugs	√	√	√				√	√
		Fermentation	√	√	√				√	√
		Antibiotics	√	√	√				√	√
		Vitamin	√	√	√				√	√

TABLE V (SEMESTER-5)

COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Sem-5 Six months **PHYSICAL CHEMISTRY-4**	**CEMA- CC-5-11**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
CEMA-CC-5-11-TH	Quantum Chemistry II	√	√	√				√	√
	Statistical thermodynamics	√	√	√				√	√
	Numerical Analysis		√	√			√	√	√
CEMA-CC-5-11-P	Physical Chemistry Practical: Computer programs based on numerical methods		√	√	√	√	√	√	√

Paper	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
	Semeter-V Six months		A	B	C	D	E	F	G	H
Paper Organic Chemis-try- 5	CEMA – CC- 5-12(Th)	Carbocycles and Heterocycles	√	√	√				√	
		Cyclic Stereochemistry	√	√	√					
		Pericyclic Reactions	√	√	√				√	
		Carbohydrates		√	√				√	√
		Biomolecules	√	√	√				√	√
	CEMA – CC- 5-12(Pr)	Chromatographic Separations	√		√	√	√	√	√	
		Spectroscopic Analysis of Organic Compounds	√	√	√	√	√	√	√	√

	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Paper	Semester-V Six months		A	B	C	D	E	F	G	H
DSE-A2	DSE-A2: Applications of Computers in Chemistry (Theory)	**Computer Programming Basics (FORTRAN):** Elements of FORTRAN Language. FORTRAN Keywords and commands, Logical and Relational Operators. Iteration, Array variables, Matrix addition and multiplication. Function and Subroutine.	√	√	√				√	
		Introduction to Spreadsheet Software(MS Excel): Creating a Spreadsheet, entering and formatting information, basic functions and formulae, creating charts, tables and graphs. Incorporating tables and graphs into word processing documents, simple calculations.	√	√	√			√		
		Solution of simultaneous equations(for eg: in chemical Equilibrium problems) using Excel **SOLVER** Functions.	√	√	√				√	

		Use of Excel **Goal Seek** function.								
		Numerical Modelling: Simulation of pH metric titration curves, Excel functions **LINEST** and Least Squares. Numerical Curve Fitting, Regression, Numerical Differentiation and Integration	√	√	√				√	
		Statistical Analysis: Gaussian Distribution and Errors in Measurement and their effect on data sets. Descriptive Statistics using Excel, Statistical Significance Testing, the T test and the F test.	√	√	√		√	√	√	
DSE-A2	**DSE-A2: Applications of Computers in Chemistry (Practicals)**	1. Plotting of Graphs using a spreadsheet. (Planck's Distribution Law, Maxwell Boltzmann Distribution Curves as a function of temperature and molecular weight) 2. Determination of vapour pressure from Van der Waals Equation of State. 3. Determination of rate constant from Concentration-time data using **LINEST** function. 4. Determination of Molar Extinction Coefficient from Absorbent's data using **LINEST** function. 5. Determination of concentration simultaneously using Excel **SOLVER** Function. (For eg: Determination of [OH-], [Mg2+] and [H3O+] from Ksp and Kw data of Mg(OH)2.) 6. Simultaneous Solution of Chemical Equilibrium Problems to determine the equilibrium compositions from the Equilibrium Constant data at a given Pressure and Temperature. 7. Determination of Molar Enthalpy of Vaporization using Linear and Non Linear Least squares fit. 8. Calculation and Plotting of a Precipitation Titration Curve with MS Excel.	√	√	√	√		√	√	

		9. Acid-Base Titration Curve using Excel **Goal Seek** Function. 10. Plotting of First and Second Derivative Curve for pH metric and Potentiometric titrations. 11. Use of spreadsheet to solve the 1D Schrodinger Equation (Numerov Method). 12. Michaelis-Menten Kinetics for Enzyme Catalysis using Linear and Non – Linear Regression								

Fifth Semester 6 Months	**DSE-B-1: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**								
	Silicate Industries • *Glass* • *Ceramics* • *Cements*	√	√	√				√	√
	Fertilizers	√	√	√	√			√	√
	Surface Coatings	√	√	√				√	√
	Batteries	√	√	√				√	√
	Alloys	√	√	√				√	√
	Catalysis	√	√	√				√	√
	Chemical explosives	√	√	√				√	√
	PRACTICALS-DSE B-1: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE								
	1. Determination of free acidity in ammonium sulphate fertilizer. 2. Estimation of Calcium in Calcium ammonium nitrate fertilizer. 3. Estimation of phosphoric acid in superphosphate fertilizer. 4. Electroless metallic coatings on ceramic and plastic material. 5. Determination of composition of dolomite (by complexometric titration). 6. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples. 7. Analysis of Cement.	√	√		√	√	√	√	√
	DSE B-2: NOVEL INORGANIC SOLIDS								
	1.Synthesis and modification of inorganic solids	√	√					√	√
	2.Nanomaterials	√	√	√				√	√
	3.Introduction to engineering materials for mechanical construction	√	√	√				√	√
	4.Composite materials	√	√	√				√	√
	5.Speciality polymers:	√	√	√				√	√
	PRACTICAL – DSEB-2: NOVEL INORGANIC SOLIDS								
	1. Determination of cation exchange method 2. Determination of total difference of solids. 3. Synthesis of hydrogel by co-precipitation method. 4. Synthesis of silver and gold metal nanoparticle	√	√		√	√	√	√	√

TABLE VI (SEMESTER-6)

Semeter-VI (Six months) --------- NO CORE COURSE IN ORGANIC CHEMISTRY

COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Sem-6 Six Months **PHYSICAL CHEMISTRY-5**	**CEMA- CC-6-14**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
CEMA-CC-6-14-TH	Molecular Spectroscopy	√		√		√		√	√
	Photochemistry & Theory of Reaction rate		√	√					√
	Surface Phenomenon		√	√				√	
CEMA-CC-6-14-P	Physical Chemistry Practical		√	√	√	√	√	√	√

Sixth Semester 6 months **INORGANIC CHEMISTRY-5**	**CEMA-CC-6-13-TH**								
	Theoretical Principles in Qualitative Analysis	√	√				√	√	√
	Bioinorganic Chemistry	√	√	√				√	√
	Organometallic Chemistry	√	√	√				√	√
	Catalysis by Organometallic Compounds	√	√	√				√	√
	CEMA-CC-6-13-P								
	Qualitative semimicro analysis of mixtures containing not more than three radicals. Emphasis should be given to the understanding of the chemistry of different reactions. Cation Radicals:Na^{+},K^{+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Al^{3+}, Cr^{3+}, Mn^{2+}/Mn^{4+}, Fe^{3+}, Co^{2+}/Co^{3+},Ni^{2+}, Cu^{2+}, Zn^{2+}, Pb^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}/Sn^{4+}, As^{3+}/As^{5+}, $Sb^{3+/5+}$, NH_4^{+}, Mg^{2+}. Anion Radicals: F^{-}, Cl^{-}, Br^{-}, BrO_3^{-}, I^{-}, IO_3^{-}, SCN^{-}, S^{2-}, SO_4^{2-}, NO^{3-}, NO^{2-}, PO_4^{3-},AsO_4^{3-}, BO_3^{3-}, CrO_4^{2-}/ $Cr_2O_7^{2-}$, $Fe(CN)_6^{4-}$, $Fe(CN)_6^{3-}$. Insoluble Materials: Al_2O_3(ig), Fe_2O_3(ig), Cr_2O_3(ig), SnO_2, $SrSO_4$, $BaSO_4$, CaF_2,	√	√		√	√	√	√	√

	$PbSO_4$.								

	COURSE DURATION	COURSE DETAIL	PROGRAM OUTCOMES (PO)							
Paper	**Semester-VI Six months**	**GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
DSE	**DSE – A3**	Introduction to Green Chemistry	√	√	√				√	√
		Principles of Green Chemistry	√	√	√				√	√
		Designing a Chemical synthesis	√	√	√				√	
		Examples of Green Synthesis	√	√	√				√	
		Microwave assisted reactions in water	√		√		√		√	
		Ultrasound assisted reactions	√		√		√		√	
		Green counterpart of common organic reactions	√		√				√	
		Rearrangement reactions by green approach	√	√	√				√	
		Future Trends in Green Chemistry	√	√	√				√	√
		Alkaloids	√	√	√				√	√
		Terpenes	√	√	√				√	√

Department of Mathematics

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Mathematics (Honours)

(CBCS)

Programme OutcomesNos	Programme Outcomes (PO)
PO A	**To prepare the students for a successful career in teaching or other professions as well as to motivate them for higher education and to take research as a career**
PO B	**To provide strong foundation in basic sciences and mathematics**
PO C	**To identify, formulate and analyze complex scientific problems reaching substantiated conclusions**
PO D	**To develop individual and team work by functioning effectively as an individual or as a member in a group in computer laboratory classes**
PO E	**To develop computational , logical and analyzing ability in solving different problems of Mathematics**
PO F	**To develop communicating ability, prepare effective presentations, and give and receive clear instructions**
PO G	**To develop the ability to engage in independent and life-long learning in the current context of technological change**
PO H	**To inculcate scientific temperament in the young minds and outside the scientific community**

Programme Specific OutcomesNos	ProgrammeSpecific Outcomes (PSO)
PSO 1	**To apply knowledge in emerging and varied areas of Mathematics for higher studies, research and industries related to software applications**
PSO 2	**To develop leadership and managerial skills and understanding the need for lifelong learning to be a competent professional**
PSO 3	**To equip with front level communication technologies (ICT) for innovating ideas and solutions to existing/novel challenges**
PSO 4	**To be acquainted with good laboratory practices**

Mapping of PO & PSO forMathematics Hons Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	ProgrammeSpecific Outcomes (PSO)							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
PSO 1	√	√	√		√	√		√
PSO 2	√	√	√	√		√	√	√
PSO 3	√	√	√		√			
PSO 4	√	√	√	√			√	

Programme Outcome mapping for Partial Semester wise Courses in Mathematics Honoursunder University of Calcutta

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester I **Core Course-1& 2**	**Core Course-1** Calculus, Geometry & Vector Analysis	√	√	√		√	√		√
	Core Course-2 Algebra	√	√	√		√	√		√

TABLE II

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester II **Core Course-3 & 4**	**Core Course-3** Real Analysis	√	√	√		√		√	√
	Core Course-4 Group Theory-I	√	√	√				√	√

TABLE III

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester III **Core Course-5, 6 , 7 &SEC A**	**Core Course-5** Theory of Real Functions	√	√	√		√			√
	Core Course-6 Ring Theory & Linear Algebra-I	√	√	√		√		√	√
	Core Course-7 Ordinary Differential Equation & Multivariate Calculus-I	√	√	√				√	√
	SEC A C Programming Language	√		√	√	√	√	√	√

TABLE IV

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester IV **Core Course-8, 9& 10 &SEC B**	**Core Course-8** Riemann Integration & Series of Functions	√	√	√		√			√
	Core Course-9 Partial differential equation & Multivariate Calculus-II	√	√	√				√	√
	Core Course-10 Mechanics	√	√	√				√	√
	SEC A Scientific computing with SageMath& R	√		√	√	√	√	√	√

TABLE V

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester V **Core Course-11, 12&DSE-A (1), DSE-B(1)**	**Core Course-11** Probability & Statistics	√	√	√		√	√	√	√
	Core Course-12 Group Theory-II & Linear Algebra-II	√	√	√		√		√	√
	DSE-A (1) Advanced Algebra	√	√	√		√		√	√
	DSE-B(1) Linear Programming & Game Theory	√	√	√		√		√	√

TABLE VI

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)							
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Semester VI **Core Course-13, 14&DSE-A (2), DSE-B(2)**	**Core Course-13** Metric Space & Complex Analysis	√	√	√		√	√	√	√
	Core Course-14 Numerical Methods	√			√	√	√	√	√
	Core Course-14 (Practical) Numerical Methods Lab	√		√	√	√	√	√	√
	DSE-A(2) Differential Geometry	√	√	√		√		√	√
	DSE-B(2) Point Set Topology	√	√	√		√	√	√	√

Department of Economics

Model Reference: University of Calcutta, CBCS Syllabus for Economics (Honours)

with effect from 2018-19

Programme Outcomes No.s	Programme Outcomes (PO)
PO A	**To motivate and prepare the students for pursuing higher education in Economics and inter-allied disciplines and to make them competent to pursue a successful career in academics / industry / entrepreneurship.**
PO B	**To provide strong foundation in Economic theory, focusing on their applied and policy issues, Mathematics and Statistics and to develop the ability of applying quantitative tools and techniques in solving economic problems.**
PO C	**To develop the ability to engage in independent and life-long learning in the context of dynamic socio- politico-economic scenarios.**
PO D	**To develop communication skills such as being able to comprehend and write reports on socio-economic problems, design documentation, make effective presentations and give and receive clear instructions.**
PO E	**To inculcate logical, data based and analytical temperament in young minds.**

Programme Specific Outcomes No.s	Programme Specific Outcomes (PSO)
PSO 1	**Possess essential knowledge required to innovate and design effective solutions in various contemporary and emerging areas of Economics.**
PSO 2	**Engage and succeed in academic / professional careers through team work, leadership and managerial skills, ethical behavior, effective communication and understanding the need for lifelong learning.**
PSO 3	**Develop analytical abilities through interactive and participative learning.**
PSO 4	**Utilize Information and Communication Technology (ICT) and its multi-faceted dimensions for innovating ideas and acquiring new ideas in emerging varied areas of Economics**

Mapping of PO & PSO for Economics Honours CBCS Syllabus

University of Calcutta, with effect from 2018-19

Programme Specific Outcomes (PSO) No.s	ProgrammeOutcomes (PO)				
	A	**B**	**C**	**D**	**E**
PSO 1	√	√	√	√	√
PSO 2	√		√	√	
PSO 3	√	√	√	√	√
PSO 4	√	√	√	√	√

Programme Outcome mapping for Chioce Based Credit System Semester wise Courses in Economics Honours

University of Calcutta, with effect from 2018-19

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	**B**	**C**	**D**	**E**
Semester I	CC 1-1 Introductory Microeconomics	√	√	√	√	√
	CC 1-2 Mathematical Methods for Economics-I	√	√	√		√
Semester II	CC 2-3 Introductory Macroeconomics	√	√	√	√	√
	CC 2-4 Mathematical Methods for Economics-II	√	√	√		√

TABLE II

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	**B**	**C**	**D**	**E**
Semester III	CC 3-5 Intermediate Microeconomics-I	√	√	√	√	√
	CC 3-6 Intermediate Macroeconomics-I	√	√	√	√	√
	CC 3-7 Statistics for Economics	√	√	√		√
	SEC 3-1A Data Analysis / Rural Development	√ √	√	√ √	√ √	√ √
Semester IV	CC 4-8 Intermediate Microeconomics-II	√	√	√	√	√
	CC 4-9 Intermediate Macroeconomics-II	√	√	√	√	√
	CC 4-10 Introductory Econometrics	√	√	√		√
	SEC 4-2B Research Methodology / Managerial Economics	√ √	√	√ √	√ √	√ √

TABLE III

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	**B**	**C**	**D**	**E**
Semester V	CC 5-11 International Economics	√	√	√	√	√
	CC 5-12 Indian Economy	√	√	√	√	√
	DSE A(1) Applied Econometrics / Economic History of India	√ √	√ √	√ √		√ √
	DSE B(1) Comparative Economic Development /	√ √	√	√ √	√ √	√ √

Semester VI	Financial Economics					
	CC-6-13 Public Economics	√	√	√	√	√
	CC-6-14 Development Economics	√		√	√	√
	DSE-A(2) Money and Financial Markets / Issues in Indian Economy	√ √	√	√ √	√ √	√ √
	DSE-B(2) Environmental Economics / Issues in Development Economics	√ √	√ √	√ √	√ √	√ √

DEPARTMENT OF ZOOLOGY
PROGRAM OUTCOME, PROGRAM SPECIFIC OUTCOME AND COURSE OUTCOME
2018-19

B.Sc. IN ZOOLOGY

Model Reference: Syllabus for Zoology (Honours), University of Calcutta, With effect from 2018

- The CBCS course came into effect from August 2018. The Syllabus was designed by the University of Calcutta in 2018 and consists of 14 core papers (CC), 4 Discipline specific elective papers (DSE) with each paper having theory and practical components and 2 papers of Skill Enhancement Course (SEC) all which are distributed over six semesters.

PROGRAM OUTCOME

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	To provide a sound knowledge and understanding of basic and applied Zoology
PO B	To prepare the students for a successful career in teaching, wildlife projects, industries, etc. and also to motivate them for higher education and to take up research as a career
PO C	Ability to use modern techniques and handle sophisticated instruments for experimental work and also apply current software for data analysis
PO D	To develop the ability to communicate and comprehend; documentation and effective writing of laboratory notebooks, field reports and environmental audit reports, prepare effective presentations, and give and receive clear instructions
PO E	To develop capability for individual and team work by functioning effectively as an individual or as a member in a group in laboratory classes
PO F	To develop an opportunity to work in interdisciplinary groups or areas
PO G	To inculcate scientific temperament in the young minds and outside the scientific community
PO H	Apply the knowledge and understanding of Zoology to one's own life , work and community
PO I	Develop leadership and managerial skills and understanding the need for lifelong learning to be a competent professional

PROGRAM SPECIFIC OUTCOME

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	Understand the nature and basic concepts of Cell biology, Genetics, Taxonomy, Physiology, Biochemistry, Microbiology, Immunology, Endocrinology, Reproductive biology, Parasitology, Biotechnology, Molecular Biology, Developmental Biology, Ecology
PSO 2	Understand the invertebrate and vertebrate members of the zoological world; the complex evolutionary processes , behaviour of animals and insect biology
PSO 3	Understand biodiversity and protection of endangered species, environmental

	conservation processes and its importance, Pollution control
PSO 4	Gain knowledge of Agro based Small Scale industries like sericulture, apiculture, fishery and aquarium fishery
PSO 5	Understand the basic concepts of genetics and its importance in human health and medicine
PSO 6	To be acquainted with good laboratory practices and safety measures, understand and apply ethical principles and commit to professional ethics and responsibilities

Programme Outcome mapping for Annual Courses in Zoology Honours under University of Calcutta

TABLE I

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
PART I; SEM I	CC 1 Non Chordata – I (Protists to Pseudocoelomates)	√	√		√	√			√	√
	CC 2 Molecular Biology	√	√	√	√	√	√	√	√	√
PART I; SEM II	CC 3 Non Chordata – II (All Coelomate Phyla)	√	√		√	√			√	√
	CC 4 Cell Biology	√	√	√	√	√	√	√	√	√
PART II; SEM III	CC 5 Chordata	√	√		√	√			√	√
	CC 6 Animal Physiology: Controlling & Co-ordinating System	√	√	√	√	√	√	√	√	√
	CC7 Fundamentals of Biochemistry	√	√	√	√	√	√	√	√	√
	SEC-A(1) Apiculture	√	√						√	√
PART II; SEM IV	CC 8 Comparative Anatomy of Vertebrate	√	√	√	√	√			√	√
	CC 9 Animal Physiology: Life sustaining system	√	√	√	√	√	√	√	√	√
	CC10 Immunology	√	√	√	√	√	√	√	√	√
	SEC-B(1) Aquarium Fisheries	√	√						√	√

PART III; SEM V	CC 11 Ecology	√	√	√	√	√	√	√	√	√
	CC 12 Principle of Genetics	√	√	√	√	√	√	√	√	√
	DSE A(1/2) Parasitology/Biology of Insect	√	√	√	√	√	√	√	√	√
	DSE B (1/2) Endocrinology/Reproductive Biology	√	√	√	√	√	√	√	√	√
PART III; SEM VI	CC 13 Developmental Biology	√	√	√	√	√	√	√	√	√
	CC 14 Evolutionary Biology	√	√	√	√	√	√		√	√
	DSE A (1/2) Animal biotechnology/Animal Cell Biotechnology	√	√	√	√	√	√	√	√	√
	DSE B (1/2) Animal Behaviour & Chronology/Fish & Fisheries	√	√	√	√	√	√		√	√

TABLE 2

Mapping of PO & PSO for Zoology Honours Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	**Programme Outcomes (PO)**								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
PSO 1	√	√	√	√	√	√	√	√	√
PSO 2	√	√		√	√	√	√	√	
PSO 3	√	√		√	√	√	√	√	√
PSO 4	√	√			√	√	√	√	√
PSO 5		√	√		√	√	√	√	√
PSO 6		√	√		√	√	√	√	√

COURSE OUTCOME (CBCS)

PART I: SEMESTER 1

CC 1 - Theory
Non-chordata – I (Protists to Pseudocoelomates)

After successfully completing this course, students will be able to:

CO1	Have a concept of the basics of classification, systematics, taxonomy, taxonomic hierarchy and types; Codes of zoological nomenclature
CO2	Know the Classification of invertebrates till Nematoda
CO3	Have knowledge on locomotion and reproduction in Protozoa, Life cycle and pathogenicity of *Plasmodium vivax* and *Entamoeba histolytica*
CO4	Have a concept of evolution of symmetry and segmentation of Metazoa, Canal system of Porifera, Coral reefs, its biodiversity and its conservation
CO5	Know about the Life cycle and pathogenicity and control measures of *Fasciola hepatica* and *Taenia solium, Ascaris lumbricoides* and *Wuchereria bancrofti*, Parasitic adaptations in helminthes

CC 1 - Practical
Non-chordata – I Lab (Protists to Pseudocoelomates)

CO1	Identify and classify invertebrates by studying their external characters and prepare keys
CO2	Study of whole mount of *Euglena*, *Amoeba* and *Paramoecium.*
CO3	Staining/mounting and identification of any protozoa/helminth from gut of *Periplaneta* sp

CC 2 - Theory
Molecular Biology

After successfully completing this course, students will be able to:

CO1	Describe the Salient features of DNA, Chargaff's Rule, Hypo and Hyperchromic shift. Watson and Crick Model of DNA. RNA types & Function.
CO2	Know the Molecular basis of DNA replication, transcription, translation, post transcriptional modifications, RNA processing
CO3	Have a concept of molecular basis of gene regulation
CO4	Have a knowledge of the types of DNA repair mechanisms like RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair
CO5	Know about the Molecular Techniques - PCR, Western and Southern blot, Northern Blot

CC 2 - Practical

Molecular Biology - Lab

After successfully completing this course, students will be able to:

CO1	Identify polytene and lampbrush chromosome from photograph
CO2	Isolate and quantify genomic DNA from goat liver.
CO3	Demonstrate agarose gel electrophoresis for DNA.
CO4	Histologically differentially stain DNA and RNA in prepared slides

PART I: SEMESTER 2

CC 3 – Theory
Non-Chordates II – Coelomates

After successfully completing this course, students will be able to:

CO1	Have a concept about evolution of coelom
CO2	Have a knowledge on general characteristics and classification of annelids to hemichordates
CO3	Know about the evolutionary significance of Onychophora in the animal kingdom, Relationship of hemichordates with both non-chordates and chordates
CO4	Have knowledge on Metamerism in Annelida, respiration and metamorphosis in arthropods, Social life of termites, Water vascular system in Echinoderms, nervous system in gastropods.

CC 3 - Practical
Non-Chordates II – Coelomates – Lab

After successfully completing this course, students will be able to:

CO1	Identify and classify invertebrates (Annelids to Echiniderms) by studying their external characters and prepare keys
CO2	Understand the internal organ systems of one non-chordate (*Periplaneta)* - Nervours system, Reproductive system (Male & female), Mouth parts & Salivary apparatus

CC 4 – Theory
Cell Biology

After successfully completing this course, students will be able to:

CO1	Have a knowledge about Ultra-structure and composition of Plasma membrane: Fluid mosaic model, Transport across membranes, Cell junctions and Desmosomes
CO2	Have a concept of the structure and functions of cytoskeleton, cytoplasmic organelles and the nucleus
CO3	Know the different aspects of cell cycle and its regulation, Concept of oncogenes and tumour suppressor genes and its relation to cancer
CO4	Understand Cell signalling transduction pathways; Types of signalling molecules and receptors : RTK & JAK/STAT and Apoptosis

CC 4 – Practical
Cell Biology – Lab

After successfully completing this course, students will be able to:

CO1	Prepare temporary stained squash preparation of onion/arum root tip to study various stages of mitosis, Prepare temporary stained squash of grasshopper testis to identify various stages of meiosis
CO2	Prepare a permanent slide to show the presence of Barr body in human female blood cells/cheek cells.
CO3	Prepare a permanent slide to demonstrate: a. DNA by Feulgen reaction b. Cell viability study by Trypan Blue staining

PART II: SEMESTER 3

CC5 – Theory
Chordata

After successfully completing this course, students will be able to:

CO1	Have a knowledge on general characteristics and classification of protochordates to mammals
CO2	Have a knowledge about Migration in fishes; Parental care in fishes; Swim bladder in fishes. Metamorphosis, Paedomorphosis, Parental care in Amphibia. Poison apparatus and Biting mechanism in Snake.
CO3	Have a knowledge about Exoskeleton and migration in Birds; Principles and aerodynamics of flight. Exoskeleton derivatives of mammals; Adaptive radiation in mammals with reference to locomotory appendages; Echolocation in Micro chiropterans

CC5 – Practical
Chordata – Lab

After successfully completing this course, students will be able to:

CO1	Identify and classify vertebrates (protochordates to mammals) by studying their external characters and prepare keys
CO2	Understand the internal organ systems of one chordate (*Tilapia)* - Dissection of brain and pituitary – *ex situ*, digestive and Urino-genital system of *Tilapia*,
CO3	Dissect Pecten from Fowl head to understand the mechanics of vision in birds
CO4	Know about the habit, habitat or behaviour of any one animal found in her local area to emphasize the importance of local biodiversity

CC6 – Theory
Animal Physiology: Controlling and Co-ordinating System

After successfully completing this course, students will be able to:

CO1	Have a concept of the structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue, bones and cartilages
CO2	Have an inner view into the Physiology of excretion, skeletal muscle contraction, Origin and propagation of nerve impulse and physiology of mammalian reproduction .

CO3	Have knowledge of the different endocrine and neuro- endocrine glands and their functions
CO4	Endocrine regulation of estrous and menstrual cycle.
CO5	Have a concept of Mechanism of Hormone action and the signal transduction pathways for Steroidal and Non- steroidal hormones

CC6 – Practical
Animal Physiology: Controlling and Co-ordinating System - Lab

After successfully completing this course, students will be able to:

CO1	Record cardiac and simple muscle twitch with electrical stimulation
CO2	Prepare temporary mounts of Squamous epithelium, Striated muscle fibres and nerve cells
CO3	Have a knowledge of Preparation of permanent slides mammalian (Goat/white rat) tissues by microtomy
CO4	Identify with characters T.S. of Mammalian Skin, Spinal cord, Pancreas, Testis, Ovary, Adrenal, Lung, pyloric stomach, cardiac stomach, Thyroid, small intestine and large intestine of mammal (white rat) from permanent slides

CC 7 – Theory
Fundamentals of Biochemistry

After successfully completing this course, students will be able to:

CO1	Have a concept of the Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis
CO2	Have a concept of the Structure and Significance of saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. Lipid metabolism
CO3	Have a concept of the Structure, Classification, General and Electro chemical properties of α-amino acids; Proteins Bonds stabilizing protein structure; Levels of organization; Protein metabolism
CO4	Have a knowledge of the Structure of nucleic acids; Nucleic Acid Metabolism: Catabolism of adenosine, Guanosine, cytosine and thymine.
CO5	Have a concept of the Nomenclature and classification of enzymes, Cofactors, Isozymes, Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver-Burk plot; Enzyme inhibition.
CO6	Have a knowledge of Oxidative Phosphorylation **,**Redox systems; Mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System

CC 7 – Practical
Fundamentals of Biochemistry – Lab

After successfully completing this course, students will be able to:

CO1	Qualitatively test for carbohydrates, proteins and lipids in a given sample
CO2	Qualitatively analyse Urea & Uric acid in a given sample

CO3	Differentially separate amino acids through Paper chromatography
CO4	Quantitatively estimate the water soluble proteins following Lowry's Method

PART II: SEMESTER 3
Skill Enhancement courses (SEC)

[In our college a student is offered ZOOA-SEC(A)-3-1 as part of syllabi]

SEC-1 Apiculture

After successfully completing this course, students will be able to:

CO1	Have a knowledge of *Apis* and Non-*Apis* Bee species and their identification. General Morphology of *Apis* Honey Bees. Social Organization of Bee Colony
CO2	Have a knowledge of an Apiary, artificial rearing of Bees, methods of honey extraction
CO3	Have a knowledge of Bee Diseases and Enemies, Control and Preventive measures
CO4	Have a concept of the Bee Economy i.e. Products of Apiculture Industry and its Uses
CO5	Have a concept of Entrepreneurship in Apiculture**,** Bee Keeping Industry – Recent Efforts, Modern Methods in employing artificial Beehives for cross- pollination in horticultural gardens

PART II: SEMESTER 4

CC 8 - Theory
Comparative Anatomy of Vertebrates

After successfully completing this course, students will be able to:

CO1	Have a knowledge of the Structure, function and derivatives of integument in amphibian, birds and mammals
CO2	Have a knowledge of Comparative anatomy of stomach and evolution of dentition in mammals in relation to food habits
CO3	Have a knowledge of the evolution of respiratory organs in fish, birds and mammals and evolution of heart and aortic arches in vertebrates
CO4	Have a knowledge of evolution of urino-genital ducts and kidneys in different vertebrate groups. Evolution of Nervous system and sense organs
CO5	Have a concept of axial and appendicular skeleton – limbs, girdles of pigeon; jaw suspension in mammals

CC 8 - Practical
Comparative Anatomy of Vertebrates - Lab

After successfully completing this course, students will be able to:

CO1	Identify placoid, cycloid and ctenoid scales through permanent slides/photographs
CO2	Identify with characters the limb bones, vertebrae, and girdles of toad, Pigeon, Guineapig and skull of Pigeon, one herbivore (Guineapig) and one carnivore (Dog)

CO3	Co-relate structure with function by comparative study of heart and brain in vertebrates

CC 9 - Theory
Animal Physiology: Life Sustaining Systems

After successfully completing this course, students will be able to:

CO1	Have an concept of the Structural organisation and function of gastro-intestinal tract; physiology of digestion, absorption of Carbohydrates, Lipids and Proteins in Human
CO2	Have an concept of Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it, respiratory pigments; Carbon monoxide poisoning
CO3	Have a knowledge of Structure and functions of haemoglobin; Blood clotting system; Haematopoiesis Blood groups, Coronary Circulation, Structure and working of myocardial fibres, Origin and conduction of cardiac impulses; Cardiac Cycle and cardiac output
CO4	Have a knowledge of Thermoregulation in extreme heat and cold conditions in mammals & Osmoregulation in aquatic vertebrates
CO5	Have a knowledge of Structure of Kidney, Mechanism of urine formation, Regulation of acid base balance

CC 9 - Practical
Animal Physiology: Life Sustaining Systems – Lab

After successfully completing this course, students will be able to:

CO1	Determine ABO Blood group
CO2	Estimate haemoglobin using Sahli's haemoglobinometer
CO3	Identify blood cells from human blood and from cockroach haemolymph
CO4	Prepare haemin crystals and haemochromogen crystals
CO5	Demonstrate blood pressure by digital meter

CC 10 - Theory
Immunology

After successfully completing this course, students will have knowledge on:

CO1	Cells and organs associated with immune system; Innate and adaptive immunity
CO2	Concept of Antigens, Antibody, Cytokines, adjuvants, Complement proteins and its activation, MAC formation
CO3	Humoral and cell mediated immunity, T-cell and B-cell, Macrophage, MHC, Cytokines and pathways of complement activation
CO4	Monoclonal antibody production, Immunoassay – ELISA, RIA
CO5	Various types of hypersensitivities, Gell and Coombs' classification
CO6	Various types of vaccines. Active & passive immunization (Artificial and natural).

CC 10 - Practical
Immunology – Lab

After successfully completing this course, students will be able to:

CO1	Identify lymphoid organs
CO2	Identify with characters T.S. of Bursa fabricius, spleen, thymus and lymph nodes
CO3	Perform ELISA

PART II: SEMESTER 4
Skill Enhancement courses (SEC)

[In our college a student is offered ZOOA-SEC(B)-4-1 as part of syllabi]

SEC-1.Aquarium Fish Keeping

After successfully completing this course, students will have knowledge on:

CO1	The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes
CO2	Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish
CO3	Use of live fish feed organisms. Preparation and composition of formulated fish feeds, Aquarium fish as larval predator
CO4	Live fish transport - Fish handling, packing and forwarding techniques.
CO5	General Aquarium maintenance – budget for setting up an Aquarium Fish Farm as a Cottage Industry

PART III: SEMESTER 5

CC 11- Theory
Ecology

After successfully completing this course, students will be able to:

CO1	Have a thorough idea on different types of ecosystem, concept of structure and function of ecosystem and relation between Community and ecosystem.
CO2	Have a basic idea on population attributes, population interactions and Population growth models
CO3	Correlate on Animal's space and resource use and Resource partitioning, Food chain and ecological pyramids
CO4	Know about Ecological succession, concept of Climax and have a brief idea on El nino, La nina and their consequences
CO5	Have a thorough knowledge on biodiversity and conservation and conservation strategies, Concept of corridor, advantages and problem of corridor.
CO6	Concept of wildlife, wildlife heritage of India, IUCN categories, Protected area and man-animal conflct, conservation strategies for Tiger, Olive ridley turtles, White Rumped Vulture.

CC 11- Practical
Ecology – Lab

After successfully completing this course, students will be able to:

CO1	Determine the population density in a natural/hypothetical community by quadrate method and calculate of Shannon-Weiner diversity index for the same community
CO2	Study of an aquatic ecosystem by identifying Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content), Chemical Oxygen Demand and free CO_2
CO3	Assess the biodiversity of any Ecosystem, assessment of man-wildlife conflict, eco-tone, edge effect, eco-sensitivity, economics of the native inhabitants, logging and lopping effect, conservation process practiced etc. and prepare a field report

CC 12 - Theory
Principle of Genetics

After successfully completing this course, students will have knowledge on:

CO1	Principles of inheritance , Mendelian laws of inheritance and its exceptions, Cis-trans test for allelism, Penetrance & Expressivity of alles
CO2	Linkage, Crossing Over and Linkage Mapping, Sex linkage in *Drosophila* (White eye locus) & Human (Haemophilia).
CO3	Types of gene mutations and chromosomal aberrations and its effects, Molecular basis of mutations in relation to UV light and chemical mutagens. Mutation detection in*Drosophila* by attached X method. Biochemical mutation detection in *Neurospora*.
CO4	Mechanisms of sex determination in *Drosophila* and in man; Dosage compensation in *Drosophila* & Human
CO5	Extra-chromosomal and maternal Inheritance, Determination of genetic fine structure by complementation test
CO6	Transposable Genetic Elements in bacteria maize, drosophila and humans

CC 12 - Practical
Principle of Genetics - Lab

After successfully completing this course, students will be able to:

CO1	Perform Chi-square analyses for testing genetic ratio.
CO2	Identify chromosomal aberration in *Drosophila* and man from photograph
CO3	Perform Pedigree analysis of some inherited traits in animals

PART III: SEMESTER 5
Discipline Specific Elective

[In our college a student is offered ZOOA-DSE(A)-1 as part of syllabi]

DSE (A) - 1 Parasitology -Theory

After successfully completing this course, students will have knowledge on:

CO1	Parasite, Parasitoid and Vectors, Host- parasite relationship
CO2	Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of some protozoans - *Giardia intestinalis*, *Trypanosoma gambiense*, *Leishmania donovani*
CO3	Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of some helminths - *Schistosoma haematobium, Taenia solium*
CO4	Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and

	Treatment of some nematodes - *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Wuchereria bancrofti*, Nematode plant interaction.
CO5	Biology, importance and control of parasitic arthropods and parasitoids
CO6	Parasitic Vertebrates like Cookicutter Shark, Hood Mocking bird, Vampire bats

DSE (A) - 1
Parasitology – Practical

After successfully completing this course, students will be able to:

CO1	Identify the life stages of some protozoan parasites - *Giardia intestinalis*, *Trypanosoma gambiense, Leishmania donovani,Plasmodium vivax, Plasmodium falciparum*
CO2	Identify the life stages of some helminth & nematode parasites - *Schistosoma haematobium, Taenia solium, Ancylostoma duodenale*
CO3	Identify monogenea from the gills of fresh/marine fish
CO4	Identify nematode/cestode parasites from the intestines of Poultry bird & Goat.
CO5	Have a brief idea about parasitic vertebrates and prepare a report on it.

Discipline Specific Elective

[In our college a student is offered ZOOA-DSE(B)-1 as part of syllabi]

DSE (B) - 1 Endocrinology - Theory

After successfully completing this course, students will have:

CO1	A general idea of Endocrine systems, Transport of Hormones, Neuro-secretions and Neuro-hormones
CO2	Have an understanding of the Hypothalamo-Hypophyseal-Gonadal Axis, structure of pituitary gland, hormones and their functions
CO3	Have a knowledge of the endocrine glands, their functions and disorders caused by their hypo or hypersecretions
CO4	Have a concept of Mechanism of action of steroidal, non-steroidal hormones, and their regulation Calcium and Glucose homeostasis in mammals. Bioassays of hormones
CO5	Have a knowledge of Calcium and Glucose homeostasis in mammals. Bioassays of hormones. Have a knowledge of Estrous cycle in rat and menstrual cycle in human.
CO6	Have a concept of some non- mammalian vertebrate hormones

DSE (B) – 1
Endocrinology – Practical

After successfully completing this course, students will be able to:

CO1	Dissect and display Endocrine glands in laboratory bred rat
CO2	Identify with characters T.S. of all the endocrine glands
CO3	Have a knowledge of preparation of permanent slides of endocrine glands by microtomy
CO4	Perform H-E staining of Histological slides

PART III: SEMESTER 6

CC 13
Developmental Biology – Theory

After successfully completing this course, students will have:

CO1	Have a concept of Gametogenesis, Fertilization, cleavage, Blatulation, Fate map construction, Gastrulation, Embryonic induction and organizers
CO2	Have a knowledge of Extra-embryonic membranes in Chick, Implantation of embryo in humans and Placentation
CO3	Have a concept of molecular Induction in Brain and Eye development and their formation
CO4	Have a knowledge of *In vitro* fertilization (IVF), Stem cell, Applications of stem cell therapy in bone marrow transplantation and cartilage regeneration

Developmental Biology – Practical

After successfully completing this course, students will be able to:

CO1	Identify the different developmental stages of chick embryo
CO2	Identify the developmental stages and life cycle of *Drosophila*
CO3	Identify the different sections of placenta
CO4	Identify the larvae of Phylum Annelida, Arthropoda, Mollusca and Echinodermata

CC 14
Evolutionary Biology – Theory

After successfully completing this course, students will have:

CO1	Have a knowledge of chemical basis of Origin of Life, Lamarkism, Darwinism and Neo Darwinism
CO2	Have a knowledge of Geological time scale, age determination by Carbon dating, Evolution of horse
CO3	Have a concept of Natural selection, Synthetic theory, Hardy-Weinberg equilibrium, Genetic drift, founder effect and population bottleneck, Bathymetric and discontinuous distribution, Barriers and dispersals
CO4	Have a knowledge of Speciation, Adaptive radiation, Origin and evolution of man
CO5	Have a concept of back ground and mass extinctions, K-T extinction
CO6	Have a knowledge of construction and interpretation of Phylogenetic tree using parsimony, convergent and divergent evolution.

Evolutionary Biology – Practical

After successfully completing this course, students will be able to:

CO1	Identify and interprete fossils from models/ pictures
CO2	A brief idea of homology and analogy in the vertebrates
CO3	Construct & interprete Phylogenetic tree using parsimony, Construct dendrogram following principles of phenetics & cladistics from a data table.

PART III: SEMESTER 6

DSE(A) 1
Animal Cell Biotechnology- Theory

After successfully completing this course, students will have knowledge on :

CO1	Concept and scope of Biotechnology and Techniques used in Gene manipulation
CO2	Basic techniques in animal cell culture and organ culture Stem cells, Cryopreservation of cultures.
CO3	A thorough knowledge of different techniques required in recombinant DNA technology
CO4	Different types of Fermentation and techniques for Downstream Processing: Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization.
CO5	Applications of Hybridoma technology in health

Animal Cell Biotechnology- Practical

After successfully completing this course, students will have knowledge on:

CO1	Packing and sterilization of glass and plastic wares for cell culture and Preparation of culture media
CO2	Preparation of genomic DNA from E. coli/animals/ human.
CO3	Plasmid DNA isolation (pUC 18/19) and DNA quantitation using agarose gel electrophoresis (by using lambda DNA as standard)
CO4	Techniques commonly used: Western Blot, Southern Hybridization, DNA Fingerprinting, PCR, DNA Microarrays

DSE (A)2
Animal Biotechnology- Theory

After successfully completing this course, students will have knowledge on:

CO1	Organization of *E.coli* and *Drosophila* genome.
CO2	Recombinant DNA technology, Molecular Techniques used in Gene manipulation
CO3	Production of cloned and transgenic animals, Applications of transgenic animals
CO4	Animal cell culture techniques, Production of Genetically modified economically important animals
CO5	Molecular diagnosis of genetic diseases and Gene Therapy

Animal Biotechnology- Practical

After successfully completing this course, students will be able to:

CO1	Isolate Genomic DNA from *E. coli* and Plasmid DNA isolation (pUC 18/19) from *E. coli*
CO2	Have aknowledge of modern molecular biological techniques - Southern Blotting, Northern Blotting, Western Blotting, PCR, DNA fingerprinting
CO3	Prepare a Project report on animal cloning , its application & ethical Issues.

DSE(B)1.
Animal Behaviour and Chronobiology - Theory

After successfully completing this course, students will be able to have knowledge on:

CO1	Patterns of Behaviour found in animals
CO2	Social organisation in termites; Communication (dance & pheromones in Bees) Social behaviour: Altruism Cooperation and Selfishness Sexual Behaviour: Sexual dimorphism, Mate choice in peacock, Kinship theory, parent offspring conflict and sibling rivalry
CO3	Types and characteristics of biological rhythms Biological clock and its adaptive significance, circa-annual rhythym in bird migration

Animal Behaviour and Chronobiology - Practical

After successfully completing this course, students will be able to have knowledge on:

CO1	Nests and nesting habits of the birds and social insects.
CO2	Behavioural responses of wood lice to dry and humid conditions
CO3	Geotaxis behaviour in earthworm.
CO4	Phototaxis behaviour in insect larvae
CO5	Study of circadian functions in humans (daily eating, sleep and temperature patterns).
CO6	Assess the biodiversity of any ecosystem, assessment of behaviourial activities of any animal in its natural ecosystem and prepare a field report

DSE(B)2
Fish and Fisheries - Theory

After successfully completing this course, students will be able to have knowledge on:

CO1	Feeding habit, habitat and manner of reproduction. Classification of fish
CO2	Morphology and Physiology of fishes
CO3	Inland Fisheries; Marine Fisheries; Fishing crafts and Gears; Depletion of fisheries resources; Application of remote sensing and GIS in fisheries; Fisheries law and regulations
CO4	Different types of aquaculture practiced, Fish diseases, Preservation and processing of harvested fish, Fishery by-products
CO5	Transgenic fish, Zebra fish as a model organism in research

Fish and Fisheries - Practical

After successfully completing this course, students will be able to:

CO1	Perform analysis of morphometric and meristic characters of fishes
CO2	Identify different fish genera
CO3	Identify different types of scales
CO4	Have a knowledge of crafts and gears used in Fisheries
CO5	Determine Water quality criteria for Aquaculture: Assessment of pH, alkalinity, Salinity.
CO6	Have a knowledge of air breathing organs in *Channa, Heteropneustes, Anabas* and *Clarias*
CO7	Prepare a Project Report after a visit to any fish farm/ pisciculture unit/Zebra fish rearing Lab.

DEPARTMENT OF ZOOLOGY
PROGRAM OUTCOME, PROGRAM SPECIFIC OUTCOME AND COURSE OUTCOME
2018-19

M.Sc. IN ZOOLOGY

Model Reference: Syllabus for M.Sc. Zoology (Semester) Course, University of Calcutta

- The Course entitled M.Sc. in Zoology was started in 2016 and the first batch of students appeared for their final fourth semester conducted successfully in June 2018 in the Post Graduate Department of Zoology. The second batch of PG students appeared for their Semester 1 examination in December, 2017 and Semester 2 in June, 2018. Although with financial autonomy granted by the affiliating University, i.e. Calcutta University, the syllabus followed was totally as that followed by Calcutta University.
- The CBCS course under the exclusive control of the University of Calcutta came into effect from August 2018. The third batch of PG students who are following the CBCS Course introduced for the first time have just completed their Semester IV examination. Hence it is still premature to analyse the impact of the projected POs & PSOs in the CBCS syllabus designed by the University of Calcutta.

PROGRAM OUTCOME

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	To provide a sound knowledge and understanding of basic and applied Zoology
PO B	To prepare the students for a successful career in teaching, wildlife projects, industries, etc. and also to motivate them for higher education and to take up research as a career
PO C	Ability to use modern techniques and handle sophisticated instruments for experimental work; apply current software for data analysis
PO D	To develop the ability to communicate and comprehend; documentation and effective writing of laboratory notebooks, field reports and environmental audit reports, prepare effective presentations, and give and receive clear instructions
PO E	To develop individual and team work by functioning effectively as an individual or as a member in a group in laboratory classes
PO F	To develop an opportunity to work in interdisciplinary groups or areas
PO G	To inculcate scientific temperament in the young minds and outside the scientific community
PO H	Apply the knowledge and understanding of Zoology to one's own life and work
PO I	Develop leadership and managerial skills and understanding the need for lifelong learning to be a competent professional

PROGRAM SPECIFIC OUTCOME

Programme Specific Outcomes Nos	Programme Specific Outcomes (PSO)
PSO 1	Understand the nature and basic concepts of Cell biology, Genetics, Taxonomy, Physiology, Biochemistry, Microbiology, Immunology, Biotechnology, Molecular Biology, Developmental Biology, Ecology, Applied Zoology, etc.
PSO 2	Understand the complex evolutionary processes and behaviour of animals
PSO 3	Understand biodiversity and protection of endangered species, environmental conservation processes and its importance, pollution control
PSO 4	Gain knowledge of Agro based Small Scale industries like sericulture, apiculture, pearl culture, fish farming, vermicompost preparation, etc.
PSO 5	Understand the basic concepts of genetics and its importance in human health and medicine
PSO 6	To be acquainted with good laboratory practices and safety measures, understand and apply ethical principles and commit to professional ethics and responsibilities

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
SEMESTER 1	Paper ZCT 101 – Non chordate Biology	√	√		√			√	√	√
	Paper ZCT 102 - Ecological theories	√	√		√		√	√	√	√
	Paper ZCT 103 – Cell Biology	√	√	√			√	√	√	√
	Paper ZCT 104 - Genetics	√	√	√			√	√	√	√
	Paper ZCT 105 - Parasitology	√	√				√	√	√	√
	Paper ZCT 106 – Insect Biology	√	√				√	√	√	√
	Paper ZCP 107 - Laboratory course for core subjects	√	√	√	√	√	√	√	√	√
SEMESTER 2	Paper ZCT 208 – Chordate Biology	√	√		√			√	√	√
	Paper ZCT 209 – Developmental Biology	√	√		√			√	√	√

	Paper ZCT 210 - Immunobiology	√	√	√	√		√	√	√	√
	Paper ZCT 211 - Biochemistry and Genetic Engineering	√	√	√	√		√	√	√	√
	Paper ZCT 212 - Endocrinology	√	√	√			√	√	√	√
	Paper ZCT 213 – Aquatic Biology	√	√	√			√	√	√	√
	Paper ZCP 214 - Laboratory course for core subjects	√	√	√	√	√	√	√	√	√
SEMESTER 3	Paper ZCT 315 - Taxonomy and Biostatistics	√	√		√		√	√	√	√
	Paper ZCT 316 - Animal Behaviour and Wildlife Biology	√	√		√		√	√	√	√
	Paper ZCP 317 - Laboratory course for core course	√	√	√	√	√	√	√	√	√
	Paper ZET 322 - Elective I Theory (Biodiversity and Ecosystem function)	√	√		√		√	√	√	√
	Paper ZET 330 - Elective I Theory (Reproductive Endocrinology)	√	√		√		√	√	√	√
SEMESTER 4	Paper ZCT 432 – Applied Ecology	√	√		√		√	√	√	√
	Paper ZCT 433 - Evolution	√	√		√		√	√	√	√
	Paper ZCT 434 – Comparative Animal physiology	√	√	√	√		√	√	√	√
	Paper ZCP 435 - Laboratory course for Core Subjects	√	√	√	√	√	√	√	√	√
	Paper ZLI 440 &	√	√	√	√	√	√	√	√	√

	448 – Lab Internship									
	Paper ZCP 450 – Grand Viva	√	√	√	√			√	√	√

TABLE 2

Mapping of PO & PSO for M.Sc. CBCS Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	Programme Outcomes (PO)								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
PSO 1	√	√	√	√	√	√	√	√	√
PSO 2	√	√		√	√	√	√	√	√
PSO 3	√	√		√	√	√	√	√	
PSO 4	√	√	√	√	√	√	√	√	√
PSO 5	√	√	√			√	√	√	
PSO 6	√	√	√	√	√	√	√	√	√

COURSE OUTCOME

SEMESTER – I

Paper ZCT 101 - Non-chordate Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Evolution of metazoans, origin, radiation and extinction of invertebrate groups. Evolution of polarity and early organizer concept
CO2	Types of invertebrate feeding
CO3	Biological and medicinal importance of sponges
CO4	Biology of Entoprocta and Cycliophora
CO5	Mechanics of invertebrate movement/locomotion; muscular activity and skeletal system; invertebrate swimming and flight
CO6	Factors influencing respiration (body and size, activity, feeding, temperature, oxygen tension and salinity)
CO7	Invertebrate defense against predators and parasites
CO8	Regulation of reproductive process- reproductive cycle, biorhythmicity
CO9	Organization of nervous system: nervous system, nerve net, central and peripheral nervous system, invertebrate brain
CO10	Regeneration in Cnidaria and Annelida
CO11	Thermoregulation and Osmoregulation in different invertebrate groups

Paper ZCT 102 - Ecological theories

After successfully completing this course, students will be able to have knowledge on:

CO1	Population Ecology including Population growth models (Beverton Holt, Ricker, Time lag); Life history strategies and their evolution; Meta-population - Levin's model, extinction risk.
CO2	Ecological Communities including Species abundance models; Niche and competition theories (Lotka Volterra model, Isoclines, Niche prediction); Elements of Landscape ecology; Food web models and network; Biodiversity and ecosystem function; Prey-Predator Models
CO3	Evolutionary and Behavioral Ecology which included Ecological specialization and generalization; Parent – offspring conflict; Evolution of sex and sex ratio; Mating systems with special reference to birds and mammals; Communication; Foraging

Paper ZCT 103 - Cell Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Plasma membrane- structure and functional inter-relationships including membrane assembly
CO2	Structure and function of animal tissues
CO3	The cytoskeleton, cellular transport, extracellular matrix
CO4	Cell signalling and cell-cell interaction including cell surface and intracellular receptors; signalling pathways and cross talk mechanisms
CO5	Cell death mechanisms including autophagy, apoptosis and anoikis
CO6	Staining and dyes in identification of specific tissues. Stains- definition, physical & chemical classification, nomenclature, mordants, metachromasia
CO7	Tools and techniques in cell biology

Paper ZCT 104 - Genetics

After successfully completing this course, students will be able to have knowledge on:

CO1	Chromatin Dynamics: Chromatin remodeling; Replicative nucleosomal assembly; nucleosome positioning at functional promoter. Molecular nature of functional status of chromatin; chromatin silencing & positing effect variegation. Histone code, reader-writer complex
CO2	DNA replication and regulation including enzymology of eukaryotic replication and gene amplification and role of Non-coding RNA in prokaryotic and eukaryotic DNA replication.
CO3	Regulation of gene expression including Transcription in eukarytotes: Initiation, elongation & termination; Epigenetic regulation: Dosage compensation in Mammals and Drosophila; Genetic imprinting: Mechanism and Model; Catalytic & small RNAs; Gene silencing.
CO4	Translation & Post Translational events including Translation in eukaryotes: Initiation, Elongation and termination; Protein splicing, chaperones and protein folding; Post translational mRNA decay.
CO5	Recombination & repair including Recombination in eukaryotes; Recombination types; Enzymology of human meiotic recombination; Molecular anatomy of synaptonemal complex; Enzymes involved in DNA repair mechanisms.
CO6	Transposable Genetic Element including Ac-Ds element in Maize, IS element in bacteria, Composite transposon, Retrotransposon; P-element in Drosophila, Hybrid

	dysgenesis and role of piRNA in transposon silencing; Role of transposable element in evolution and genome modification.
CO7	Microbial Genetics including Conjugation, Transduction, Regulation of Lytic and Lysogenic cycle.
CO8	Somatic cell genetics including Cell fusion, heterokaryon selection & hybridoma technology and Chromosome mapping.

Paper ZCT 105 - Parasitology

After successfully completing this course, students will be able to have knowledge on:

CO1	Human clinical and veterinary parasitology - detection, diagnosis, prophylaxis, treatment, and pharmacology (emergent parasites)
CO2	Community medicine
CO3	Host parasite interaction - immunological nuances in vertebrates and invertebrates and epidemiological surveillance tools.
CO4	Vector biology with special reference to Malaria and Kala-azar.
CO5	Genome organization in *Plasmodium*
CO6	Molecular basis of antigenic variation in *Plasmodium*

Paper ZCP 106 - Insect Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Food and digestion, feeding potential of insects in response to food availability
CO2	Excretory mechanism of insects with special reference to Cryptonephridial mechanism
CO3	Tracheal and plastron respiration of insects
CO4	Insect immune defense
CO5	Metamorphosis, diapauses and their interrelationship and regulation
CO6	Atypical modes of reproduction
CO7	Stridulation and its biological significance
CO8	Bioluminescence

Paper ZCP 107 - Laboratory course for Core Subjects

After successfully completing this course, students will be able to have knowledge on:

CO1	Special structures: (i) Stomatogastric nervous system in cockroach (ii) Poison gland of Ant/Spider (iii) Mounting of mouth parts of mosquito-identification of genera & sex (iv) Haltere in housefly, mouth parts of housefly.
CO2	Comparative anatomy of Excretion & Nervous systems in Annelid, Insect and Molluscan models.
CO3	Analysis of aquatic habitat and community.
CO4	Analysis of terrestrial habitat and community
CO5	*Drosophila* genetic crosses, Induction of mutation in *Drosophila* by P-M Mutagenesis, Preparation of polytene chromosome, Karyotyping
CO6	DNA isolation and Agarose Gel Electrophoresis
CO7	Restriction digestion
CO8	Identification of mammalian tissue sections.
CO9	Tissue fixation, microtomy and double staining of tissue sections.

SEMESTER 2

Paper ZCT 208 – Chordate Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Protochordata including fine structure of notochord in Amphioxus and modern interpretation of origin of early chordata.
CO2	Cell association and glandular system in the integumentary system
CO3	Skeletal system - Origin of jaw and modification of jaw bones and types; functional and evolutionary significance; Jaw kinetics in relation to feeding.
CO4	Circulation - Heart and circulation in fetal and neonatal mammal;Evolution of portal system.
CO5	Nervous system & Sense organ including sensory receptors and classification; organ of olfaction and taste.
CO6	Structural Adaptation - Structural elements of body and their properties; Mechanics of support and movement; Swimming adaptation; Cursorial adaptation; Flying mechanism.

Paper ZCT 209 - Developmental Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Principles of Developmental Biology
CO2	Metamorphosis and organogenesis in model organisms
CO3	Regenerative Biology
CO4	Environment and Development

Paper ZCT 210 - Immunology

After successfully completing this course, students will be able to have knowledge on:

CO1	Phylogeny of Immunity
CO2	Different aspects of Innate Immunity
CO3	Antigens Capture and Presentation
CO4	Antigen Recognition
CO5	Different aspects of Cell Mediated Immunity
CO6	Different aspects of Humoral Immunity

Paper ZCT 211 - Biochemistry and Genetic Engineering

After successfully completing this course, students will be able to have knowledge on:

CO1	Concept of protein, amino acids, carbohydrate and lipid including their metabolism; names of simple precursors of some important bioactive molecules such as dopamine, melanine, porphyrin, cholesterol, purine & pyrimidines. Some important catabolites such as billirubin, uric acid etc; Metabolic disorders.
CO2	Enzymes: classification, kinetics, examples of inhibitions & inhibitors; modulations
CO3	Concept of Bioenergetics
CO4	Vitamins and minerals: use of vitamines as coenzymes with the relevant reaction involved and deficiencies.
CO5	Chemistry of free radicals and antioxidants.
CO6	Different details of Recombinant DNA technology
CO7	Basic concepts of Genomics, Proteomics & Bioinformatics

CO8	Basic concepts of Gene therapy & Pharmacogenomics
CO9	Molecular techniques like Polymerase chain reaction (PCR), RT-PCR, Pulse Field Gel Electrophoresis, Site-directed mutagenesis, Gel retardation assay, RNAse protection assay, DNA fingerprinting, FISH, Southern, Northern and Western blot technique.

Paper ZCT 212 - Endocrinology

After successfully completing this course, students will be able to have knowledge on:

CO1	Pheromones: Classification, chemical nature, structure, functions, relevance in applied fields, clinical applications
CO2	GI tract hormones: Source, composition and functions
CO3	Thymic hormones and cell immunity
CO4	Pineal gland structure, biosynthesis of melatonin, diurnal variations of pineal gland functions
CO5	Hormones and human health: Stress, metabolic and reproductive disorders (Pituitary, Pancreas, Thyroid, Testis, Ovary) - molecular basis and therapeutics.

Paper ZCT 213 - Aquatic Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Deep Sea Environment and Biological adaptations of Aquatic biota. Hydrothermal vent and life processes. Molecular mechanism of adaptation to salinity in euryhaline and stenohaline species in coastal and intertidal ecosystem.
CO2	Chemical cues for orientation and navigation of aquatic organisms in response to emergent sensory requirements in complex aquatic environment.
CO3	Respiration and energy yield as survival strategies in fauna inhabiting extremities of aquatic environments
CO4	Molecular and integrative physiology of reproduction and larval recruitment of aquatic biota

Paper ZCP 214 - Laboratory course for Core Subjects

After successfully completing this course, students will be able to have knowledge on:

CO1	Morphometric analyses of different fish specimen and interpretation of food habit and respiratory efficiency. Collection of different swim bladder from different fish specimen (collected from market) and comparative study on functional efficiency of swim bladders.
CO2	Study of adaptive features and interpretation of significance from morphology of preserved specimen.
CO3	Determination of glucose in different patho-physiological condition and Estimation of total protein from tissues of animal model.
CO4	DNA isolation and agarose gel electrophoresis;Thin layer chromatography
CO5	Processing and double staining of different stages of estrous cycle of rats; Identification of endocrine gland sections
CO6	Identification of parasitic forms.
CO7	Dissection and identification of histological slides of spleen and thymus. Immunization Protocol Demonstration of Thioglycolate induced peritonitis (cell infiltration and inflammatory exudates). Identification and demonstration of Primary and secondary lymphoid organ Haemagglutination

CO8	ELISA method and Immunofluorescence

SEMESTER 3

Paper ZCT 315 - Taxonomy & Biostatistics

After successfully completing this course, students will be able to have knowledge on:

CO1	Concept of characters and character states
CO2	Concept of taxa and species
CO3	Approaches in classification – Cladistics, Phenetics and DNA Barcoding
CO4	Trends in Phylogenetic reconstruction
CO5	Basic Concepts of Descriptive Statistics
CO6	Basic Concepts of Sampling and Analysis

Paper ZCT 316 - Animal Behavior and Wildlife Biology

After successfully completing this course, students will be able to have knowledge on:

CO1	Genes and Behaviour
CO2	Different aspects of Cooperation and conflict
CO3	Foraging and Aggression
CO4	Wildlife habitat ecology and Protected area concept
CO5	Conservation biology of important wild animals
CO6	Basic Concept of Wildlife Biology and Wildlife conservation Indian perspective
CO7	Wildlife sampling; Peoples' participation in wildlife activities

Paper ZCP 317 - Laboratory course for Core Subjects

After successfully completing this course, students will be able to have knowledge on:

CO1	Developing habitat description, mapping and elevation and description of wildlife populations - Habitat structure description methods; GPS use, plant identification; Introduction to radiotelemetry; Larger mammal population estimation techniques
CO2	Learning operations for estimation of wildlife populations - Bird / butterfly sampling; Small mammal trapping; Population estimation using Mark-recapture method, Transects, Reptile and amphibian sampling.

Paper ZET 322 - Elective I (Biodiversity and Ecosystem Functioning)

After successfully completing this course, students will be able to have knowledge on:

CO1	Biodiversity Monitoring a. Measuring global biodiversity and its decline with special reference to mammals, birds, herpetofauna, fish and insects. b. Local and regional biodiversity-niche assembly theories, Unified Neutral theory c. Threats to species diversity: i. Habitat loss, Habitat fragmentation and species extinction ii. Endemism and biodiversity iii. Population bottleneck, Genetic drift, inbreeding depression iv. Risks to biodiversity extinction, Extinction vortex
CO2	Biodiversity and Ecosystem function a. Theories on relation between biodiversity and ecosystem function - Species

	complementarity, Sampling effect, Redundancy b. Decline of global biodiversity and loss of ecosystem function. c. Functional diversity and ecosystem functioning. d. Insurance Hypothesis: The effect of habitat fragmentation and dispersal on ecosystem functioning. e. Biodiversity and stability in soil ecosystem: pattern processes and the effect of disturbance. f. Global pollinator loss and their effect on crop production and non-crop plant reproduction. g. Multi-trophic dynamics and ecosystem processes. h. The economics of biodiversity and ecosystem function.
CO3	Landscape Ecology: a. Theories in landscape ecology. b. Scale and landscape c. Processes in the landscape d. Methods in landscape ecology

Paper ZET 330 - Elective I Theory (Reproductive Endocrinology)

After successfully completing this course, students will be able to have knowledge on:

CO1	Evolution of gonads: phylogeny and ontogeny of testis and ovary.
CO2	Sex determination and sex differentiation: from genes to gender (Fish and Human).
CO3	Female reproductive system: Hormonal regulation of ovulation, gestation, parturition and lactation.
CO4	Male reproductive system: Hormonal regulation of spermatogenesis
CO5	Prostaglandins: Source, chemical nature, structure, functions, physiological significance and clinical implications.
CO6	Clinical uses of steroid receptors and defects of receptors.
CO7	Endocrinology of photosexual activity: Extra-retinal photoreceptors, photorefractoriness, role of melatonin in reproduction (Model system – Fish).
CO8	Endocrine disruption of reproduction: (Model system – Fish).

SEMESTER 4

Paper ZCT 432 - Applied Ecology

After successfully completing this course, students will be able to have knowledge on:

CO1	Ecology of invasive species
CO2	Bioremediation and environmental biotechnology
CO3	Ecosystem services, biodiversity and ecological economics
CO4	Biological control-theory and application
CO5	Harvesting populations- theory and applications
CO6	Ecological restoration including succession

Paper ZCT 433 - Evolution

After successfully completing this course, students will be able to have knowledge on:

CO1	Basic concepts of Natural Selection and Adaptation
CO2	Different aspects of Evolutionary Process
CO3	Gene Frequencies in Population
CO4	Patterns and trends in evolution
CO5	Concept of Species and Speciation

Paper ZCT 434 - Comparative Animal Physiology

After successfully completing this course, students will be able to have knowledge on:

CO1	Principles of animal physiology :
CO2	Physiological homeostasis:
CO3	Thermal physiology
CO4	Physiology of excretion
CO5	Physiology of Circulation and Respiration
CO6	Physiology of behaviour

Paper ZCP 435 - Laboratory course for Core Subjects

After successfully completing this course, students will be able to have knowledge on:

CO1	Trait analyses of an invasive species
CO2	Pollen transport by any common insect pollinator
CO3	Water quality assessment for determination of trophic state of a pond
CO4	Construction of phylogenetic tree from supplied data
CO5	Enzymatic Method for Determining Amylase Activity (Comparative)

Paper ZLI 440 & 448 – Lab Internship (Elective)

After successfully completing this course, students will be able to have knowledge on:

CO1	Presenting in a Seminar
CO2	Submitting a Dissertation and review work
CO3	Conducting a scientific project

Department of Microbiology

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Microbiology (Honours)

(CBCS)

The Programme Outcomes (PO) of B.Sc. Honours Microbiology Curriculum:

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	To inculcate into the students, the holistic approach not only to the study of the subject, but also to any situation in life in the long run and to provide strong foundation in interdisciplinary approach
PO B	To gather strong, basic knowledge and understanding of the microbiological concepts to support diversification in applied field of microbiology such as biochemical and biomedical, industrial, environment, biotechnology, genetics, agriculture, food etc
PO C	To develop good laboratory skills and a zeal to address a problem from a scientific viewpoint
PO D	To develop excellent communication skills both in written as well as spoken language for developing expertise in good power of articulation while pursuing higher studies , research and industrial exposure.
PO E	To develop the spirit of teamwork, learn to harbour a collaborative approach in workplace and the ability to uphold integrity in work
PO F	To demonstrate key practical skills/ competencies in working with microbes for study and use in the lab as well as outside including the use of good microbiological practices.
PO G	To acquire competence to use microbiology knowledge and skills to analyse problems,to develop the skill of biological data handling as well as statistical analysis of the data
PO H	To become familiar with latest, advanced tools, sophisticated instruments and modern techniques of microbiology and learn the scope for their justified application.
PO I	To develop research approaches and aptitudes to meet the scientific gaps in microbiology and allied interdisciplinary or multidisciplinary fields.
PO J	To set career and professional goals based on a clear outlook of the situation and proper career planning process in higher education, as Academician, Industry professionals and environmental activist.
PO K	To ignite young minds to think innovatively and nurture scientific temper as anoutcome of attending several awareness programmes, scientific lectures and interactive sessions

Programme	Programme Specific Outcomes (PSO)

Specific Outcomes Nos	
PSO 1	Explain the fundamental concepts, core theories, methods and practices in different branches of Microbiology
PSO 2	Identify the microorganisms, classify them on the basis of their morphological characteristics and the relation between them and the environment
PSO 3	Demonstrate a rational understanding of the diversity of microorganisms, structure, functions, their role in biosphere, bioinformatics and biostatistics
PSO 4	Apply the tools, technologies and scientific methods for laboratory and conventional investigations safely and formulate valid conclusions based on the results in the field of Microbiology and its associated areas
PSO 5	Describe the role of microbes in human, food and dairy technology, agriculture, process of heritable information in microorganisms and forming new genetic combinations through recombinant DNA
PSO 6	Recognize biosafety measures, intellectual property rights and explore career related options in the field of Microbiology
PSO 7	Employ their knowledge of various structural and enzymatic properties of microbes and fermentation processes in developing environment friendly products or processes

Mapping of PO & PSO for Microbiology (Honours) Syllabus (CBCS) of University of Calcutta

Programme Specific Outcomes (PSO) Nos	Programme Outcomes (PO)										
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
PSO 1	√	√		√	√		√		√	√	√
PSO 2	√	√		√	√	√				√	√
PSO 3	√	√		√	√	√	√		√		√
PSO 4		√	√		√	√	√	√	√		√
PSO 5		√	√	√	√	√		√			√
PSO 6		√		√					√	√	√
PSO 7		√	√		√	√	√	√		√	√

Programme Outcome mapping for Partial Semester wise CBCS Courses in Microbiology (Honours) under University of Calcutta

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)										
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Sem1 6 months	**CC1** Introduction to Microbiology and Microbial Diversity (Theory+Practical)	√		√		√	√					
	CC2 Bacteriology (Theory + Practical)		√	√		√	√	√	√			
SemII 6 months	**CC3** Biochemistry (Theory + Practical)	√		√		√			√	√		√
	CC4 Cell Biology (Theory + Practical)		√	√		√	√		√	√		√

TABLE II

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)										
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
SemIII 6 months	**CC5** Virology (Theory + Practical)		√	√		√	√		√	√	√	√
	CC6 Microbial Physiology and Metabolism (Theory + Practical)		√	√		√	√		√	√	√	√
	CC7 Molecular Biology (Theory + Practical)	√		√		√	√		√	√	√	√
	SECA1 Microbial Quality Control in Food and Pharmaceutical Industries		√						√	√	√	√
	SECA2 Biofertilizers and Biopesticides		√								√	√

SemIV 6 months	**CC-8:** Microbial Genetics (Theory + Practical)		√	√	√		√		√		√	
	CC-9: Environmental Microbiology (Theory + Practical)	√	√	√		√	√	√			√	√
	CC-10: Recombinant DNA Technology (Theory + Practical)		√	√				√	√	√	√	√
	SEC-B 1. Food Fermentation Techniques		√							√	√	
	SEC-B 2 Microbiological Analysis Of Air And Water		√				√			√	√	

TABLE III

COURSE DURATION	**COURSE DETAIL**	**PROGRAMME OUTCOME (PO)**										
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
SemV 6 months	**CC-11:** Food And Dairy Microbiology (Theory + Practical)		√	√			√		√		√	√
	CC-12: Industrial Microbiology (Theory + Practical)	√	√	√			√		√			
	DSE-A 1 Microbial Biotechnology (Theory + Practical)	√	√	√		√	√			√	√	√
	DSE-A 2 Advances In Microbiology (Theory + Practical)	√	√	√			√	√	√			√
	DSE-B 1 Inheritance Biology (Theory + Practical)	√	√	√				√		√	√	
	DSE-B 2 Microbes In Sustainable Agriculture And Development (Theory + Practical)	√	√	√			√		√	√	√	
SemVI 6 months	**CC-13**: Immunology (Theory + Practical)	√			√			√	√	√	√	√
	CC-14: Medical Microbiology (Theory + Practical)	√		√			√	√	√			√

	DSE-A 3 Plant Pathology (Theory + Practical)	√	√				√				√	
	DSE-A 4 Biomathematics And Biostatistics (Theory + Practical)	√	√					√		√	√	
	DSE-B 3 Instrumentation And Biotechniques (Theory + Practical)	√	√	√			√	√	√	√		
	DSE-B 4 Project Work	√	√	√	√	√	√	√	√	√	√	

Department of Geography

UNDERGRADUATE SECTION

Model Reference: University of Calcutta, Syllabus for Geography (Honours) (CBCS)

with Effect from 2018- 2019

Programme Outcomes Nos	Programme Outcomes (PO)
PO A	**To prepare the students for a successful career in academic and administrative activities. Students are motivated for higher education and to take research as a career**
PO B	**To provide strong foundation in Earth Science as well as Social Science**
PO C	**To develop ideas about different aspects of physical, demographic, social, economic, regional and environmental geography, formulate and analyze complex scientific problems and find out the measures of sustainable development for the survival of the earth's environment.**
PO D	**To develop individual work by preparation individual Project Report, Laboratory Note book, and team work by functioning effectively as an individual or as a member in a group in practical classes, field work for the preparation of Field Report.**
PO E	**Ability to use survey instruments, topo-sheets, aerial photographs, satellite images, application of different Cartographic methods, application of softwares**
PO F	**To develop clear vision in solving different analytical problems of Geography**
PO G	**To develop the ability to prepare effective laboratory notebooks, to conduct**

	field survey and writing of Field Report, Project Report and prepare for effective presentations, and application of those in their academic purpose
PO H	**As Geography is a interdisciplinary science so helps to develop acumen to work with interdisciplinary groups**
PO I	**To develop the ability to engage in independent and life-long learning of the subject**
PO J	**To engraft scientific temperament in the students and develop interdisciplinary vision to enrich the subject for future**

Programme Specific Outcomes Nos	**Programme Specific Outcomes (PSO)**
PSO 1	**To educate in basic and emerging aspects of Geography for higher education and application in research of both physical and social Geography**
PSO 2	**To develop capacity, skill to understand the need for lifelong learning to be a competent professional**
PSO 3	**To equip with the knowledge of the assessment of air, water, soil, sound quality to develop quality of environment, application of cartographic techniques, sensing of space with the help of RS and GIS etc**
PSO 4	**To intimat with the knowledge of the subject and application in their field work and future studies**

Mapping of PO & PSO for Geography Hons Syllabus of University of Calcutta

Programme Specific Outcomes (PSO) Nos	**Programme Outcomes (PO)**									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
PSO 1	√	√	√	√	√	√		√		
PSO 2	√	√	√	√	√		√			
PSO 3	√	√	√	√	√	√		√		
PSO 4	√	√	√	√	√					

Programme Outcome mapping for Partial Semester wise Courses in Geography Honours under University of Calcutta

TABLE I

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)

		A	B	C	D	E
PART I 2018 Hons Papers 1 & 2	CC1-01 Geotect & Geomorph	√	√	√	√	
	CC1-02 Cartographic Technique	√	√	√	√	
	CC 2-03 Human Geography	√	√	√		
	CC 2-04 Thematic Mapping & Surveying	√	√	√	√	

TABLE II

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	B	C	D	E
PART II 2019 Hons Papers 3 & 4	CC 3 -05 Climatology	√	√	√	√	√
	CC 3- 06 Hydrology & Oceanography	√	√	√	√	√
	CC 3- 07 Statistical Method in Geography	√	√	√	√	√
	GEO-A-SEC-3- 01 Coastal Management/ Tourism Management CC 4- 08 Economic Geography	√ √	√ √	√ √	√	

	CC 4- 09 Regional Planning & Development	√	√	√	√	
	CC 4- 10 Soil Geography	√	√	√	√	
	GEO-A SEC Rural Development	√	√	√	√	

TABLE III (i)

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	B	C	D	E
PART III 2020 Hons Papers 5 & 6	CC-5-11 Research Methodology & field Work	√	√	√	√	
	CC-5-12 Remote Sensing & GNSS	√	√	√	√	
	GEO -A DSE 1 Climate Change	√	√	√	√	
	GEO -A DSE 1 Settlement Geography	√	√	√		
	CC-6-13 Geog Thought	√	√	√	√	
	CC-6-13 Disaster Management	√	√	√	√	
	GEO-A-DSE 3 Environmental Issues in Geography	√	√	√	√	
	GEO-A-DSE 4 Resource	√	√	√	√	

	Geography					

TABLE III (ii)

COURSE DURATION	COURSE DETAIL	PROGRAMME OUTCOME (PO)				
		A	B	C	D	E
PART III 2020 Hons Papers 7& 8	Geographical Thought	√	√	√	√	√
	Disater Managment	√	√	√	√	√
	DSE 3 Environmental Issues in Geography	√	√	√	√	√
	GEO-A-DSE 4 Resource Geography	√	√	√	√	√