NETAJI NAGAR COLLEGE FOR WOMEN

170/13/1 N.S.C BOSE ROAD, REGENT ESTATE, KOLKATA

Re-Accredited by NAAC with Grade B+ with CGPA of 2.58

Programmes outcomes,

Programmes specific outcomes and course outcomes

Programme outcomes (PO)

Netaji Nagar College for Women is an educational institution of Kolkata disseminating knowledge for Honours and General Degree Courses, as per the syllabus structured and approved by the affiliating University of Calcutta. The programmes offered in this institution resolves to help the students find a focussed path in their careers thereby creating educated, independent and rational minded women out of them. It aims to equip the students with in-depth knowledge and skills which would cater to their employability and give a glimpse of further higher education in future.

Programme outcomes: B.A.Honours

PO1.Be made aware of creative and critical thinking, intellectual agility and nurture in them innovative lines of thought coupled with academic skills.

PO2.Able to display in depth disciplinary knowledge in at least one discipline of social sciences and develop expertise to address research-based problems.

PO3.Help them to imbibe socio-cultural, community and environmental awareness and be responsible citizens.

PO4.Make them conscious of one's cultural identity and values and understand the significance of cultural intercourse and harmony.

PO5. To foster among the students a spirit of clear and rational thinking, based on their studies of society, history and culture and made conscious of women empowerment.

PO5. To train them with proper communication skills for academic expression of thoughts and ideas.

PO6. Help them to display outstanding integrity of character, compassion and leadership qualities along with values of social commitments.

PO7. To equip them with digital literacy and information.

Program Outcomes: B.Sc Honours

Upon successful completion of Three-year Bachelor of Science (B.Sc) Honours degree program, the Graduate students will be able to-

PO1. Acquire in-depth knowledge and thorough competence in theoretical as well as practical courses, in at least one discipline of science.

PO2. Demonstrate essential literacy and communication skills enabling them to convey several ideas to diverse audiences (scientific community as well as society at large) in an effective manner.

PO3. Understand environmental issues and demonstrate the knowledge of and need for sustainable development.

PO4. Apply ethical principles in professional and personal domain, recognize moral values, take personal accountability and fulfil social responsibilities.

PO5. Pursue higher studies i.e. Master's degree (M.Sc) following which may apply for Ph.D in Indian universities or in Foreign Universities.

PO6. Prepare for qualifying in State/National/International level examinations like SET, NET, GMAT, CAT, TOEFL, GRE etc.

PO7. Compete in all India level entrance examinations like GATE, JAM etc. for seeking admission for postgraduate programs in any of the reputed IIT's.

PO8. Develop proficiency in scientifically-driven analytical skills, critical/ innovative thinking and problem-solving abilities by application of scientific methods (qualitative and quantitative), for conducting high-level work as interdisciplinary scholars or pursuing independent research in future.

PO9. Pursue B. Ed, for getting job as a teacher in various schools.

PO10. Get an opportunity to join Indian Civil Services as IAS, IFS etc.

PO11. Apply for Professional courses like M.B.A and get jobs in Marketing, Business & Banking sector.

PO12. Be gainfully employed in government sectors by UPSC, Railway recruitment exams etc. and also as technical persons in Government Research labs.

PO13. Apply for various scholarships/ freeships etc. provided by the Institution/ Government/Non Govt. agencies.

Program Outcomes: B.A General

Netaji Nagar College for Women offers general courses in the Arts stream in six different subjects namely, 1. Bengali, 2. English, 3. Economics, 4. Education, 5. History, 6. Philosophy and 7. Political Science and 8. Film Studies. The Program Outcome of the B.A General Course as a whole has been listed below:

PO1. Develops respect and tolerance for every culture, language and religion through a study of their origin and evolution.

PO2. Helps in enhancing the general knowledge of the students not only on a regional basis but also from a global perspective through invigorating tutorial topics and quiz competitions.

PO3. Creates general awareness among students about various social and environmental issues, through various seminars, invited lectures etc, apart from regular classes thus, creating sympathetic and responsible citizens.

PO4. Promotes social awareness and social interaction of students through the organization of various programs by the NSS (National Service Scheme) unit of the college thus, making significant contribution towards society.

PO5. Help students to develop an interdisciplinary approach in viewing and solving any social, regional or local problem.

PO6. Empower women by making them aware of the existing laws for protection of women's rights.

PO7. Helps in development of writing and communication skills, content development etc., thus equipping students for pursuing higher studies or various job opportunities in future.

PO8. The course helps to enable students to make important contributions to corporate life.

PO9. The course help students to analyse and edit films, teaches the techniques for dialogue writing and short film making, opening up new future job prospects for students.

PO10. The course also offers various job opportunities for students in different fields like teaching, administration, media jobs, film making, editing etc.

Program Outcomes: B.Sc General

Bachelor of Science B.Sc course provides theoretical as well as practical knowledge of different subject areas such as Physics, chemistry, Mathematics, Food and Nutrition, Environmental Science, Zoology, Physiology, Botany, Economics etc.

Strongly interested students who have a background in Science and Mathematics will be benefited by obtaining this course. The course is also beneficial for students who want to choose multi and interdisciplinary science carrier in future. Various programme outcomes are highlighted below:

PO1. The basic knowledge of the science subjects like Physics, Chemistry, Botany, Zoology Mathematics etc. is developed by this course.

PO2. It helps to develop scientific understanding of a person that is beneficial for the society as the scientific developments can make a society or nation to grow at a rapid motion.

PO3. Completion of these course open a scope for the students to go for higher studies that is M.sc and do some research for the welfare of mankind.

PO4. After higher studies students can serve as a Scientist and can also look for professional job oriented courses.

PO5. This course also offers a chance for serving in Indian Navy, Army, Air Force officer jobs. Student after completion of this course have the possibility to join Indian Civil services as IAS, IFS etc.

PO6. Science graduates can also go to serve in industries or they may have an option for establishing their own industrial unit.

PO7. After completing the B.Sc degree there are various options available for the science students such as teaching jobs in school. Besides this they can be directly recruited by big MNC's.

PO8. This course enhances the ability to create, select and apply appropriate techniques, resources, and modern science with IT tools.

PO9. Students can also get jobs in marketing, business and other technical fields. Completion of B.Sc graduate course helps to recruit in the bank sectors to work as customer service executives. Finally employment in the government sectors is the most common option of job for Science graduates.

Department of Bengali – Programme Outcomes

History of the Bengali language has evolved over time and through the ages. No wonder that the Bengali language with its basic characteristics and nuances has a rich cultural heritage. The core and the DSE courses aim to provide an all encompassing knowledge about the origin, gradual evolution and the development of Bengali literature and culture spanning from pre 19th century to the 20th century. The course helps the students to get a thorough glimpse of the growth of Early, Mediaeval and Modern Bengali Literature and its inseparable connection with our state's culture. More over the students are enlightened about the historical analysis of the Bengali literature and its perceptible changes under the colonial influence. This is on one hand make the students aware of the historical perspective and arouse their interest in the history, culture, economy and society of Bengal and Bengali people on the other. In their journey through their study of Bengali literature they are made conscious of the society and culture and history of Bengal through their knowledge of Bengali prose, poetry, short story, drama and novel. They are thus enlightened on the origin of Bengali language originating from the Indo- European family of languages and how regional variations occurred within it through the passage of time. The skill enhancement course gives them a vast knowledge on the growth of printing press, various publications leading to development of mass culture. These are expressed through writings in various journals, periodicals , newspapers and magazines .Higher studies in the field would open up avenues in various job opportunities like as journalists, translators, librarians, teachers and in spheres of Research ,Advertising, Print media, Audio visual media and Publishing Houses.

Programme Outcomes (Honours Course):

PO1. History of the study of Bengali language would help them to understand the stages of development of Bengali language from its origin to the 20th century. Students are thus made aware of the Bengal heritage and World literature too. It enables them to make journeys from 8th to 12th century of the subcontinent to Contemporary representations in literature.

PO2. Study of the language of the linguistics in the historical perspective would help them to learn how Bengali language evolved and changed over time.

PO3. It would help them to grasp the complexity of the language and as a communicative medium in the proper social,cultural and cognitive perspective.

PO4. Aquire the technical vocabulary of the language.

PO5. Study of the classics would make them aware of the sociopolitical impact of nineteenth and twentieth century national uprisings and the colonial legacy.

PO6. Studying Bengali literature can raise students' awareness about Bengal's culture.

PO7. Aware of punctuations writing clarity.

PO8. The knowledge of the language would help them to develop the use of editing and proof reading. The study helps to familiarize the learners with varied openings of future research activities in other literature, linguistics, comparative literature, translation studies, religious

studies, social studies.

PO9. It leads to an understanding of International, National, Regional literature and helps in critical evaluation of the current dynamics of life.

PO10. It creates a consciousness of gender equality and women empowerment and reduces or creates the sense of racial and gender discrimination. Student comes into closer proximity with different values and morality of human life through novels, poetry, short stories and essays.

PO11. It acquaints the students with different marginal subaltern and folk culture of this subcontinent and enriches them with the knowledge and existence of the 'OTHER'.

PO12. The discipline makes students aware of the varied socio-cultural diversity and thereby developing a concern for society. This also enables and transforms the learners into responsible Indian citizens.

Programme Specific Outcomes (Honours Course):

PSO1. Bengali literature would help the students of the discipline of Bengali literature and language to construct literal arguments based on primary source materials. This would help them to develop the knowledge of literal argument and research. They would acquire an understanding of the methods and techniques of research and develop an analytical attitude in the field of Literature in particular and Sociocultural aspects in general.

PSO2. The students would be equipped with the skill to understand the present and shape the future on the basis of their acquired knowledge of the past (such as: from Charjapada,Srikrishnakirtana,Mangal kavya, padabali sahitya etc) . They would be able to enlighten the society on how to apply the past knowledge for building up a glorious future. They get a clear perspective of modernism from the writtings of Vidhyasar, Raja Rammohan Roy, Pyarichand Mitro, Michel Madhusudan Dutta, Rabindranath Tagore, Vivekananda and many more. With this goal in mind, the students are taken to different educational tours. For example Indian Museum, Swami Vivekananda's residence, Netaji Bhavan, Jorasanko Thakurbari and different theatre shows to acquire the knowledge of performing arts and literature.

PSO3. A bright student of Bengali enriched with the analytical, logical and reasoning skills would be able to pursue a career of a researcher, teacher, content writer, script writer, voice artist, film critic, translator, copy writer in different publication houses as well as in advertisement farms.

PSO4. The study of Bengali literature and language would inspire the students with a dynamic thought process and gain knowledge of the different interpretations on the progress and evolution of civilization. This would help them to have a thorough grip over the different trends and trajectories in the Bengali society.

PSO5. To be acquainted with the ICT tools for presentation in the Seminars.

Programme Outcomes (General Course):

PO1. The students are made aware of the meaning of 'Bengali Literature' and 'Bengali Language'.

The chronology of linguistics and literature of our glorious past would help them to connect the past with the present.

PO2. To enlighten them on different values and morality of human life through novels, poetry,short stories and essays make them understand the narratives of ancient, medieval and modern Bengali history and culture along with the changes in the world scenario through the Core and Discipline specific courses.

PO3. The Skill Enhancement Courses (SEC) help to develop knowledge and skill that strengthen the future career goals and real-world skills of the students. The BA Bengali programme courses are inter-disciplinary, keeping in mind that specialisation in Bengali is the key to acquire cognitive skills from other disciplines.

PO4. The knowledge of the language would help them to develop the use of editing and proof reading. The study helps to familiarize the learners with varied openings of future research activities in other literature, linguistics, comparative literature, translation studies, religious studies,social studies,

Programme Specific Outcomes (General Course):

PSO1. They would be able to acquire sense of history of Bengali literature and language. Students who learn Bengali language will be able to know Indian culture deeply. Because it is the only language which is mixture of Austric, Sanskrit, Dravir and Tibetian.

PSO2. The study would help them develop communication skills to express various perspectives, including writings and oral presentations.

PSO3. Bengali as a discipline would make them aware of the political, social, economic, cultural and intellectual heritage of our country.

PSO 4. The in-depth knowledge and skills that bengali as a discipline offers would cater to their future employments as teacher, content writer, script writer, film critic, translator, copy writer in different publication houses as well as in advertisement farms.

PSO5. The study of Bengali literature and language would inspire the students with a dynamic thought process and gain knowledge of the different interpretations on the progress and evolution of civilization. This would help them to have a thorough grip over the different trends and trajectories in the Bengali society.

NETAJI NAGAR COLLEGE FOR WOMEN
Department of Bengali
Course Outcome of Bengali (Honours)

SL NO.	SEMESTER	COURSE CODE BNGA	COURSE NAME	COURSE OUTCOME(Cos)
	SEM I (JULY TO DECEMBER)	CC-1-1	History of Bengali Literature (up to 1800 AD) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. An idea of the original patterns related to Bengali language and literature is growing among the students C.O.2. The students became aware of the social history of ancient Bengal. C.O.3. A clear idea was formed about the religious sentiments and religious movements of the time. C.O.4. The original patterns of Bengali lyric poetry and the atmosphere of religion reflect the image of contemporary politics. C.O.5. Students' ideas about the emergence and contribution of Muslim poets in Bengali literature grew. C.O.6. As a whole, an aspect of the history of Bengal should come up through this course.
	SEM I	CC-1-2	Descriptive Linguistics and Bengali Language Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. The idea of sounds, letters, letters and words grows. C.O.2. The students became aware of sentence structure in Bengali. C.O.3. There is also a picture of how foreign words other than Bengali have enriched the Bengali vocabulary. C.O.4. Students benefit greatly from this course in composing creative literature.
2	SEM II (JANUARY TO JUNE)	CC-2-3	History of Bengali literature 19th century [Bangla sahithyer itihas (unish shotok)] Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. Students will be able to get a clear idea about the outlook of 'modernism' in Bengal poetry. C.O.2.The gain ideas about various plays written by notable playwrights in Bengali literature. Students can realise the intense reality of the drama in their daily life. C.O.3. students will gain detailed knowledge about some of the prominent branches of Bengali literature such as novels prose and short stories. Students mental and intellectual development will be possible through reading the writings of different authors.

	SEM II	CC-2-4	Bangla sahityo:probeshok path (Entrant text to Bengali literature) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. Students will learn about poetry of three eras of Bengali literature. By reading those texts they can feel the differences between poetry written at different time. C.O.2. Students will be aware about Bengali fiction. Students will learn more about different authors by reading novels and short stories. C.O.3. Modern drama, prose and essays will help students to develop innovative skills.
3	SEM III (JULY TO DECEMBER)	CC-3-5	History of Bengali literature 20th century [Bangla sahithyer itihas (bingsho shotok)] Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1.Students will acquire knowledge about poets and dramatist of twentieth century and about their poetry and drama. C.O.2. Students will acquire knowledge about novelists and short story writers of twentieth century and about their creations. C.O.3. Students will acquire knowledge about essayists and their essays and about the evolution of some Periodicals.
	SEM III	CC-3-6	Oitihasik Bhasabigyan (Historical evolution of Bengali language) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. Students will learn about the evolution of Bengali language from an ancient Arian language to a modern Arian language. C.O.2.Students will learn about the linguistic features of ancient and medieval Bengali language through ‘Charjapad’ and ‘Srikrishnakirtan’. C.O.3. Students will learn about the linguistic features of later medieval Bengali language through ‘’Annandamongol’ and modern Bengali language through ‘Paribrajak’ written by Swami Vivekananda.
	SEM III	CC-3-7	Kotha sahityo (Prose literature) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. Students will learn about socio political aspects of a particular time, position of women in a family structure etc. from novels like ‘Jogajog’ by Rabindranath Tagore or ‘Denapawna’ by Saratchandra Chattopadhyay. C.O.2.From novels like ‘Padmanodir majhi’ by Manik Bandhyopadhyay or ‘Aranyer Odhikar’ by Mahasweta Devi students will get a clear idea about subaltern culture in Bengali society.

				C.O.3.Students will be introduced with the vast world of short stories written by Rabindranath Tagore as well as they become aware of the modern form of Bengali prose.
	SEM III	BNG-A-SEC-A-3-2	Byaboharik Bangla (Practical knowledge of Bengali) Full Marks-100, Credit-2	C.O.1.Fom the skill enhancement course student can learn how to write a story from a given cue. C.O.2. They use to practice how to write a script for audio visual media and drama from a literary text. C.O.3. Students will learn to use rhetoric and prosody in poetry and about proper pronunciation. It will help them to enhance their ability of recitation. C.O.4.Students can learn about interrelationship between film and literature and adaptation through the classics like 'Pather Panchali' by Satyajit Ray,'Khudito Pasan' by Tapan Sinha, 'Bari theke paliye' by Rittik kumar Ghatak.
	SEM IV	CC-4-9	Chondo olonkar o kabytobbyo (Rhetoric and Prosody, Poetics) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.O.1. It will create a clear conception about rhetoric and prosody. C.O.2.Students will learn to use rhetoric and prosody in poetry. It will help them to enhance their ability of recitation. C.O.3. They will acquire knowledge about Sanskrit and Bengali "kabyatattbo"[shobdo(word),olonkar(rhetoric),riti(style),dhoni and rasa
	SEM IV	CC-4-10	Probondho o bibidho rochona (Several Essays) Full Marks-100, Credit-6 (Th:5+Tu:1)	C.0.1. Student will learn about different types of essays and essaist and enrich them with different ideas. C.O.2.These essays will enlighten the students with social, political and cultural consciousness. C.O.3.They will learn to write different types of essays.
	SEM IV	BNG-A-SEC-B-4-1	Byaboharik Bangla o sahity gobeshonar podhyotibigyan (Practical knowledge of Bengali and research methodology) Full Marks-100, Credit-2	C.O.1. Students will enhance their skill of witing report for print media. They will learn how to write Institutional letter and fictional interviews. C.O.2.They can acquire the skill to write advertisement for different media and about translation. C.O.3.Students will know about research methodology which may help in their higher studies.

NETAJI NAGAR COLLEGE FOR WOMEN
Department of Bengali
Course Outcome of Bengali (General)

SL	SEMESTER	COURSE CODE BNGA	COURSE NAME	COURSE OUTCOME(Cos)
1	SEM 1 (JULY TO DECEMBER)	BNG-GCC/GE-1-1 Full Marks-100, Credit-6 (Th:5+Tu:1)	History of Bengali Literature (modern age)	C.O.1. Students became aware of the modern form of Bengali prose. C.O.2. The picture of social change came up through the prose of social reformers. C.O.3. The students became aware of the trend of the poems and plays before and after Rabindranath. C.O.4. The students became aware of the trend of modern Bengali novels and short stories.
2	SEM 2 (JANUARY TO JUNE)	BNG-G-CC/GE-2-2 Full Marks-100, Credit-6 (Th:5+Tu:1)	Oitihasik Bhasha Bigyan, chondo o alankar (Linguistics, rhetoric and prosody)	C.O.1. Students will be able to know the details about the origin of Bengali language. C.O.2.It will create a clear conception about rhetoric and prosody. C.O.3.Students will learn to use rhetoric and prosody in poetry. It will help them to enhance their ability of recitation
3	SEM 3 (JULY TO DECEMBER)	BNG-G-CC/GE-3-3 Full Marks-100, Credit-6 (Th:5+Tu:1)	Bangla kabya kobita o natok (Bengali poetry and drama)	C.O.1. Students will acquire knowledge about 'Padavali Poetry' which reflects an earthy view of divine love. From the selected "Padas"(gathering of songs) they can get a clear concept about Vaisnab religion and philosophy. C.O.2.Students will acquire knowledge about the style of prose poetry from Tagore's 'Punascha' kabya. From selected text they can learn about human problems including life and death. C.O.3. Students become aware of the variants of Bengali poetry. They will be able to know about the movement of modern poetry after Rabindranath. They can gather ideas about the art form of modern poetry from selected text.

				C.O.4.The drama ‘Raja o Rani’ by Rabindranath Tagore was his first five act tragedy play. From this text student can understand the form and structure of Shakespearian tragedy.
	SEM 3	BNG-G-SEC-A-3-2 Full Marks-100, Credit-2	Byaboharik Bangla (Practical knowledge of Bengali)	C.O.1.Fom the skill enhancement course student can learn how to write a story from a given cue. C.O.2. They use to practice how to write a script for audio visual media and drama from a literary text. C.O.3. Students will learn to use rhetoric and prosody in poetry and about proper pronunciation. It will help them to enhance their ability of recitation. C.O.4.Students can learn about interrelationship between film and literature and adaptation through the classics like ‘Pather Panchali’ by Satyajit Ray,’Khudito Pasan’ by Tapan Sinha, ‘Bari theke paliye’ by Rittik kumar Ghatak.
4	SEM 4 (JANUARY TO JUNE)	BNGG CC/GE4-4 Full Marks-100, Credit-6 (Th:5+Tu:1)	Bangla kotha sahityo o probondho (Prose literature and Essays)	C.O.1.They will learn to appreciate literary values of the texts like Novel (Pollisomaj), short story (Na,Puimacha,Haraner Natjamai,Oshhomedher Ghora,Motilal Padri,Chinnomosta) C.O.2.They will go through essays (Kekadhoni, Purbo o Poschim,Meghdut,Sikkhar Milon) by Rabindranath Tagore and learn about Indian Modernism. C.O.3.The lives and works of the novelists, essayists and short story writers will certainly rejuvenate them with social morality as well as individual responsibility.
	SEM 4	BNG-G-LCC (2)-4-1 Full Marks-100, Credit-6 (Th:5+Tu:1)	Bangla Bhasha vigyan, sahityer roopbhed o kabyo (Linguistics, multifaceted aspects of literature and poetry)	C.O.1. Students will gain detailed knowledge about Bengali language, vocabulary and phonetic changes. C.O.2. Students will be introduced to literary variations and comparative discussions. C.O.3. Students will be able to read 'Meghnad badh Kavya' written by Michael Madhusudan Dutta and analyse the various characters in the literary epic and develop a rational and analytical prospective among them.

	SEM 4	BNG-G-SEC-B-4-1 Full Marks-100, Credit-2	Byaboharik Bangla o sahity gobeshonar podhyotibigyan (Practical knowledge of Bengali and research methodology)	C.O.1. Students will enhance their skill of witing report for print media. They will learn how to write Institutional letter and fictional interviews. C.O.2.They can acquire the skill to write advertisement for different media and about translation. C.O.3.Students will know about research methodology which may help in their higher studies.

NETAJI NAGAR COLLEGE FOR WOMEN
Department of Bengali
Course Outcome of Bengali (Honours and General)

SL	PART III SUBJECT CODE	PAPER	COURSE OUTCOME
1	HONOURS BNGA FULL MARKS-100	V FIFTH	C.O.1. The students became aware of the variants of Bengali poetry. C.O.2. The students became aware of the movement of modern poetry during and after Rabindranath. C.O.3. Students develop ideas about the art form of modern poetry. C.O.4. This course became helpful in reading and writing poetry among the students.
2	HONOURS BNGA FULL MARKS-100	VI SIXTH	C.O.1. Students are made aware of the diversity of the subject matter of Rabindranath's short stories. C.O.2. The students became aware of the novelty of variety in the subject matter of Bengali novels. C.O.3. The students became aware of the variety of art forms and subjects of pre-independence and post-independence Bengali short stories.
3	HONOURS BNGA FULL MARKS-100	VII SEVENTH	C.O.1. The students developed an idea about the variants of Bengali essays and articles. C.O.2. Students can understand the features of the letter which became literature by adopting Rabindranath's ‘Chinnapatra’. C.O.3. The students became aware of the trends of the literary criticism of the time. C.O.4. This course is helpful for students to write creative essays.
4	HONOURS BNGA FULL MARKS-100	VIII EIGHTH	C.O.1. Basic ideas about Sanskrit, English and Hindi literature were developed among the students. C.O.2. Students are made aware of the theoretical form of poetry. C.O.3. Students are made aware of the elements in which an essay becomes literature.
5	GENERAL BNGG FULL MARKS-100	IV FORTH	C.O.1. The terminology helps the students to acquire ideas in other languages. C.O.2. Improper writing can be corrected through proof correction and later it is helpful for students to correct incorrect writing. C.O.3. Students become aware of the phonological and morphological features of Bengali language. C.O.4. Students can make a living by focusing on interviews and advertisements.

NETAJI NAGAR COLLEGE FOR WOMEN

DEPARTMENT OF BOTANY

PROGRAMME OUTCOMES

A. **B.Sc. BOTANY (HONOURS)(1+1+1/CBCS)** – At the end of the 3-year programme, Honours students of this department will be equipped with the following qualities:

PO-1 **Clarity of Thought**: Recognize what is expected of them in different situations and what they wish to achieve.
PO-2 **Confidence**: In their capabilities, in conducting their day-to-day affairs, in their interactions with others, and in seeking out their objectives.
PO-3 **Perseverance**: To keep working diligently till they reach the desired goal; be it in studies or any other work.
PO-4 **Discipline**: Be able to prioritize between different works at any particular time and immerse oneself completely into it.
PO-5 **Social Compatibility**: The ability to empathize with others and work as a team player.
PO-6 **Multitasking**: The capability to adapt to performing multiple duties in life.
PO-7 **Communication**: Effectively able to communicate their thoughts, ideas and understanding in the medium of instruction English, verbally, in the written format, as well as through the electronic mode.
PO-8 **Environmental Awareness**: Appreciate the fragility of the environment and understand their duty towards improving it.
PO-9 **Scientific Thinking**: Understand the myriad plant forms on earth, their various life processes, the contribution of plants towards sustenance of all life on the planet, and how this knowledge can be transferred from the classroom to be applied in practice to benefit all humankind.
PO-10 **Informed Decision Making**: Be aware of the latest avenues of employment available to them, and take critically analyzed decisions on the options best suited for them after considering all perspectives, social and personal, to choose from among higher studies, professional courses, or immediate jobs.

B. **B. Sc. BOTANY (GENERAL) (1+1+1/CBCS)** – At the end of the 3-year programme, General students of this department will be equipped with the following qualities:

PO-1 **Clarity of Thought**: Recognize what is expected of them in different situations and what they wish to achieve.
PO-2 **Perseverance**: To keep working diligently till they reach the desired goal; be it in studies or any other work.
PO-3 **Discipline**: Be able to prioritize between different works at any particular time and immerse oneself completely into it.
PO-4 **Social Compatibility**: The ability to empathize with others and work as a team player.
PO-5 **Scientific Thinking**: Understand the myriad plant forms on earth, their various life processes, and the contribution of plants towards sustenance of all life on the planet.

PROGRAMME SPECIFIC OUTCOMES

B.Sc. BOTANY (HONOURS)(CBCS)

CC-1: This study will help to understand the basic concepts of lower group of plants. Students will acquire fundamental knowledge regarding algal, bacterial and viral diversity, their life cycle and economic importance through theory and practicals.

CC-2: General idea about features of Fungi, their uniqueness, how they are classified, their types and their importance; Important concepts of Plant Pathology, details of the host-parasite interaction during disease development, disease control techniques, and major diseases.

CC-3: Anatomical features of plant primary parts, secondary growth, the principles of physics governing distribution of mechanical tissues in plants, and its use in taxonomy, pharmacognosy and forensic science.

CC-4: Know distinguishing features of Archegoniate groups, their phylogenetic and economic significance.

CC-5: Learn about Pteridophyte and gymnosperm plant fossils from different eras and their evolutionary significance; structure of spores and pollen and their utility in modern life.

CC-6: Study of embryology helps the students to gain knowledge on structure and development of plant reproductive organs with a better understanding of the process of fertilization, endosperm and embryogeny.

CC-7: Helps in understanding the rules for naming of plants, their classification and preservation, their applications in different fields; an idea of modern systematics, and the features of some of the large plant families.

CC-8: Awareness about Flora of different Phytogeographic and Endemic regions of India, and with Ecological concepts, Succession, Phytoremediation and Biodiversity Conservation; familiarity with theories of Evolution and concepts of Speciation, Co-evolution, Adaptive Radiation and Reproductive Isolation, with phylogenetic patterns seen in different plant groups.

CC-9: It gives knowledge about contribution of major economically important crops to increase and improve supply of medicines, food fibres and other plant products. To create awareness on the utility of drugs of natural origin, which are not only economical but even safer too. This study will make them aware of natural resources and the importance of conserving it along with the role of plants in human welfare.

CC-10: Deals with the behaviour of genes and chromosomes, and how they affect inheritance; changes in their structure, and the arrangement of genes in chromosomes.

SEC-A-1: shows the practical use of algae, fungi and bacteria in different industries, for the benefit of people.

SEC-B-4: This study will help to know the history of mushroom culture, scope and present status of mushroom cultivation in India and other parts of the world. It also explores the economic importance of mushrooms, different delicious recipes of mushrooms and commerce in the mushroom industry.

B.Sc. BOTANY (GENERAL)(CBCS)

CC-1: Students will be able to compare and contrast the characteristics of the different groups of algae, fungi, bryophytes, their modes of communication, life histories and their significance for the environment; understand basic pathological terms and major diseases; anatomy of plant parts and stele, and how secondary growth takes place.

CC-2: This study will help the students to learn about details of pteridophytes and gymnosperms and their fossil forms; morphology of plant reproductive parts, and about major angiosperm families.

CC-3: This conveys an idea about the cell ultrastructure, and the behaviour of chromosomes and genes.

CC-4: This comprehensive course will help to understand the nature and basic concepts of all the plant cell components and their metabolism at the molecular level. Additionally physio-biochemical properties of a plant and it's growth regulators will be highlighted.

B.Sc. BOTANY (HONOURS)(1+1+1)

PAPER-V: Awareness about the fundamental principles and processes of biochemistry, physiology and pharmacognosy.

PAPER-VI: Conveys details of the cell ultrastructure, genes and chromosomes; and an introduction to the fundamentals of biotechnology, and plant breeding processes.

B.Sc. BOTANY (GENERAL)(1+1+1)

Students can apply the knowledge towards various plant diseases and their control measures. Active constituents from plant sources will lead to rapid developments in Pharmacognosy and Phytochemistry. On completion of the course, students will be able to understand the scope and importance of Plant Pathology. Genetic Engineering and artificial gene transfers are some of the topics that students may explore for development of desired crops.

COURSE OUTCOMES

B.Sc. BOTANY (HONOURS)(CBCS)

SEM-I

CC-1: PHYCOLOGY AND MICROBIOLOGY

PHYCOLOGY

1. Understand the general account about algal growth, morphology, cell structure, sexual evolution along with their habitats.
2. Classify algae with salient features up to phylum and to know the diversity among Algae.
3. Understand Cyanobacterial cellular structure and heterocyst formation
4. Understand cell division, structure and sexual spore formation of Bacillariophyta
5. Know about the life histories of important algae.

PRACTICAL

Students will gather knowledge about reproductive structure of *Oedogonium*, *Chara*, *Ectocarpus* and about the morphological features of *Gloeotrichia, Volvox, Vaucheria, Coleochaete, Polysiphonia,* Centric and Pennate diatom*, Laminaria* and *Sargassum*

MICROBIOLOGY

Basic idea on discovery and types of plant Virus, structure and multiplication of virus with an example, transmission, reproduction and concept of viroid, prion.

Brief idea on discovery of Bacteria, difference of Archaea and Bacteria, characteristics of some major groups, detailed cell structure, reproduction, structure and formation of endospore.

PRACTICAL

aspects on preparation of Bacterial media, sub-culturing and staining.

CC-2: MYCOLOGY AND PHYTO-PATHOLOGY

MYCOLOGY

1- An introductory idea and general account of Fungi.
2- Classification of fungi and diagnostic characters of fungal subdivisions.
3- Life histories of representative fungi.
4- Types of mycorrhizae and their importance.
5- Types of lichen, their reproduction and importance.
6- Practical- Study of the external and internal structures of fungi; study of fungi during field work.

PHYTO-PATHOLOGY

1- Introduction to general terms and definitions relevant to Plant Pathology.
2- Study of the Host-Parasite interaction, and the features involved.
3- Techniques of Plant Disease Management.
4- Detailed study of some important plant diseases.
5- Practical- Performance of pathological processes in the lab, and study of diseased structures.

PRACTICAL

Macroscopic and microscopic study of fungi.

Simple pathological processes such as media preparation, sterilization, isolation and subculturing.

Identification of pathological specimens from different diseased plant parts.

Local field trip.

SEM-II

CC-3: ANATOMY

Structure and composition of cell wall, cell wall thickening, structure of plasmodesmata, concept of apoplast and symplast.

Concept and types of stomata, stele, stelar evolution, primary structure of plant organs like stem, root and leaf emphasizing the differences in monocot and dicot.

Concept of normal and secondary growth in stems and roots with some examples, mechanical tissues and their distribution.

Basic idea on root apex and shoot apex, adaptive anatomical features of xerophytes and hydrophytes.

Application of anatomical knowledge in various fields like taxonomy, pharmacognosy and forensic biology.

PRACTICAL

knowledge on anomalous growth by section cutting and concept of different types of stomata, cells, adaptive anatomical features from permanent slides.

CC-4: ARCHEGONIATES

BRYOPHYTES

1- An introductory account of Bryophytes and their classification.
2- Life histories of some representative bryophytes.
3- Unique features of bryophytes and their phylogeny.
4- Ecological and Economic importance of bryophytes.

Practical-

study of internal and external structures of bryophytes; identification of common specimens in the field.

PTERIDOPHYTES

1- A general account of Pteridophytes and their classification.
2- Life histories of some representative pteridophytes.
3- Origin of pteridophyte groups as per the Telome theory.
4- The role of Heterospory in the development of the Seed habit.
5- The economic importance of pteridophytes.

Practical-

study of internal and external structures of pteridophytes; identification of specimens during excursions.

GYMNOSPERMS

1- Classification of gymnosperms with diagnostic features of various divisions.
2- Features and evolutionary significance of Pro-gymnosperms.
3- Life histories of representative gymnosperms.
4- Economic importance of gymnosperms.

PRACTICAL-

Macroscopic and microscopic study of internal and external structures of bryophytes, pteridophytes and gymnosperms;

Study of specimens during field work.

SEM-III

CC-5: PALEOBOTANY AND PALYNOLOGY

1- The Geological Time Scale with plant groups dominant in different ages.
2- General idea about plant fossils- their types, preservation modes, nomenclature and importance.
3- Study of representative fossil pteridophytes and their importance in evolution.
4- Study of reconstructed fossil gymnosperms.
5- The Indian Gondwana system- their divisions and major fossils.
6- Study of spores and pollen – Palynology – their classification, stratification and sculpturing.
7- Major fields of application of Palynology.

PRACTICAL-

study of macroscopic and microscopic fossils and pollen.

CC-6: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

MORPHOLOGY

Inflorescence types, floral development, fruits and seeds.

EMBRYOLOGY

1. Pre-fertilisation changes: Understand different pre-fertilization changes viz., microsporogenesis, megasporogenesis, microgametogenesis and megagametogenesis
2. Fertilisation: To know method of fertilization via pollen germination, pollen tube- growth, entry of pollen into ovule and discharge; understand double fertilization of Angiosperm
3. Post-fertilization changes : embryogenesis in *Capsella* and 3 types of endospem development.
4. Apomixis & Polyembryony: General idea about apomixes, apospory, apogamy and polyembryony, and their different types

PRACTICAL-

Study of types of inflorescence, flowers, fruits and ovules.

CC-7: TAXONOMY OF ANGIOSPERMS

Introduction on plant taxonomy, Nomenclatural rules such as rules of ICN, type concept, priority of publication etc.

Describe different classificatory systems of plants with examples of a natural and a phylogenetic classificatory system, brief idea on APG system, phenetics and cladistics.

Basic idea of Herbaria, Botanical Gardens, Keys of identification, data sources in taxonomy.

Diagnostic features, systematic position and economically important plants of some selected families such as Magnoliaceae, Asteraceae, Poaceae, Orchidaceae etc.

PRACTICAL

knowledge on diagnostic features of some selected families by flower dissection, spot identification of some common plants and field visit.

SEC-A: APPLIED PHYCOLOGY, MYCOLOGY AND MICROBIOLOGY

APPLIED PHYCOLOGY

1- Uses of algae as food and as source of phyco-colloids and diatomite, and various biotechnological products obtained from them.

APPLIED MYCOLOGY

1- Fungi as sources of food and various useful industrial products.

APPLIED MICROBIOLOGY

1- Uses of microbes in production of useful industrial products, as biofertilizers and in mineral recovery.

SEM-IV

CC-8: PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION

PLANT GEOGRAPHY

1- Major phytogeographical regions of India and their flora.
2- Endemic flora of India and the Theories of Endemism.

PRACTICAL-

long excursion to study a different phytogeographical region; study of local flora and submission of a report on it.

ECOLOGY

1- Preliminary ideas and fundamental ecological concepts.
2- Basics of Community Ecology and Plant Succession.
3- Plant Metallophytes and Phytoremediation.
4- Biodiversity and its conservation.

PRACTICAL-

study of vegetation by Quadrat method; measurement of dissolved oxygen and free carbon dioxide at different sources; comparison of anatomical changes in leaves due to pollution.

EVOLUTION

1- Different theories on evolution.
2- Brief ideas of concepts important to evolution- Selection, Speciation, Coevolution and Adaptive Radiation.
3- Simple idea about the phylogenetic patterns in different plant groups.

CC-9: ECONOMIC BOTANY

1. Develop critical understanding on the centre of origin of cultivated crops and their importance, introduction of major plants, loss of genetic diversity through crop domestication, evolution of new varieties and importance of germplasm diversity
2. To know the origin, morphology, processing and uses of major cereals – Rice and Wheat
3. Understand the origin, morphology and uses of legumes viz., gram and mung bean, importance of legumes to man and environment
4. Understand morphology of sugarcane, products and by-products of sugarcane industry; additionally to know about morphology, propagation and uses of Potato
5. Develop concept about different spices with reference to their family and parts used
6. Know morphological feature, processing and uses of Tea
7. Knowledge of classification, extraction and uses of fat and oils. Impact of mustard, soybean, coconut oil with reference to their botanical name, family and uses. General idea about essential oil, their uses, extraction processes and comparison with fatty oils.
8. General accounts of drug yielding plants and their health hazards with special emphasis on *Cinchona*, *Digitalis*, *Papaver*, *Cannabis* and Tobacco
9. General account of timber with special reference to Sal and Teak
10. Know morphology of Cotton and Jute, extraction of fibres and their uses.

PRACTICAL

1. Understand morphology and chemical nature of grain of rice and wheat
2. Develop knowledge about morphological features, fruit and seed structure of legumes and estimation of proteinaceous nature by microchemical tests
3. Detailed study of Sugarcane and potato by habit sketch and microchemical tests of cane juice and starch
4. Detection of tannin from Tea tree leaves
5. To confirm presence of fat in crushed seeds of Mustard
6. Morphological study of *Digitalis*, *Papaver* and *Cannabis*
7. Students will know about anatomical features of young stem of Sal and Teak
8. Lignin identification from transverse section of young Jute stem and tests for lignin through staining procedure
9. Local excursion will help students to gather practical knowledge about cultivation of major economically important crops and about the precaution taken in field condition.

CC-10: GENETICS

Brief idea of Mendelian genetics, concept of linkage and crossing over, detection and mechanism of crossing over, basic idea on gene mapping, ISH, FISH.

Concept of Epistasis and polygenic inheritance.

Chromosomal aberration-numerical and structural,

their types, reasons and consequences with examples.

Point mutation, types, molecular mechanism and DNA repair.

Concept of gene, overlapping gene, split gene, homoeotic gene, transposon and repetitive DNA.

PRACTICAL

knowledge on mitotic and meiotic Chromosome study by using root tip and flower bud. Identification of some normal and abnormal mitotic and meiotic stages studying permanent slides.

SEC-B: MUSHROOM CULTURE TECHNOLOGY

1. Gathering of knowledge about nutritional and medicinal value of edible mushrooms, different types of poisonous mushrooms.

   General account on edible mushroom viz., *Volvariella*, *Pleurotus, Agaricus.*

2. Development of concept about cultivation methods of mushrooms in details
3. Storage procedures and nutrition values of mushrooms in terms of carbohydrate, protein, vitamin, amino acid, crude fibre contents
4. Knowledge of different types of foods prepared from mushroom along with national and regional level research centres, marketing and exporting of mushroom.

B.Sc. BOTANY (HONOURS)(1+1+1)

PART-3

PAPER-V:

BIOCHEMISTRY

1. Fundamentals of Biochemistry.
2. Life molecules-carbohydrates, proteins, nucleic acids.
3. Bioenergetics and enzymology.
4. Membrane signalling.
5. Phosphorylation.

PHARMACOGNOSY

1. Organolepsis.
2. Secondary metabolites.
3. Pharmacologically active substances.

PLANT PHYSIOLOGY

1. Plant-water relations and stomatal physiology.
2. Phloem transport.
3. Photosynthetic pigments, electron transport, C3, C4 and CAM pathways.
4. Respiratory and pentose phosphate pathway, fatty acid oxidation.
5. Nitrogen metabolic pathways.
6. Plant growth regulators and their physiological roles.
7. Photomorphogenetic phenomena.
8. Dormancy and germination.
9. Senescence and ageing.
10. Stress physiology.

PAPER-VI:

CELL BIOLOGY

Concept of origin of first cell, Eukaryotic cell, Organellar DNA.

Basic concepts on the structure and composition of Nucleus, Nucleolus and Chromosome emphasizing the chromosome packaging, karyotype.

Idea of Cell cycle mechanism, its regulation with an example of Yeast, checkpoints, MPF and apoptosis.

PLANT BREEDING AND BIOMETRY

Methods of plant breeding and back cross, concepts of heterosis, hybrid seed production, male sterility and molecular breeding.

Methods of frequency distribution and random sampling, concepts of central tendency, test of significance, rules of probability and measurement of gene frequency.

PLANT BIOTECHNOLOGY

Basic introduction on totipotency, tissue culture media, process of callus culture, Micropropagation, Haploid Culture and Protoplast culture.

Brief concept of gene transfer, emphasizing *Agrobacterium* mediated gene transfer, reporter gene and transgenic plants.

GENETICS AND MOLECULAR BIOLOGY

Concept of linkage and crossing over, detection and mechanism of crossing over, basic idea on gene mapping, ISH, FISH.

Concept of Epistasis and polygenic inheritance.

Chromosomal aberration-numerical and structural,

their types, reasons and consequences with examples.

Point mutation, types, molecular mechanism and DNA repair.

Concept of gene, overlapping gene, split gene, homoeotic gene, transposon and repetitive DNA.

Concept of genetic code and mechanism of protein synthesis.

Brief idea on methods of gene regulation emphasizing Lac-operon.

Basic idea of Recombinant DNA technology with a concepts of Restriction enzymes, Vector, Marker gene, cloning steps, PCR, genomic DNA and cDNA library.

Brief idea of Bioinformatics including genomics and proteomics.

PAPER-VII: PRACTICAL

PLANT BIOCHEMISTRY

Qualitative tests for organic acids, carbohydrates, proteins and minerals.

Quantitative tests for nitrogen, glucose, acidity, catalase, urease, protein.

PLANT PHYSIOLOGY

Experiments on transpiration, photosynthetic rate determination, chromatography of photosynthetic pigments, respiration rates, osmotic pressure in tissues, effect of temperature on water absorption, and comparative imbibition in different plant tissues.

ANATOMY

Study of microscopic anatomical structures, anomalous secondary growth in stems and roots, and adaptive anatomical features in hydophytes and xerophytes.

PHARMACOGNOSY

Chemical tests for tannins and alkaloids, microscopic study of powdered medicinal plants, histochemical tests for pharmacological substances in medicinal plants.

PAPER-VIII: PRACTICAL

CELL BIOLOGY AND GENETICS

Practical knowledge on chromosome preparation including pretreatment, fixation, staining and mounting for study of mitosis using root tips of *Allium cepa*, *Aloe vera* and *Lens esculenta*.

Study of Meiosis using flower buds of *Allium cepa* and *Setcreasea* sp.

Identification of some normal and abnormal mitotic and meiotic stages from permanent slides.

BIOMETRY

Method of determination of goodness of fit in normal and modified monohybrid and dihybrid ratios using chi-square methods and Univeriate analysis of Statistical data.

MICROBIOLOGY

Practical knowledge on preparation of Bacterial media, sub-culturing and process of normal staining and gram staining of bacterial cell.

PLANT PATHOLOGY

Practical knowledge on preparation of fungal media, isolation of pathogen, inoculation of pathogen and identification of some selected disease and spore of *Puccinia*.

B.Sc. BOTANY (GENERAL)(CBCS)

SEM-I: PLANT DIVERSITY-I

PHYCOLOGY

General account of algae, their classification and role in the environment, agriculture, biotechnology and industry.

Know diagnostic characters of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae with examples along with that life history of *Chlamydomonas*, *Chara* and *Ectocarpus*

MYCOLOGY

Diagnostic characters of fungal subdivisions, common fungi, their economic importance and types.

PHYTOPATHOLOGY

Fundamental concepts of phytopathology, and detailed study of some important plant diseases of potato, rice and jute.

BRYOPHYTES

Unique features of bryophytes, features of the different classes, their ecological and economic importance, and detailed life histories of some common bryophytes.

ANATOMY

Concept and types of stomata, stele, stelar evolution, primary structure of plant organs like stem, root and leaf emphasizing the differences in monocot and dicot.

Concept of normal and secondary growth in stems with the examples of *Tecoma* and *Dracaena*.

PRACTICAL

Workout of common algae and fungi,
Sectioning and staining of plant parts,
Spot identification of algal and fungal structures, pathological specimens.

Local excursion.

SEM-II: PLANT DIVERSITY-II

PTERIDOPHYTES

Diagnostic features of different groups, their economic importance, and life histories of some common pteridophytes.

GYMNOSPERMS

Develop concept about progymosperms, and diagnostic features of Cycadophyta, Coniferophyta and Gnetophyta.

Know life history of *Cycas* and *Pinus*. Reconstructed structure of *Williamsonia*
Economic importance of gymnosperms.

PALEOBOTANY

Fundamental concepts of Paleobotany and its importance, the geological time scale, concepts of Palynology and its applications.

MORPHOLOGY

Fundamentals of different types of Inflorescences, Flower, Fruits and seeds.

TAXONOMY

Introduction on plant taxonomy, and Classificatory system of Angiosperms.

Diagnostic features of some selected families such as Magnoliaceae, Asteraceae, Poaceae, Orchidaceae etc.

PRACTICAL

Knowledge on diagnostic features of some selected families by flower dissection, spot identification of some common plants.

Field excursion.

SEM-III

CELL BIOLOGY AND GENETICS

Basic concepts on the structure and functions of Nucleus, Nucleolus and Chromosome emphasizing the chromosome packaging.

Chromosomal aberration-numerical and structural,

their types, reasons and importance with examples.

Point mutation, types, molecular mechanism and DNA repair.

Concept of genetic code and mechanism of protein synthesis.

Brief idea on Linkage group, Genetic map, Split gene and Transposons.

MICROBIOLOGY

Basic knowledge of Discovery, structure, Replication and Economic importance of Virus and Bacteria, Concepts of T-phage and TMV Virus.

PRACTICAL

Knowledge on chromosome study using onion root tip and bacterial staining.

Identification of different divisional stages and different forms of bacteria from permanent slides.

SEM-IV

PLANT PHYSIOLOGY AND METABOLISM

1. Proteins: Structure of protein and DNA, idea about different types of RNA, classification of enzyme and mechanism of its action.
2. Transport in plants: Brief account on phloem transport, ascent of sap, xylem cavitation and source-sink transport
3. Transpiration: Significance of transpiration and stomatal movement
4. Photosynthesis: General account on pigments, action spectra, enhancement effect, electron transport system, photophosphorylation, C3 and C4 photosynthesis, CAM plants and its significance
5. Respiration: Understand the reactions Glycolysis, Krebs cycle, ETS and oxidative phosphorylation along with significance of glycolysis and krebs cycle
6. Nitrogen metabolism: To develop concept of biological N_2 fixation, reaction of amino acid synthesis
7. Plant Growth regulators: Know physiological roles of Auxin, Gibberellin, Cytokinin, Ethylene and ABA
8. Photoperiodism: Understand different types of photoperiodic plants and role of phytochrome, GA in flowering and Vernalization
9. Senescence: development of brief concept about senescence.

PRACTICAL

1. To understand mechanism of Plasmolysis.
2. To develop concept about transpiration rate per unit leaf area
3. Know imbibition of water using proteinaceous and fatty dry seeds.
4. Understand mechanism of photosynthesis by O_2 evolution.
5. Understand mechanism of aerobic respiration by measuring rate of CO_2 evolution.

B.Sc. PART -3 (GENERAL) (1+1+1)

PAPER – IVA ; MODULE VII

1. Brief idea about sources, production and application of biofertilizer
2. Food value of mushroom and cultivation process of *Pleurotus*
3. General account on quarantine, biological and chemical method of plant disease control
4. Understand plant breeding programme, mass and pure line selection, heterosis and hybrid seed production
5. To know measures of central tendency and goodness of fit
6. Development of concept about plant tissue culture, callus culture and plant regeneration through various ways of tissue culture techniques
7. General account on recombinant DNA technology, cloning and transgenic plants
8. Understand scope and importance of pharmacognosy, secondary metabolites and organoleptic evaluation of drugs.

PRACTICAL

1. To generate concept about laboratory instruments
2. To learn sterilization technique by using autoclave
3. For preparation of culture media of tissue culture method
4. Understand bacterial structure and their cellular details by staining method
5. To have an idea about different medicinally important plants along with their used parts
6. Practical application of Chi-square test for determination of goodness of fit
7. Visit to medicinal plant garden that will enrich student's knowledge in the field of pharmacognosy.

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Program Specific Outcome for B Sc Chemistry Honours

On graduating from the B Sc Chemistry Honours Program (1+1+1 or CBCS curricula) students will be able to appreciate the integral role of Chemistry in our life. A more detailed outcome is given below.

Program Outcomes	The Students would be able to…
PO-1	obtain a firm foundation and in-depth knowledge of concepts, theories and principles of Chemistry
PO-2	use critical thinking and problem- solving skills in all the specific areas of Chemistry
PO-3	design, experiment, analyse data and interpret results with a responsible and ethical scientific temper
PO-4	effectively work in teams, in class or laboratory, with good communication skills, to transmit clear and concise information
PO-5	use modern instrumentation and computers for analysis and computation
PO-6	appreciate the safety and chemical hygiene regulations and practices in laboratory and industry, as the basis for addressing the environmental issues in our society
PO-7	confidently compete in entry level examinations for higher studies or for a career in diverse areas
PO-8	acquire an understanding of the standards of academic discipline and integrity
PO-9	apply the methods of enquiry as professionals or studies in chemistry or other related fields
PO-10	explore new areas of research in chemistry as well as allied science and technology areas

Course Specific Outcome for B Sc Chemistry Honours (1+1+1)

After successful completion of the BSc Chemistry Honours CEMA Program, the students will have an in-depth knowledge of the following specialised areas of the subject. They will be aware of their applications in research and industry, and be ready to put the knowledge to test in their careers and vocations. The specific knowledge areas are outlined below in the column on the right.

Papers	Learning Outcomes	Specific Knowledge Domains Addressed and Achieved by the Student
Paper 1A	LO-1	Stereochemistry of Organic Molecules
	LO-2	Theories of Bonding and Physical Structure
	LO-3	General Understanding of Reaction Mechanisms
	LO-4	Nucleophilic Substitution Reactions
Paper 1B	LO-1	Kinetic Theory and The Gaseous State
	LO-2	Basic Concepts of Thermodynamics and Thermochemistry
	LO-3	Second Law of Thermodynamics, and Concept of Entropy
	LO-4	Chemical Kinetics
Paper 2A	LO-1	Radioactivity and Atomic Structure
	LO-2	Chemical Periodicity
	LO-3	Chemical Bonding and Structure
	LO-4	Acid-Base Reactions
Paper 2B	LO-1	Qualitative Analysis of Inorganic Mixtures
Paper 3A	LO-1	Elctrophilic and Nucleophilic Addition Reactions
	LO-2	Elimination Reactions and Aromatic Substitution
	LO-3	Nitrogen Compounds and Organometallics
	LO-4	Rearrangement Reactions
Paper 3B	LO-1	Thermodynamics and Equilibrium
	LO-2	Liquid State and Viscosity of Fluids
	LO-3	Basic Ideas of Quantum Chemistry
	LO-4	Electrochemistry
Paper 4A	LO-1	Chemical Periodicity and General Property Trends of s- and p-block Elements
	LO-2	Molecular Orbital Theory, Hydrogen Bonding and Metallic Bonding
	LO-3	Chemistry of s- and p- block Elements
	LO-4	Precipitation and Redox Reactions
Paper 4B	LO-1	Analytical Estimations- Iodometry, Permanganometry, Dichromatometry and Complexometry
	LO-2	Instrumental Estimations-Spectrophotometry, Conductometry, Potentiometry, pHmetry

Paper 5	LO-1	Chemistry of Coordination Compounds
	LO-2	Chemistry of d- and f- block Elements
	LO-3	Organometallic Compounds
	LO-4	Major Aspects of Bio-Inorganic Chemistry
	LO-5	Electrochemical and Spectral analysis and Analytical Separations
	LO-6	Statistical Methods in Chemical Analysis and Environmental Analysis
	LO-7	Gravimetric and Titrimetric Methods of Analysis
	LO-8	Thermodynamics of Dissolution
Paper 6A	LO-1	Carbanion Chemistry and Stereochemistry of Cyclic Compounds
	LO-2	UV, IR and NMR Spectroscopy
	LO-3	Synthetic Strategies and Assymetric Synthesis
	LO-4	Carbohydrate Chemistry
	LO-5	Carbocycles and Heterocycles
	LO-6	Amino Acids, Peptides and Nucleic Acids
Paper 6B	LO-1	Spectroscopic Analysis of Organic Compounds
Paper 7A	LO-1	Properties of Solids, Interfaces and Dielectrics
	LO-2	Quantum Chemistry- SH-Oscillator, Schrodinger Equation
	LO-3	Phase Equilibrium and Colligative Properties
	LO-4	Statistical Thermodynamics and the Third Law
	LO-5	Kinetics and Photochemistry
	LO-6	Rotational and Vibrational Spectroscopy and Raman Effect
Paper 7B	LO-1	Non-Instrumental Physical Chemistry Experiments
Paper 8A	LO-1	Qualitative Analysis of Single solid Organic Compounds
	LO-2	Organic Preparations
Paper 8B	LO-1	Instrumental Physical Chemistry Experiments

Course Specific Outcomes for BSc Chemistry Honours (CBCS)

After successful completion of the BSc Chemistry Honours CEMA (CBCS) Program, the students will have an in-depth knowledge of the following areas of the subject. They will be aware of their applications in research and industry, and be ready to put the knowledge to test in their careers and vocations. The specific domains are outlined below in the column on the right.

Semester and Papers	Learning Outcomes	Knowledge Domains Addressed and Attained
Semester I Paper 1 CC1-1	LO-1	Extranuclear Structure of Atom- Quantum Numbers, Scrodinger's Equation, Radial & Angular Distribution
	LO-2	Extranuclear Structure of Atom- Principles, Exchange Energy, Term Symbols
	LO-3	Acid-Base Reactions- Concepts, Thermodynamic Parameters
	LO-4	Acid-Base Reactions- HSAB Principle, Equilibria, Neutralization and Indicators
	LO-5	Redox Reactions- Equations, Potential, Titrations and Indicators
	LO-6	Redox Reactions- Potential Diagrams and Applications
	LO-7	Redox Reactions- Electroanalytical Methods, Applications of Solubility Product and Common Ion Effect
	LO-8	VB Theory **:** Hybridisation, Resonance, DBE and s-cis and s-trans Geometry
	LO-9	Electronic Displacements : Inductive Effect, Mesomeric Effect, Resonance Energy, Bond Polarizability, Electromeric, Field and Steric Effects
	LO-10	MO theory : Concept of HOMO, LUMO and SOMO; Sketch and Energy Levels of π MOs ; Hückel's Rules for Aromaticity , Frost Diagram
	LO-11	Physical properties : BDE and Bond Energy, Distances and Angles, Bond Angle Strain, Polarity and Dipole Moments
	LO-12	Ionic, Radical and Pericyclic Reactions; Addition, Elimination and Substitution Reactions, Bond Cleavage, Electrophiles and Nucleophiles (elementary idea)
	LO-13	Quantitative Acid-Base Titrations and Redox Titrations in the Laboratory
	LO-14	Organic Compounds Separation Based upon Solubility and Common Reagents
Semester I Paper 2 CC1-2	LO-1	Stereochemistry-I: Geometry, Chirality, Symmetry,Configuaration, Optical activity of various organic compds.
	LO-2	Reactive Intermediates of Organic Reactions and their Electrophilic/Nucleophilic Behavior (elementary idea)
	LO-3	Kinetic Theory and Gaseous state: Derivation of Equation for Molecular Distribution with Speed, Equation of States for Real Gas (with reasons for Deviation),Introduction of Heat capacity from Principle of Equipartition of Energy
	LO-4	Transport processes: Understanding of mobility of fluid molecule in Different Conditions: Introduction of Viscosity and

		Diffusion
	LO-5	Chemical kinetics: Concept of Progress of a reaction with Time; Understanding of Rate, Order and Molecularity of a Reaction. Determination of Rate Constant of a Reaction and Understanding of Temperature Dependence of Rate Constant.
	LO-6	Determination of Boiling Point of Common Organic Liquid Compounds
	LO-7	Study of Kinetics and Determination of Rate Constant of Decomposition of H_2O_2
	LO-8	Study of Kinetics and Determination of Rate Constant for Acid-catalyzed Hydrolysis of Methyl Acetate
	LO-9	Study of Viscosity and Determination of Viscosity Coefficient of Unknown Liquid with Respect to Water
	LO-10	Understanding of Concentration Dependence of Viscosity.
	LO-11	Understanding of Solubility of Sparingly Soluble Salt in Water, and Effect of Common ion on solubility
Semester II Paper 3 CC2-3	LO-1	Stereochemistry-II: Concept of Stereoisomerism, Pro-Stereoisomerism, Conformational Analysis
	LO-2	Reaction mechanism-III: Organic Reaction Kinetics, Thermodynamics, Tautomerism, Substitution and Elimination Reactions
	LO-3	Organic Compounds Preparation, Purification and Melting Point Determination
Semester II Paper 4 CC2-4	LO-1	Ionic Bonding- Characteristics, Size Effects, Crystal Packing
	LO-2	Ionic Bonding- Born-Lande Equation, Born Haber Cycle, Energetics
	LO-3	Covalent Bond-Polarization, Formal Charge, VBT
	LO-4	Covalent Bond-Hybridisation, VSEPR Theory, Molecular Shapes
	LO-5	MOT-LCAO, Mo Diagrams of Homonuclear and Heteronuclear Species
	LO-6	Metallic Bond, Semiconductors and Insulators, Weak Chemical Forces
	LO-7	Nuclear Stability and Forces (Theories and Models), Artificial Radioactivity
	LO-8	Fission, Fusion, Spallation, Nuclear Energy, Radiochemical Methods, Hazards and Safety Measures
	LO-9	Iodo/i- metric Titrations, Estimation of Metal Content in Select Samples
Semester III Paper 5 CC3-5	LO-1	Chemical Thermodynamics I: Introduction of Systems, Different Thermodynamic Functions (State/Path) , Properties (Intensive/Extensive), Parameters (Internal Energy, Enthalpy), Introduction of 1^{st} Law: Mathematical relation of Heat and Work, Determination of Molar Heat capacities (C_p, C_v)
	LO-2	Understanding of 2^{nd} Law of Thermodynamics. Introduction of Entropy: Degree of Disorderness of a System, Determination of Functions (Helmholtz free Energy/Gibbs free Energy) to Understand the Direction/ Spontaneity of Reaction

	LO-3	Determination of Different Thermodynamic Parameters for Open System: Introduction of Chemical Potential
	LO-4	Understanding of Chemical Equlibrium, Determination of Equlibrium Constant and its Dependence on Parameters
	LO-5	Understanding of Conductance of Strong and Weak Electrolytes, Dependence of Conductance on Concentration, Ionic Mobility, Understanding of Hydrolysis of Weak electrolytes, Determination of Dissociation Constant, Salt Hydrolysis, Buffers and pH. Construction of Cell, Understanding of Electromotive Force Determination of Redox Potential for Different Systems
	LO-6	Conductometric Titrations of Acid vs Strong Base, Determination of Strength of Acid, Base, Mixture of acids
	LO-7	Study of Saponification Reaction Conductometrically, Determination of Rate Constant for Hydrolysis of Ester Using Base as Catalyst
	LO-8	Verification of Ostwald's Dilution Law and Determination of Ka of Weak Acid, Determination of Dissociation Constant for a Weak Acid
	LO-9	Potentiometric Titration of Mohr's Salt Solution Against Standard $K_2Cr_2O_7$ and $KMnO_4$ Solution, Determination of Standard Reduction Potential Value for $Fe3^+/Fe2^+$ System
	LO-10	Determination of K_{sp} for AgCl by Potentiometric Titration of $AgNO_3$ Solution Against Standard KCl Solution, Understanding of Solubility Product for a Sparingly Soluble Salt
	LO-11	Determination of Heat of Neutralization of a Strong Acid by a Strong Base, Understanding of Enthalpy Change for a Acid-Base Titration and Determination of Heat of Neutralisation
Semester III Paper 6 CC3-6	LO-1	Modern Periodic Table, Radii, IP,EA, Electronegativity and Their Group Trends,
	LO-2	Secondary Periodicity, Relativistic and Inert Pair Effects
	LO-3	Chemistry of s- block Elements, Structure, Bonding, Preparation and Properties of Typical Compounds
	LO-4	Chemistry of p- block Elements, Structure, Bonding, Preparation and Properties of Typical Compounds
	LO-5	Noble Gases- Inertness, Occurrence, Uses, Compounds, Bonding and Structure (VSEPR)
	LO-6	Inorganic Polymers-Types, Syntheses, Structure and Applications
	LO-7	Coordinate Compounds,Werner's Theory, IUPAC Nomenclature, Isomerism
	LO-8	Complexometric Titrations of Cations, Hardness of Water in Laboratory
	LO-9	Paper Chromatographic Separation of Metal Ions in Laboratory
Semester III Paper 7 CC3-7	LO-1	Chemistry of alkenes and alkynes: Addition to C=C and C≡C Bonds
	LO-2	Aromatic Substitution: Electrophilic and Nucleophilic

		Aromatic Substitution reaction.
	LO-3	Carbonyl and Related Compounds: Addition to C=O and α,β-Unsaturated Carbonyl System
	LO-4	Organometallics reagents: Preparation and Reactions of GrignardReagents, Organolithiums, Gilman Cuprates, Organocopper Reagents; Concept of Umpolung
	LO-5	Identification of Pure Solid & Liquid Organic Compounds; Quantitative Estimations of Organic Compounds in Laboratory
Semester III Paper 8 SEC-A2	LO-1	Carbohydrates & Proteins: Biological importance, Metabolism,Isolation and Characterization, α-helix and β-pleated Sheets, Denaturation of Proteins
	LO-2	Enzymes: Nomenclature, Characteristics, Active Site, Mechanism of Action, Stereospecificity, Coenzymes and Cofactors, Enzyme Inhibitors
	LO-3	Lipids: Classification, Biological Importance, Lipid membrane, Liposomes and Their Biological Functions
	LO-4	Lipoproteins: Biochemistry of Peptide Hormones, DNA and RNA Structure, Genetic Code, DNA and RNA- Replication, Transcription and Translation, Introduction to Gene Therapy
	LO-5	Diagnostic Approach of Blood/Urine Analysis: *Blood:* Collection and Preservation, Anaemia, Blood Sugar, Urea, Creatinine, Cholesterol and Bilirubin *Urine:* Collection and Preservation, Normal and Pathological Urine.
	LO-6	Hands On Practical: Identification of Carbohydrates, Proteins & Lipids, Determination of Saponification Number of Oil, Cholesterol, Nucleic Acids
Semester IV Paper 9 CC4-8	LO-1	Aliphatic & Aromatic Amines, Nitro Compounds, Alkylnitrile, Isonitrile, Diazonium Salts and Their Related Compounds
	LO-2	Aliphatic and Aromatic Rearrangement Reactions
	LO-3	Retrosynthetic Analysis, Strategy of Ring Synthesis, Asymmetric Synthesis
	LO-4	Spectroscopy (UV,IR,NMR)
	LO-5	Qualitative Analysis of Single Solid Organic Compounds
	LO-6	Preparation, Purification and Melting Point Determination of a Given Organic Compound
Semester IV Paper 10 CC4-9	LO-1	Concepts of Colligative Properties of Ideal Solutions,Raoults Law, Deviation from Ideal Behaviour Concept of Phase, Component, Degrees of Freedom, Derivation of Mathematical Formula for Determining Different Thermodynamic Parameters for Multicomponent System
	LO-2	Foundation of Quantum Mechanics: Introduction, The Fallacy of Classical Mechanics Defining a System Through the Introduction of Wave Function Determination of Parameters Regarding a System by introduction of Operators. Setting of Schrodinger Equation for Particle In a Box and Determination of Energy for Different States

	LO-3	Crystal Structure, Idea of Structure of Solids,Planes, Angles for Crystals, Various Lattice Structures Determination of Heat Capacity of Solids
	LO-4	Kinetic Study of Inversion of Cane Sugar using a Polarimeter: Understanding of Polarisation of light, Plane Polarised Light, Inversion of Sugar,Determination of Rate Constant for Inversion of Cane Sugar.
	LO-5	Study of Phase Diagram of Phenol-Water system: Determination of the Critical Solution Temperature
	LO-6	Determination of Partition Coefficient for the Distribution of I_2 Between Water and CCl_4: Understanding of Nernst Distribution Law,Determination of Distribution Coefficient
	LO-7	Determination of pH of Unknown Solution (buffer) by Colour Matching Method: Understanding Dissociation of Indicators and Production of Colour Depending on pH
	LO-8	pH-metric Titration of Acid (mono- and di-basic) Against Strong Base: Determination of pKa and Dissociation Constant (K_a) for Mono and Di-basic Acid
	LO-9	pH-metric Titration of a Tribasic Acid Against Strong Base: Determination of pKa and Dissociation Constant (K_a) for Tribasic Acid
Semester IV Paper 11 CC4-10	LO-1	VBT of Coordination Compounds, CFT , CFSE, Jahn-Teller Distortion
	LO-2	MOT of Coordination Compounds, Magnetism and Colour
	LO-3	L-S Coupling, Orgel Diagrams, CT-Spectra, Selection Rules, Spectrochemical Series
	LO-4	Comparative Study of 3d-, 4d-, 5d- Elements
	LO-5	Comparative Study of Lanthanoids and Actinoids, Lanthanide Contraction, Ion-Exchange Separation for Lanthanoids
	LO-6	Inorganic Reaction Mechanisms, Trans Effect- Theory and Application
	LO-7	Thermodynamic and Kinetic Stability in Complexes, Kinetics and Reaction Rates
	LO-8	Inorganic Preparations of Coordination Compounds in Laboratory
	LO-9	Spectrophotometric Techniques of Measuring 10Dq and λmax of Complexes
Semester IV Paper 12 SEC-B3	LO-1	Drug Discovery, Design, Development, Retrosynthetic Approach
	LO-2	Synthesis of Analgesics, Antipyretics and Anti- inflammatory Agents
	LO-3	Synthesis of Antibiotics, Antifungals, Antivirals
	LO-4	Synthesis of CNS Agents, Cardiovascular, Anti-Leprosy and HIV Drugs
	LO-5	Fermentation Process - Applications in Commercial Productions of Vitamins, Antibiotics and Industrial Raw Material

Program Specific Outcome of BSc Chemistry General
On graduating from the B Sc Chemistry General Program (1+1+1 or CBCS curricula) students will be able to appreciate the integral role of Chemistry in our life, some details of which are given below.
The Students would be able to…
• obtain a firm foundation and in-depth knowledge of concepts, theories and principles of Chemistry
• learn critical thinking and problem- solving skills and apply the wherever required
• develop a responsible and ethical scientific temper for team work
• develop good communication skills, to transmit clear and concise information whenever necessary
• follow safety and chemical hygiene regulations and practices in laboratory and industry,with environmental awareness
• confidently compete in entry level examinations for higher studies or for a career in diverse areas
• acquire an understanding of the standards of academic discipline and integrity

Course Specific Outcomes for BSc Chemistry General (1+1+1)

After successful completion of the BSc Chemistry General CEMG Program, the students will have an in-depth knowledge of the following areas of the subject. They will be aware of their applications in research and industry, and be ready to put the knowledge to test in their careers and vocations. The specific domains are outlined below in the column on the right.

Papers	Learning Outcomes	Knowledge Domains Addressed
Paper 1	LO-1	Radioactivity and Nuclear Structure, Extranuclear Atomic Structure, Chemical Periodicity
	LO-2	The Principles of Organic Qualitative Analysis
	LO-3	Electronic Effects, Stereochemistry, Aliphatic and Aromatic Hydrocarbons
	LO-4	Aldehydes and Ketones, Alkyl and Aryl Halides
	LO-5	Ionic, Covalent and Coordinate Bonding, Basic Coordination Chemistry
	LO-6	Comparative Study of p-block Elements
	LO-7	Carboxylic Acids and Phenols, Organometallic Compounds, Organic Compounds Containing Nitrogen
	LO-8	Carbohydrates, Amino Acid and Proteins
Paper 2	LO-1	The Gaseous State and The Liquid State
	LO-2	Chemical Kinetics and Catalysis
	LO-3	Principles of Qualitative Inorganic Analysis
	LO-4	Comparative Study of s-block Elements, Metallurgy and Related Processes
	LO-5	Thermodynamics- Basic Concepts, First and Second Laws
	LO-6	Chmical Equilibrium and Colloids
	LO-7	Acids, Bases and Solvents, Electrolytic Conductance
	LO-8	Electrochemistry and Potentials, Colligative Properties of Non-electrolytes
Paper 3	LO-1	Qualitative Analysis of Single Organic Compounds
	LO-2	Qualitative Analysis of Inorganic Salt Mixtures
Paper 4	LO-1	Concepts and Applications of Gravimetric and Volumetric Analysis
	LO-2	Error Analysis and Computr Applications in Chemistry
	LO-3	Industrial Chemistry of Fuels, Fertilizers, Glass and Ceramics
	LO-4	Industrial Chemistry of Polymers, Paints, Varnishes and Synthetic Dyes, Drugs and Pharmaceuticals
	LO-5	Environmental Chemistry of the Atmosphere, Hydrosphere and Lithosphere
	LO-6	Industrial Chemistry of Fats, Oils and Detergents, Pesticides, Food Additives
	LO-7	Quantitative Estimations of Acid/ Base Mixtures, Water Hardness and Determination of Simple Physical Parameters

Course Specific Outcomes for BSc Chemistry General (CBCS)

After successful completion of the BSc Chemistry General CEMG (CBCS) Program, the students will have an in-depth knowledge of the following areas of the subject. They will be aware of their applications in research and industry, and be ready to put the knowledge to test in their careers and vocations. The specific domains are outlined below in the column on the right.

Semester and Papers	Learning Outcomes	Knowledge Domains Addressed
Semester I	LO-1	Kinetic Theory of Gases and Real Gases
	LO-2	Liquids -Definition and Properties
	LO-3	Chemical Kinetics- concepts and Rate Laws
Paper 1	LO-4	Atomic Structure- Concepts, Models and Configurations
CC1/GE1	LO-5	Chemical Periodicity, Trends and Characteristics of s-,p-, d-,f- Elements
	LO-6	Acids and Bases- Concepts and Applications
	LO-7	Electronic Displacements in Organic Chemistry
	LO-8	Stereochemistry in Organic Chemistry
	LO-9	Nucleophilic Substitution and Elimination Reactions
	LO-10	Quantitative Estimations – Acid/Base Titrations, Permanganometry, Dichromatometry
Semester II	LO-1	Chemical Thermodynamics- Enthalpy, Entropy and Second Law
	LO-2	Chemical Equilibrium- Concepts and Principles
	LO-3	Solutions-Ideal and Non-ideal
Paper 2	LO-4	Phase Equilibria- Concepts and Phase Diagrams
CC2/GE2	LO-5	Solids-Concepts, Laws of Crystallography
	LO-6	Aliphatic Hydrocarbons- Alkanes, Alkenes and Alkynes
	LO-7	Error Analysis and Computer Applications in Chemistry
	LO-8	Redox Reactions- Equations, Potential, Titration and Indicators
	LO-9	Experimental Study of Physical Parameters in/of Solutions
Semester III	LO-1	Chemical Bonding (Ionic, Covalent) and Molecular Structure (MOT)
	LO-2	Comparative Study of p-Block Elements
	LO-3	Transition elements- Characteristic s of 3d-, Lanthanoids and Actinoids
	LO-4	Coordination Chemistry- Salient Features and Drawbacks of VBT
Paper 3	LO-5	Ionic Equilibria- Concepts and Applications
CC3/GE3	LO-6	Conductance- Principles, Laws and Applications
	LO-7	Electromotive Force-Cells, Potentiometric Titrations
	LO-8	Aromatic Hydrocarbons
	LO-9	Organometallic Compounds and Aryl Halides
	LO-10	Qualitative Semimicro Analysis of Inorganic Mixtures
Semester III	LO-1	Sampling, Accuracy, Precision, Error and Experimental Data Analysis
	LO-2	Analysis of Soil-Composition and Parameters
	LO-3	Analysis of Water-Definition, Sampling and Purification Methods
	LO-4	Analysis of Food Products- Nutritional Value, Food Processing, Preservation and Adulteration
Paper 4	LO-5	Chromatography- Principles, Paper and TL- techniques
SEC-A1	LO-6	Ion-Exchange-Principles and Resins

	LO-7	Analysis of Cosmetics- Constituents and Functions
	LO-8	Application and Instrumental Techniques- in Food& Beverage, Medicines etc
Semester IV Paper 5 CC4/GE4	LO-1	Alcohols, Phenols and Ethers
	LO-2	Carbonyl Compounds
	LO-3	Carboxylic Acids and Derivatives
	LO-4	Amines and Diazonium Salts
	LO-5	Amino Acids and Carbohydrates
	LO-6	Crystal Field Theory- Tetrahedral and Octahedral Symmetry
	LO-7	Quantum Chemistry and Spectroscopy
	LO-8	Qualitative Analysis of Single Solid Organic Compound
	LO-9	Identification of Pure Organic Compounds
Semester IV Paper 6 SEC-B3	LO-1	Drug Discovery, Design, Development, Retrosynthetic Approach
	LO-2	Synthesis of Analgesics, Antipyretics and Anti- inflammatory Agents
	LO-3	Synthesis of Antibiotics, Antifungals, Antivirals
	LO-4	Synthesis of CNS Agents, Cardiovascular, Anti-Leprosy and HIV Drugs
	LO-5	Fermentation Process - Applications in Commercial Productions of Vitamins, Antibiotics and Industrial Raw Material
Semester V Paper 7 SEC-A2	LO-1	Carbohydrates-Biological Importance and Cell Energetics
	LO-2	Proteins and Enzymes- Classification, Nomenclature, Structure,Functions
	LO-3	Lipids, Lipoproteins and Hormones- Classification, Importance, Biochemical Functions
	LO-4	DNA Structure and Role, Role of RNA, The Genetic Code and Gene Therapy
	LO-5	Biochemistry of Disease- Diagnostic Approach with Blood and Urine Analysis
Semester V Paper 8 DSE-A1	LO-1	Synthesis and Modification of Inorganic Solids
	LO-2	Inorganic Solids of Technological Importance
	LO-3	Nanomaterials and Bionanocomposites- Overview and Preparations
	LO-4	Engineering Materials for Mechanical Construction
	LO-5	Composite Materials- Classification, Environmental Effects, Applications
	LO-6	Speciality Polymers- Classification, Properties, Manufacturing, Applications
	LO-7	Cation Exchange and TDS Processes in Laboratory
	LO-8	Synthesis of Hydrogels and Nanoparticles in Laboratory
Semester VI Paper 9 SEC-B4	LO-1	Pesticides- Natural and Synthetic, Benefits and Adverse Effects
	LO-2	Pesticides- Structure –Activity Relationship
	LO-3	Synthesis, Manufacture, Use of Organochlorines and Organophosphates
	LO-4	Synthesis, Manufacture, Use of Carbamates, Quinones, Anilides
Semester VI	LO-1	Green Chemistry- Introduction, Goals and Limitations
	LO-2	Green Chemistry-Principles, Designing Syntheses and Atom Economy
	LO-3	Green Chemistry-Minimising Toxicity and Hazardous Products

Paper 10 DSE-B1	LO-4	Green Solvents, Use of Alternative Energy Sources and Catalytic Reagents
	LO-5	Examples of Green Syntheses of Compounds
	LO-6	Microwave and Ultrasound Assisted Reactions
	LO-7	Green Approach to Common Organic Reactions and Rearrangement Reactions
	LO-8	Future Trends-Catalysts, Biomimetic and Multifunctional Reagents, etc Green Chemistry in sustainable Development
	LO-9	Alkaloids and Terpenes- Natural Occurrence, Structure, Classification,Isolation and Syntheses
	LO-10	Green Reactions in the Laboratory

Netaji Nagar College for Women, Kolkata-92
Department of Economics

Name of the Programme: Economics (Hon.)
Level: U.G.
C.B.C.S. Degree Programme: B.Sc Degree Course

PROGRAMME OUTCOMES (POs):

PO 1. Students will be able analyse the human behaviour, problems & solutions of different aspects of social sciences in cross cultural and global perspectives.
PO 2. Students will be able to evaluate how economic theories and models within social sciences have been established and maintained through systems of power and oppression.
PO 3. Students will be able to forecast the future course of changes and development through their knowledge and set different policies of government and other agencies.
PO 4. Students will be able to understand the economic conditions of an economy

PROGRAMME SPECIFIC OUTCOMES (PSOs):

After graduation the student will be able to learn -

PSO 1. The behavioural pattern of different economic agents, advance theoretical issues and their applications.
PSO 2. To expose the basic concepts of microeconomics and macroeconomic theory.
PSO 3. To equip with mathematical, statistical and econometric tools to analyze economic problems.
PSO 4. To formally analyze the theory of consumer behaviour , producer behaviour, markets, factor pricing , cost structure and revenue through advanced microeconomic theory .
PSO 5. To make students understand the long run dynamic issues like growth and technical progress.
PSO 6. To familiarize students to the basic concepts and theories of international trade, determinants, and dynamic effects of trade policies.
PSO 7. To make the students understand the functioning of banks , monetary and financial sectors of the economy, role of financial markets and Institutions , budget and balance of payments.
PSO 8. To expose the students to various economic problems and issues related to growth, development, sustainable development, environment with special reference to India.
PSO 9. To acquaint yourself with some basic mathematical and statistical methods to be applied in economics.
PSO 10. To acquaint themselves with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities with Indian perspectives.
PSO 11. To facilitate the historical developments in the economic thoughts propounded by different schools.
PSO 12. To learn the basic concept of monetary analysis and financial marketing in Indian financial markets and to learn the development issues of the Indian economy.
PSO 13. To acquaint themselves with some basic concepts of environmental economics along with the solution of the environmental problems.
PSO 14. To learn the real and monetary sides of International economics

Netaji Nagar College for Women, Kolkata-92

Department of Economics

Course Outcome of Economics (Hon.)

C.B.C.S. Degree Programme: B.Sc Degree Course

Sl	Semester	Course Code ECOA	Course Name	Course Outcome (COs) *After the successful completion of the course a student will be able -*
1.	Sem-I (July To December)	CC-1-1	Introductory Microeconomics Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To understand the basic subject matter of Economics ***CO 2***. To understand how the markets work through demand and supply; ***CO 3***. To identify the various determinants of firms' demand for factor services; market equilibrium. ***CO 4***. To enable the students to apply the theories in analysing the micro issues of the real world. ***CO 5***. To analyse the role of government intervention
		CC-1-2	Mathematical Methods for Economics - I Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. The main outcome is to learn mathematical tools of economics through single variable optimization technique ***CO 2***. Application of mathematical techniques in economic theory like integration of functions. ***CO 3***. To understand the role of matrix algebra ***CO 4***. To understand and apply the role of game theory in economics
2.	Sem-II (January to June)	CC-2-3	Introductory Macroeconomics Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To understand the basic components of national Income and NI accounting ***CO 2***. To understand the effects on NI due to a change in different macro variables *CO 3*. To suggest different macroeconomic policies to solve the macro problems of an economy ***CO 4***. To understand the simple Keynesian model in a closed economy ***CO 5***. To know about the classical system of macroeconomics ***CO 6***. To understand the macroeconomic foundations like investment function
		CC-2-4	Mathematical methods for Economics - II Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To understand the behavioural pattern of several variables ***CO 2***. To apply the multivariable optimizations ***CO 3***. To apply the mathematical approach in micro and macro dimensions through difference equations and differential equations.
3.	Sem-III (July To December)	CC-3-5	Intermediate Microeconomics - I Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To understand the behavioural pattern of consumers and applications of producers. ***CO 2***. To learn the decision making process of different market structures. ***CO 3***. To deal with the advance theoretical issues and their practical applications of input market
		CC-3-6	Intermediate Macroeconomics - I Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To analyse the National Income determination in the Short run through IS-LM model ***CO 2***. To understand the concepts of aggregate demand and aggregate supply of Complete Keynesian model ***CO 3***. To get ample knowledge about monetary policy and government budgetary operations. ***CO 4***. To analyse the roots of inflation, unemployment and expectations
		CC-3-7	Statistical Methods for Economics Futll Marks - 100, Credit - 6 (Th: 5 + Tu:1)	***CO 1***. To apply the descriptive statistics ***CO 2***. To understand elementary probability theory and probability distributions ***CO 3***. To construct sample design ***CO 4***. To draw statistical inference

		SEC-3-1-A	**Rural Development** **Full Marks - 100, Credit-2**	***CO 1***. To understand different aspects of rural development ***CO 2***. To know about Panchayats ***CO 3***. To analyse the rural credit system and the role of Self help Groups ***CO 4***. To evaluate critically the Government programes
4.	**Sem-IV** **(January to June)**	**CC-4-8**	**Intermediate Microeconomics - II** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the functioning of imperfect market structure ***CO 2***. To get full knowledge about the input market behaviour under imperfect competition ***CO 3***. To analyse the general equilibrium, efficiency and welfare.
		CC-4-9	**Intermediate Macroeconomics - II** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the basic tenets of New classical and New Keynesian theories ***CO 2***. To understand the macroeconomic foundations like consumption and demand for money ***CO 3***. To analyse the growth models in development economics.
		CC-4-10	**Introductory Econometrics** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To get the idea about the nature and scope of econometrics ***CO 2***. To understand the classical linear regression model and the applications. ***CO 3***. To understand the multiple linear regression model ***CO 4***. To know about statistical inference in linear regression model and violations of classical assumptions
		SEC-4-2-B	**Managerial Economics** **Full Marks - 100, Credit - 2**	***CO 1***. To understand the break-even analysis, pricing policies. ***CO 2***. To acquire ample knowledge about capital budgeting. ***CO 3***. To understand the fundamentals of cost of capital . ***CO 4***. To apply the method of inventory management.

Netaji Nagar College for Women, Kolkata-92
Department of Economics

Name of the Programme: Economics (Gen.)
Level: U.G.
C.B.C.S. Degree Programme: B.A. Degree Course

PROGRAMME OUTCOMES (POs):

PO 1. Students will be able analyse the human behaviour, problems & solutions of different aspects of social sciences in cross cultural and global perspectives.
PO 2. Students will be able to evaluate how economic theories and models within social sciences have been established and maintained through systems of power and oppression.
PO 3. Students will be able to forecast the future course of changes and development through their knowledge and set different policies of government and other agencies.
PO 4. Students will be able to understand the economic conditions of an economy

PROGRAMME SPECIFIC OUTCOMES (PSOs):

After graduation the student will be able to learn -

PSO 1. The behavioural pattern of different economic agents, advance theoretical issues and their applications.
PSO 2. To expose the basic concepts of microeconomics and macroeconomic theory.
PSO 3. To formally analyze the theory of consumer behaviour , producer behaviour, markets, factor pricing , cost structure and revenue through advanced microeconomic theory .
PSO 4. To familiarize students to the basic concepts and theories of international trade, determinants, and dynamic effects of trade policies.
PSO 5. To make the students understand the functioning of banks , monetary and financial sectors of the economy, role of financial markets and Institutions , budget and balance of payments.
PSO 6. To expose the students to various economic problems and issues related to growth, development, sustainable development, environment with special reference to India.
PSO 7. To acquaint themselves with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities with Indian perspectives.
PSO 8. To facilitate the historical developments in the economic thoughts propounded by different schools.
PSO 9. To acquaint themselves with some basic concepts of environmental economics along with the solution of the environmental problems.
PSO 10. To learn the real and monetary sides of International economics

Netaji Nagar College for Women, Kolkata-92

Department of Economics

Course Outcome of Economics (Gen.)

C.B.C.S. Degree Programme: B.A. Degree Course

Sl	Semester	Course Code ECOG	Course Name	Course Outcome (COs) *After the successful completion of the course a student will be able -*
1.	**Sem-I** **(July To December)**	**CC-1-1 / GE-1-1**	**Introductory Microeconomics** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the basic subject matter of Economics ***CO 2***. To understand how the markets work through demand and supply and welfare ***CO 3***. To identify the various determinants of household behaviour ***CO 4***. To enable the students to understand the nature of firm and perfect market structure ***CO 5***. To analyse the imperfect market structure **CO 6**. To understand the idea of input market
2.	**Sem-II** **(January to June)**	**CC-2-2 / GE-2-2**	**Introductory Macroeconomics** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the basic components of national Income and NI accounting ***CO 2***. To understand the effects on NI due to a change in different macro variables *CO 3*. To suggest different macroeconomic policies to solve the macro problems of an economy ***CO 4***. To understand the simple Keynesian model in a closed economy ***CO 5***. To know about the classical system of macroeconomics ***CO 6***. To understand the macroeconomic foundations like money demand and money supply. **CO 7.** To understand the types, impact of inflation **CO 8.** To acquaint themselves with the external sector
3.	**Sem-III** **(July To December)**	**CC-3-3 / GE-3-3**	**Issues in Economic Development and India** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the basic idea of economic development ***CO 2***. To learn about the meaning and measurement of poverty and inequality ***CO 3***. To deal with the idea of dual economy and development strategies ***CO 4***. To get the idea about the functions of international organizations like IMF, World Bank and WTO
4.	**Sem-IV** **(January to June)**	**CC-4-4 / GE-4-4**	**Indian Economic Policies** **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. To understand the macroeconomic policies and their impact on Indian economy ***CO 2***. To get full knowledge about the policies and performance in agriculture ***CO 3***. To analyse the policies and performance in industry ***CO 4***. To analyse the policies and performance of Indian foreign trade.

Netaji Nagar College for Women, Kolkata-92
Department of Economics

Name of the Programme: Economics (Hon.)
Level: U.G.
Three-Year Degree Courses of Studies (1+1+1): B.Sc Degree Course

PROGRAMME OUTCOMES (POs):

PO 1. Students will be able analyse the human behaviour, problems & solutions of different aspects of social sciences in cross cultural and global perspectives.
PO 2. Students will be able to evaluate how economic theories and models within social sciences have been established and maintained through systems of power and oppression.
PO 3. Students will be able to forecast the future course of changes and development through their knowledge and set different policies of government and other agencies.
PO 4. Students will be able to understand the economic conditions of an economy

PROGRAMME SPECIFIC OUTCOMES (PSOs):

After graduation the student will be able to learn -

PSO 1. The behavioural pattern of different economic agents, advance theoretical issues and their applications.
PSO 2. To expose the basic concepts of microeconomics and macroeconomic theory.
PSO 3. To equip with mathematical, statistical and econometric tools to analyze economic problems.
PSO 4. To formally analyze the theory of consumer behaviour , producer behaviour, markets, factor pricing , cost structure and revenue through advanced microeconomic theory .
PSO 5. To make students understand the long run dynamic issues like growth and technical progress.
PSO 6. To familiarize students to the basic concepts and theories of international trade, determinants, and dynamic effects of trade policies.
PSO 7. To make the students understand the functioning of banks , monetary and financial sectors of the economy, role of financial markets and Institutions , budget and balance of payments.
PSO 8. To expose the students to various economic problems and issues related to growth, development, sustainable development, environment with special reference to India.
PSO 9. To acquaint yourself with some basic mathematical and statistical methods to be applied in economics.
PSO 10. To acquaint themselves with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities with Indian perspectives.
PSO 11. To facilitate the historical developments in the economic thoughts propounded by different schools.
PSO 12. To learn the basic concept of monetary analysis and financial marketing in Indian financial markets and to learn the development issues of the Indian economy.
PSO 13. To acquaint themselves with some basic concepts of environmental economics along with the solution of the environmental problems.
PSO 14. To learn the real and monetary sides of International economics

Netaji Nagar College for Women, Kolkata-92
Department of Economics
Course Outcome of Economics (Hon.)
Three Year Deegree Programme (1+1+1): B.A. Degree Course

Year	Paper no.	Paper Name (Marks-50)	Course Outcomes After the successful completion a student can able to learn/understand/ identify/ acquaint themselves with --
3rd	V-A	International Economics	CO 1. The basic models of international trade CO 2. The comparative advantage and income distribution of the trading partners CO 3. The standard trade models CO 4. The role of trade policies CO 5. The methods of income determination and exchange rate
	V-B	Public Finance	CO 1. The idea of public economics CO 2. The focus and functions of government CO 3. The idea of federal finance CO 4. The idea of public good and public sector CO 5. The importance and making of government budget and policy CO 6. The idea of revenue resources CO 7. The tax structure CO 8. The idea of distribution and stabilisation
	VI-A	Comparative Development Experience	CO 1. The idea of international comparisons of development CO 2. The genesis of capitalism CO 3. The industrialisation experiences in early part of 20th century CO 4. Development and underdevelopment as a historical process CO 5. The idea of evolution of new international economic order CO 6. The concepts of development policies and role of the state CO 7. Can analyse some recent development experiences like China, Africa and Argentina
	VI-B	Comparative Economic Issues: India & West Bengal	CO 1. The idea of economic reforms in India since 1991 CO 2. To analyse the post reform performance of Indian economy CO 3. To know the current and future issues of Indian economy CO 4. The acquire some idea of West Bengal economy CO 5. The growth & development of WB economy
	VII-A	Statistics & Basic Econometrics	CO 1. The idea of joint probability distribution CO 2. The concept of sampling theory & sampling distribution CO 3. The idea of statistical inference CO 4. The application of elementary econometrics CO 5. The role and uses of time series data
	VII-B	Managerial Economics	CO 1. The nature and scope of managerial economics CO 2. The break-even analysis CO 3. The idea of organisational design & principal-agent analysis CO 4. The pricing policies and practices CO 5. The need, steps, nature and methods of capital budgeting CO 6 . the role of cost of capital and inventory management CO 7. The role of corporate governance
	VIII-A	Indian Economic History	CO 1. The economic condition in India on the eve of british rule CO 2. Different aspects of economic policies in british rule CO 3. The impact of british rule CO 4. The early economic planning initiatives during british rule
	VIII-B	Term Paper	CO 1. The method of preparation CO 2. The method of writing

Netaji Nagar College for Women, Kolkata-92
Department of Economics

Name of the Programme: Economics (Gen.)
Level: U.G.
Three Year Deegree Programme (1+1+1): B.A. Degree Course

PROGRAMME OUTCOMES (POs):

PO 1. Students will be able analyse the human behaviour, problems & solutions of different aspects of social sciences in cross cultural and global perspectives.
PO 2. Students will be able to evaluate how economic theories and models within social sciences have been established and maintained through systems of power and oppression.
PO 3. Students will be able to forecast the future course of changes and development through their knowledge and set different policies of government and other agencies.
PO 4. Students will be able to understand the economic conditions of an economy

PROGRAMME SPECIFIC OUTCOMES (PSOs):

After graduation the student will be able to learn -

PSO 1. The behavioural pattern of different economic agents, advance theoretical issues and their applications.
PSO 2. To expose the basic concepts of microeconomics and macroeconomic theory.
PSO 3. To formally analyze the theory of consumer behaviour , producer behaviour, markets, factor pricing , cost structure and revenue through advanced microeconomic theory .
PSO 4. To familiarize students to the basic concepts and theories of international trade, determinants, and dynamic effects of trade policies.
PSO 5. To make the students understand the functioning of banks , monetary and financial sectors of the economy, role of financial markets and Institutions , budget and balance of payments.
PSO 6. To expose the students to various economic problems and issues related to growth, development, sustainable development, environment with special reference to India.
PSO 7. To acquaint themselves with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities with Indian perspectives.
PSO 8. To facilitate the historical developments in the economic thoughts propounded by different schools.
PSO 9. To acquaint themselves with some basic concepts of environmental economics along with the solution of the environmental problems.
PSO 10. To learn the real and monetary sides of International economics

Netaji Nagar College for Women, Kolkata-92
Department of Economics
Course Outcome of Economics (General.)

Three Year Deegree Programme (1+1+1): B.A. Degree Course

Year	Paper no.	Paper Name (Marks-100)	Course Outcomes After the successful completion a student can able to learn/understand/ identify/ acquaint themselves with --
3rd	IV-A	**Development Economics (Marks-50)**	CO 1. The difference / distinction between growth & development CO 2. The role of development planning CO 3. The correlation between population and economic development CO 4. The different forms of foreign investment and its role in economic development CO 5. The role of IMF and IBRD in economic development of LDCs CO 6. The different ideas of gender related issues.
	IV-B	**Group-A** **International Economics (Marks-25)**	CO 1. The idea of basis of trade and terms of trade CO 2. The idea of absolute and comparative advantage CO 3. The idea protection and infant industry arguments CO 4. The idea of tariff and quota CO 5. The arguments for and against free trade and protection CO 6. The idea of balance of trade and balance of payments CO 7. The current and capital account of BOP and equilibrium CO 8. The idea of foreign exchange rate
		Group - B **Statistics (Marks-25)**	CO 1. The idea of data classification and presentation CO 2. The statistical data analysis CO 3. The measures of central tendency like mean, median and mode CO 4. The measures of dispersion like mean and standard deviation CO 5. The idea of Lorentz curve / curve of concentration CO 6. The concepts of measurement of economic inequality

Netaji Nagar College for Women

Department of Education

Programme Specific Outcome of Education (Honours)

Education is the basis of human life. Development and progress of man depends on education. It also helps in building of personality.

Our students pursuing Honours and General are highly benefited in several aspects in their daily life.

- Education help the students to realize their own inner potentialities, capabilities, and aptitudes. They are able to understand their weaknesses and strength. Education helps them to discover their skills, expand and stretches their mind expose students to new topics and pushes them to grow.
- Students are aware of how the modern education system has emerged through studying History of Education. It helped to know about the historical perspective, how technology, Science, society has got progressed and advances our education system.
- Education has provided the students with a sense of empowerment, choose their appropriate path, better decision making abilities, unity and trust among each other etc.
- Most importantly they are taught good cognitive and communication skills.
- Students are able to know various basic principles of Indian and Western schools of philosophy.
- Students are enriched by knowing the national values which they can utilize in their daily life.

Netaji Nagar College for Women

Department of Education

Course Outcome of Education (Honours)

Sr. No	Semester	Course code CC paper	Course Name	Course outcome
1	Semester 1	CC 1	Introduction to Education	**Objectives:** • To understand the meaning, nature, scope and aims of education. • To explain the factors of education and their interrelationship. • To become aware of different agencies of education that influence education. • To be acquainted with the concept of child-centricism and play-way in education
2	Semester 1	CC 2	History of Indian Education	**Objectives:** • To be acquainted with the salient features of education in India during ancient and medieval times • To be acquainted with the development of education in British India • To be acquainted with the significant points of selected education commissions & national policy of education in independent India
3	Semester 2	CC 3	Psychological Foundation of Education	**Objectives:** • To understand the meaning of Psychology and be acquainted with it's different aspects. • To know the patterns of different aspects of human development and relate this knowledge with education. • To be acquainted with the cognitive approach of development and thus to understand the process and factors of cognition.
4	Semester 2	CC 4	Philosophical Foundation of	**Objectives:** • To understand the meaning and relation

			Education Objectives:	of philosophy and education • To understand the importance of philosophy in education • To be acquainted with the Indian schools of philosophy and their impact on education • To be acquainted with the western schools of philosophy and their impact on education • To develop an understanding of philosophy for development of humanity
5	**Semester 3**	**CC 5**	**Sociological Foundation of Education**	**Objectives:** • To understand the relation between Sociology and Education . nature, and scope of Sociology of education. • To explain the concept of Social Groups and Socialization process. • To enable the students to understand the concept of Social change and Social interaction in education • To become aware of social Communication in Education
6	**Semester 3**	**CC 6**	**Educational Organization, Management and Planning**	**Objectives:** • To develop the concept of an ideal organization in educational institutions. • To know the essential functions of educational management. • To understand the different aspects of planning,
7	**Semester 3**	**CC 7**	**Guidance and Counseling**	**Objectives:-** • To know the concept of guidance • To know various types of Guidance • To Know the basic concept of Counseling • To find out the basic data necessary for Guidance
8	**Semester 3**	**SEC 1**	**Communication Skill**	**Objectives:** • To understand the basic elements of Communication • To acquire Listening Skills • To acquire Speaking Skills • To acquire Reading and Writing Skills
9	**Semester 4**	**CC 8**	**Technology in Education**	**Objectives:** • To develop an understanding of educational technology

				• To be acquainted with the system approach • To develop an understanding of the use of computer in education and communication • To get acquainted with the instructional techniques and different models of teaching • To develop an understanding of ICT & e-learning.
10	**Semester 4**	**CC 9**	**Curriculum Studies**	To develop an understanding about concept, nature, types and major approaches of curriculum • To understand the relation among curriculum, pedagogy and assessment • To develop an understanding about curriculum development and national curriculum frame work, 2005 To get acquainted with content selection and selected theories in this regard • To develop an understanding of evaluation & reform of curriculum
11	**Semester 4**	**CC 10**	**Inclusive Education**	**Objectives:-** • Understand the meaning of Inclusion and exclusion • Know the types of exclusion and their causes • Know how to bring about inclusion in different spheres
12	**Semester 4**	**SEC**		**Objectives:** • To understand the basic concept of teacher education. • To explain the historical perspective and development of teacher education in India. • To enable the students to understand the Role of the different agencies in teacher education: • To make an idea about Some Courses for preparation of teacher

	Semester 5	**CC 11**	**Evaluation and Measurement in Education**	**Objectives:-** • To develop understanding of the concepts of measurement and evaluation in education. • To be acquainted with the process of Evaluation • To be acquainted with different types of measuring instruments and their uses. • To develop understanding of the concepts of validity and reliability and their importance in educational measurement. • To be acquainted with the principles of test construction.
13	**Semester 5**	**CC 12**	**Statistics In Education**	**Objectives:** • To develop the concept of statistics and to develop skill in analyzing descriptive measures • To be acquainted with the concept of Normal Probability Curve and its uses in education
14	**Semester 5**	**DSE 2**	**Teacher Education**	. **Objectives:** • To understand the basic concept of teacher education. • To explain the historical perspective and development of teacher education in India. • To enable the students to understand the Role of the different agencies in teacher education: • To make an idea about Some Courses for preparation of teacher
15	**Semester 5**	**DSE4**	**Educational Thought of Great Educators**	**Objectives:-** • To develop an understanding of educational ideas of Indian and Western Educators • To understand pedagogical concepts given by Indian and Western educational thinkers
16	**Semester 6**	**CC 13**	**Psychology of Adjustment**	**Objectives:** • To understand the concept of adjustment, maladjustment and some commonly found problem behavior. • To know the multi-axial classification of

				mental disorders. • To be aware about different coping strategies for stressful situation. • To know the administration, scoring and interpretation of the psychological tests.
17	**Semester 6**	**CC 14**	**Basic Concept of Educational Research**	**Objectives**:- • Have a concept of educational research • Learn about the various steps to be followed for conducting a research • Learn how to write a research proposal and review research papers
18	**Semester 6**	**DSE 4**	**Gender and Society**	**Objectives:** • To understand the basic terms, concepts used in gender studies. • To understand the gender discrimination in construction and dissemination of knowledge. • To develop an awareness and sensitivity
19	**Semester 6**	**DSE 4**	**Women Education**	**Objectives:-** • To know the historical perspectives of Women Education • To know the Policy Perspectives and Committees and Commissions on Women Education • To know the role of Indian thinkers towards Women Education • To identify major constraints of Women Education and Women Empowerment.

Department of English- Programme Outcomes

The evolution of English into a global language, transforming it into an 'indispensable link language' between people not only across borders but within a culturally and ethnically diverse nation like India, has influenced English language teaching and learning greatly. The history of English language teaching can be traced back to the colonial period when the British imparted instructions in English with the sole purpose of training a class of high caste Indians to become mediators of British administration. The British policy, so widely popularised was to create native communicators who would be "Indians in blood and colour but English in taste, in opinions, and morals and intellect." Although, it was decided by the Indian government, that the official status of English as an assistant language is to be terminated after 15 years of Independence, it continues to remain the main language in both oral and written modes of communication. It serves as a connecting link among formal and informal relations.

The scope of the study of LCC course is so designed as to inform the students of the varieties of English language, of the factors affecting effective communication, and lastly propelling them towards creative reproduction of language. The course caters to the B.A general students and is structured in a fashion so as to enable them to find employment opportunities in different vocational sectors like journalism, anchoring, marketing, tourism and others in future where linguistic skills play a deterministic role. The subject motivates the students to realize how language enables better cognition of one's own self, one's social surrounding and relationships. Language gives credit to one's emotions and experience. Whether arousing public sentiments leading to agitations or comforting the distressed mind or providing instructions on fellow feeling and sympathy, everything is made possible through successful rendition of language. Reading of the literary pieces by prominent writers simultaneously encourages contemplation and elevates the minds of the students.

Programme Outcomes (English General Course; LCC):

PO 1. Analytical and Communication Skills:

The Course helps in proper understanding of the linguistic varieties, British and American English language respectively. They are educated on the similarities and the differences between the two languages determined by political, socio-cultural factors. A thorough knowledge on the two dominant variants of English discourses allows students to analyse and consider cultural constitution of a person and communicate effectively.

PO 2. Cognitive Knowledge:

The study attempts to help students to make sense of their inner selves and the society revolving around them. It acquaints them with the political, socio-cultural history of India through the writings of the precursors of Indian Literature like R.K. Narayan, Prem Chand, Bhisham Sahni Prushottam Lal, Nissim Ezekeil and others. It also strives to make them responsible citizens and ambassadors of environmental protection, conservation and regeneration through the inspirational life sketch of Chandi Prasad Bhatt, a dedicated environmentalist.

PO 3. Inculcating Social and Ethical Values:

The literary pieces selected for critical analysis under the purview of this course bear a national as well as an ideological responsibility. They constantly harp upon the pervading evils of bigotry, caste bias, class differences within the existing social system and seeks to promote filial bonding, religious tolerance, sympathy and love. The poem 'Life' by Purushottam Lal, 'Roots' by Ismat Chughtai are testimonies of the aforesaid care ethics.

PO 4. Promotion of Concepts of National Integration:

The texts of Shashi Tharoor and Ismat Chughtai try to point out that India's pluralism and religious tolerance serve as the binding force in an infinitely diverse nation like India and lead towards national integration. Tharoor's poignant utterance that "we are all minorities in India" creates resonance and establishes an element of commonality among citizens.

PO 5. Inter-disciplinary:

The study caters to the learners from all disciplines and helps them to refine their communication skills essential for securing a job in any field for example media, anchoring, journalism, tourism, marketing, teaching, content development, Human Resource management and likewise.

Programme Specific Outcomes:

PO 1. The Course emphasizes on learning the use of formal and informal English Language based on place, time and relation.

PO 2. The Study helps the students to recognize the newly emerging trends of British English and American English. They need to take account of the differences between the two varieties regulated by regional and cultural specificities and contexts.

PO 3. The Study seeks to establish connections between spoken and written language

PO 4. The Course attempts to enlighten the students in the techniques and methods of effective communication and content creativity like writing story, travelogue, and advertisement matters.

PO 5. English as a discipline makes the students conscious of the political and social dynamics of India's both public and private domain as navigated by eminent critics like Ismat Chughtai, Shashi Tharoor, Gauri Deshpande and others.

Netaji Nagar College for Women, Kolkata-92

Department of English

Course Outcome of AECC- Communicative English (Compulsory Education for all)

Sl	Semester	Course Code	Course Name	Course Outcome (Cos) *After the successful completion of the course a student will be able-*
1.	Sem-I (July to December)	AECC1	Ability Enhancement Compulsory Course or Communicative English Full Marks-100, Credit-2	CO 1. To understand the basic English grammar fundamental for language formation. CO 2. To make proper application of the grammatical rules in both oral and written modes of communication. CO 3. To identify the errors in the use of the language in both verbal and nonverbal form.

Netaji Nagar College for Women, Kolkata-92

Department of English

Course Outcome of English General (LCC) for B.A. General Students

Sl	Semester	Course Code	Course Name	Course Outcome (Cos) *After the successful completion of the course a student will be able-*
1.	Sem-III (July to December)	LCC1-1 ENG-C	Language Variety and Stylistics Full Marks-100, Credit-6 (Th:5+ Tu:1)	CO 1. To learn the difference between formal transmission of information in an organizational set up, and casual exchange of thoughts and ideas with familiar people in a friendly environment. CO 2. To understand the dissimilarity in language and contrast of purpose in case of official communication compared to personal communication CO 3. To write letters, emails, report events, develop content from the acquired knowledge of the subject and rules of composition in each case. CO 4. To evaluate the validity of the sentences, correct syntactical errors, mistakes in tense and verbs and prevent

				miscommunication of ideas or disrespect of the language. CO 5. To distinguish between British English and American English and participate in effective communication considering the ethical composition of the addressee.
2.	Sem-IV (January to June)	LCC2-1 ENG-G	Language, Society and Personality (Alternative English) Full Marks-100, Credit-6 (Th:5+ Tu:1)	CO 1. To understand the various application of language in expressing social impressions in writing. CO 2. To discern how language connects individual and society. CO 3. To explore the creative writings by the experts in order to acquaint themselves with the style of representing one's political, social, cultural, and historical beliefs and ideas. CO 4. To learn presentation of biographical history, distinct from other creative writings, in factual, reliable and transparent form. CO 5. To acquaint themselves with the socio-political-cultural history of India and link the present with the past. CO 6. To familiarize with the socio-political-cultural indices affecting the social and private life of an individual.
3.	Sem- V (July to December)	LCC1-2 ENG-C	Language, Imagination and Creativity Full Marks-100, Credit-6 (Th:5+ Tu:1)	CO 1. To differentiate between plain colloquial language and artistic figurative language leaving lasting impression upon the readers. CO 2. To compare the variance in language of prose and language of poetry. CO 3. To understand the application of figures of speech into poetical compositions. CO 4. To expose themselves to beautifully structured, brilliant, compact ideas. CO 5. To learn content creativity like writing stories, travelogues and advertisement matters. Practicing content writing will ensure placement in different corporate jobs.
4.	Sem- VI (January to June)	LCC2-2 ENG-G	Language, Creativity and Analysis	CO 1. To learn how language evolves through creativity. CO 2. To establish link between past and present forms of writing, and draw

			(Alternative English) Full Marks-100, Credit-6 (Th:5+ Tu:1)	parallels and intersections between different generations of writers. CO 3. To analyse and decode the use of various figurative speech within the written language for the sake of artistic embellishment CO 4. To acquire comprehensive knowledge about English language through the refinement of the analytical aptitude and exposure to mature presentation skills of world renowned writers.

NETAJI NAGAR COLLEGE FOR WOMEN

DEPARTMENT OF ENVIRONMENTAL SCIENCE

(PROGRAMME SPECIFIC OUTCOMES)

Environmental Science comprises inputs from several disciplines and is considered as an interdisciplinary subject. Therefore students of Environmental science acquire in depth knowledge and skills in relevant fields like natural resource management, biodiversity conservation, environmental impact assessment, environmental management, waste management, pollution control, green technologies, social issues related to equitable use of resources and sustainable development.

Environment Sciences programme bridges the gap between the school level and M.Sc. programmes on environment and its management offered by various Universities. Therefore Students graduating from Environmental Science will be able to take up higher studies in Environmental Science and other related spheres and subsequently take up careers in the fields of environmental research and monitoring from different Indian and Foreign Universities.

Environmental Science programme deal with the topics that will cover issues from all attributes of the environment; issues from physical environment to socioeconomic and cultural environment. It provide students with the scope to develop knowledge base covering all attributes of the environment and enable them to attain scientific/technological capabilities to address questions and finding solutions vis-à-vis environmental issues in general and effect of anthropogenic activities on environment in particular.

Environmental Science is considered as a job oriented programme and has significant relevance to the current needs of our society. Several organisations have the essential need of technical manpower and the knowhow to handle the environmental needs of the current scenario vis-à-vis scientific, technological, remedial and socioeconomic types. Therefore students graduating with Environmental Science will have ample scope to pursue their carrier in different jobs offered by government or private sectors in the field of teaching, research management etc. linked with environment.

On successful completion of Undergraduate programme in Environmental Science of University of Calcutta a student will-

PSO1: Acquire in depth knowledge related to environment and its components and their interrelationships.

PSO2: Acquire detailed knowledge on perspectives of Environmental Education in both formal and non-formal mode and its importance in the current scenario to our society.

PSO3: Learn ecological methodologies and techniques related to measurement of biodiversity and interpreting it in the context of conservation of biodiversity.

PSO4: Acquire detailed knowledge on physical and chemical processes of the environment and processes responsible for alteration of the same.

PSO5: Acquire detailed knowledge on water resource and land management in the context of water harvesting techniques and proper land use methodologies.

PSO6: Learn all attributes of Environmental biotechnology and its applications.

PSO7: Develop analytical skills for quantitative estimation of water and air quality parameters and physico-chemical parameters of soil.

PSO8: Able to prepare projects or plans on topics related to environment and its conservation.

PSO9: Develop sound knowledge about atmospheric process, global climate change and ozone layer depletion.

PSO10: Learn application of remote sensing and GIS in water resource management, land use planning, forest resources, marine and atmospheric studies.

PSO11: Develop sound knowledge and enhance skills on topics such as Environmental Impact Assessment, Environmental Management, Cost benefit analysis, Life cycle assessment and its applications.

PSO12: An insight into the international law and response towards global environmental issues and enforcement of international protocols to combat the issues. Also student will able to learn Constitutional provisions, Legislations of and Polices framework of India related to environment and its conservation.

PSO13: Gain knowledge on cause and effects of pollution of different spheres and its minimization techniques.

PSO14: Gain in depth knowledge on all aspects of waste management.

PSO15: Develop sound knowledge on green planning, green infrastructure, green chemistry and green technologies.

PSO16: Develop sound knowledge on energy demand, energy resources and its inter relationship with environment.

PSO17: Develop sound knowledge on all attributes of Environmental Health and Toxicology and perform experiments related to toxicity assessment.

PSO18: Develop sound knowledge on disaster management along with hazard, vulnerability and risk assessment.

PSO19: Inculcate knowledge of environmental accounting, environmental modelling and statistical procedures.

PSO20: Thoroughly understand the concerns of sustainable development meeting the sustainable development goals.

COURSE OUTCOMES

ENVIRONMENTAL SCIENCE (HONOURS)

Semester-I, II, III, IV (Under CBCS)

Sl No.	Semester	Course Code, ENVA Paper Code	Course Name	Unit	Course Outcomes After completion of the following courses students will be able to-
1.	**I**	**ENV-A-CC-1-1-TH** **Full Marks: 50** **Credit : 4**	EARTH AND EARTH SURFACE PROCESSES	**1**	To understand the origin of Earth and its components over geological time.
				2	Understand basic geological and tectonic processes and various aspects of the earth's geomorphological formations.
				3	Understand the development of various geological components of the earth.
				4	Describe with the evolution of Earth's atmosphere its composition, vertical structure and functionality along with atmospheric interfaces.
				5	Describe the formation of mountains and river systems of India along with evolution of Monsoon and its effect in India.
2.	**I**	**ENV-A-CC-1-1-P (Practical)** **Full Marks: 30** **Credit : 2**	EARTH AND EARTH SURFACE PROCESSES	Prac.	Recognize and use the various tools and techniques employed for identification of rocks and minerals and interpret toposheets vis-à-vis geomorphology study.
3.	**I**	**ENV-A-CC-1-2-TH** **Full Marks: 50** **Credit : 4**	PHYSICS AND CHEMISTRY OF ENVIRONMENT	**1**	To have a comprehensive understanding of the fundamental concepts related to Environmental Physics
				2	To have a comprehensive understanding of the fundamental concepts related to Environmental Chemistry
				3	Describe the interactions between atmospheric components to understand the basics of atmospheric system.
				4	Describe the concepts of water chemistry and its relation to water quality
				5	Describe clearly the composition, physicochemical parameters and nutrient dynamics of soil.
					Contd…

4.	**I**	**ENV-A-CC-1-2-P (Practical) Full Marks: 30 Credit : 2**	PHYSICS AND CHEMISTRY OF ENVIRONMENT	Prac.	To perform the analysis of alkalinity, acidity, hardness of water samples and measure pH, moisture and conductivity of soil samples.
5.	**II**	**ENV-A-CC-2-3-TH Full Marks: 50 Credit : 4**	WATER AND WATER RESOURCES MANAGEMENT	**1**	Describes the basics of the various water sources and the continually ongoing hydrological cycle and its significance for existence of life on the earth.
				2	Understand the physicochemical properties and biological entities existing in the various aquatic ecosystems and their subsequent implications to the environment.
				3	Understand the importance of water management and the hydrogeological features above and beneath the earth.
				4	Understand the concept of wetlands, its functionality and conservation practices.
				5	Describes the different water resources available in India. Critically examine water resource management systems in India specially river sharing among different states.
6.	**II**	**ENV-A-CC-2-3-P (Practical) Full Marks: 30 Credit : 2**	WATER AND WATER RESOURCES MANAGEMENT	Prac.	To learn the basic techniques and consecutively perform analysis of the physiochemical properties of the water related to water quality.
7.	**II**	**ENV-A-CC-2-4-TH Full Marks: 50 Credit : 4**	LAND MANAGEMENT AND SOIL CONSERVATION	**1**	Develop an understanding of land as resource, soil health, soil degradation and critically examine the impact of soil degradation on agriculture and food security and need for soil conservation.
				2	To have a comprehensive understanding of the fundamental concepts soil science
				3	Develop detailed knowledge on soil erosion, soil pollution, nutrient depletion in soil, fertilizer management and soil conservation techniques.
				4	Develop the ability to judge the impacts of land use land cover change in the two biodiversity hotspots of India.
				5	Assess economic valuation of land degradation, correlate threats

					of land degradation with ecosystem services and learn the different aspects related to sustainable land use planning.
8.	**II**	**ENV-A-CC-2-4-P (Practical) Full Marks: 30 Credit : 2**	LAND MANAGEMENT AND SOIL CONSERVATION	Prac.	To perform the analysis of organic carbon, water holding capacity, carbonate and bicarbonate and NPK content of soil samples
9.	**III**	**ENV-A-CC-3-5-TH Full Marks: 50 Credit : 4**	ECOLOGY AND ECOSYSTEMS	**1**	To understand the basic rules and concepts of ecology, ecological processes of nature and relationship between organism and their surrounding environment.
				2	Explain the concept of population Understand and predict population dynamics of the future.
				3	Describes composition and dynamics of community. Judge how the habitat shapes the distribution and abundance of species. Understand the relationship between different species. Examine the process of succession.
				4	Explain the interconnectedness of organisms to their environment. Examine the structure and functions of ecosystem.
				5	Understand the cyclic pathways of essential elements among different components of the environment. Develop the ability to judge ecological dynamics and regulation of vital processes in the environment.
10.	**III**	**ENV-A-CC-3-5-P (Practical) Full Marks: 30 Credit : 2**	ECOLOGY AND ECOSYSTEMS	Prac.	Enhance their ability to apply lessons learned from field experience vis-a- vis ecological dynamics of nature. Record biotic and abiotic components and interactions Develop ecological hypotheses and designing studies in the field and laboratory settings.
					Contd...

11.	**III**	**ENV-A-CC-3-6-TH** **Full Marks: 50** **Credit : 4**	ENVIRONMENTAL BIOTECHNOLOGY	**1**	Understand the basics concepts related to classification of microorganisms, microbial growth and staining techniques
				2	Describe the Structure and Function of DNA, RNA and Protein their biological significance and central dogrma of biology.
				3	Acquire in depth knowledge of all the aspect related to Recombinant DNA technology
				4	Describe the role of biotechnology in wastewater treatment, solid waste management. Understand role of Environmental Biotechnology in general and bioremediation and phytoremediation technologies in particular
				5	Understand ecologically safe products such as PGPR bacteria, bio-fertilizers etc. and processes including Integrated pest Management, Bio-mining and microbial transformation
				6	Acquire in depth knowledge of GM and GMOs and its pros and cons. Identify the case specific studies related to GMOs To have an functional understanding of Biosafety Protocol
12.	**III**	**ENV-A-CC-3-6-P (Practical)** **Full Marks: 30** **Credit : 2**	ENVIRONMENTAL BIOTECHNOLOGY	Prac.	Perform Gram staining, MPN and ABO Blood grouping Review Research article related to various fields of Environmental Biotechnology and prepare power point presentation
13.	**III**	**ENV-A-CC-3-7-TH** **Full Marks: 50** **Credit : 4**	ATMOSPHERE AND GLOBAL CLIMATE CHANGE	**1**	Understand the energy transfer mechanisms and their significance for existence of life on the earth
				2	Understand the various air mass development and movement across the globe with a deeper insight into the Indian monsoon formation
				3	Deal with measurable or systematic principles for meteorological features and

					prediction of atmospheric conditions from plume behaviour
				4	Emphasize on the potentiality of the various greenhouse gases to induce changes in climatic conditions and various measures taken by the governing bodies to combat such issues.
				5	Understanding the significance of the protective ozone layer and the reasons behind its destruction along with the mitigation measures approached.
14.	**III**	**ENV-A-CC-3-7-P (Practical) Full Marks: 30 Credit : 2**	ATMOSPHERE AND GLOBAL CLIMATE CHANGE	Prac.	Deal with various instruments to determine meteorological parameters
15.	**III**	**SECA2 Full Marks: 80 Credit : 2**	WILDLIFE MANAGEMENT	**1**	Understand the historical and current perceptions of human wildlife relationship to efficiently discourse wildlife issues and the role of citizens in conservation and management of wildlife decision-making.
				2	Understand the fundamental concepts in wildlife conservation and management with help of special case studies of India.
				3	Develop skills for assessing status and estimating wildlife for wildlife management practices and conservation.
16.	**IV**	**ENV-A-CC-4-8-TH Full Marks: 50 Credit : 4**	SYSTEMATICS AND BIOGEOGRAPHY	**1**	Develop an understanding of the concept of species, classification and their evolutionary relationship based on the morphological and phylogenetic characters.
				2	To have a functional understanding of the rules and regulations adopted universally for naming of species and its classification.
				4	Illustrates the global species distribution, the key biogeographic principles along with processes behind this distribution in the past and present scenario. Provide an outline of the approaches for studying the species geographic ranges, evolution and conservation.
					Contd…

				5	Understanding the processes and barriers involved in species formation, dispersal and extinction.
17.	**IV**	**ENV-A-CC-4-8-P (Practical) Full Marks: 30 Credit : 2**	SYSTEMATICS AND BIOGEOGRAPHY	Prac**.**	To classify and identify environmentally significant flora and fauna according to taxonomy.
18.	**IV**	**ENV-A-CC-4-9-TH Full Marks: 50 Credit : 4**	URBAN ECOSYSTEMS	**1**	Understand urban setting and its relation to environment comprising social, cultural ecological and economical perspectives.
				2	Understand all aspects of urban dwelling in general and Urban sprawl and its effects in particular
				3	Acquire in depth knowledge of green technology, green energy, green infrastructure, green economy, and, green chemistry; sustainable consumption of resources
				4	Understand all aspects of controlled nature and importance of green belts.
				5	To have a functional understanding of green buildings including LEED, Eco-mark certification, green planning , green cities rain water harvesting and its importance in Municipal areas and role of informal sector in waste management, public transportation for sustainable development
19.	**IV**	**ENV-A-CC-4-9-P (Practical) Full Marks: 30 Credit : 2**	URBAN ECOSYSTEMS	Prac.	Develop skills in performing urban surveys to record all data required in studying an urban ecosystem.
20.	**IV**	**ENV-A-CC-4-10-TH Full Marks: 50 Credit : 4**	ENVIRONMENTAL LEGISLATION AND POLICY	**1**	Understand the basic judicial and legislative structure in India and an introduction to Indian Constitution
				2	To have a comprehensive understanding on the evolution of Environmental laws in India since the pre-colonial period and inclusion of environmental issues in the laws and policies.
					Contd...

				3	Focus on development of national Environmental laws and enable students to analyse the same for environmental protection.
				4	Understand the role of judiciary bodies towards statutory framework on protection of environment and prevention of pollution.
				5	An insight into the international law and response towards major environmental issues at global level and enforcement of international protocols to combat the issues.
21.	**IV**	**ENV-A-CC-4-10-P (Practical) Full Marks: 30 Credit : 2**	ENVIRONMENTAL LEGISLATION AND POLICY	Prac.	Understand the scope of environmental law and the Indian legal system against activities adversely impacting the environment and Appreciate some case studies of environmental litigation.
22.	**IV**	**SEC B1 Full Marks: 80 Credit : 2**	ENVIRONMENTAL IMPACT AND RISK ASSESSMENT	**1**	Acquire detailed knowledge on Environmental Impact Assessment (EIA)and Environmental Management Plan
				2	Understand thoroughly EIA types, Cost benefit analysis, ISO 14000, Environmental Management, Environmental audit Lifecycle assessment and Sustainable development.
				3	To have a functional understanding on EIA regulations in India and also to deal with Case studies report pertaining to EIA.
				4	Understand thoroughly Hazard and risk assessment and Environmental monitoring.

ENVIRONMENTAL SCIENCE (GENERAL)

Semester-I, II, III, IV (Under CBCS)

COURSE OUTCOMES

Sl No.	Semester	Course Code, ENVG Paper Code	Course Name	Course Outcomes After Completion of the following Courses Students will be able to-
1.	**I**	**ENV-G-CC/GE-1-1-TH** **Full Marks: 50** **Credit : 4**	FUNDAMENTALS OF ENVIRONMENTAL SCIENCE	**CO1:** Acquire detailed knowledge of the environment and its components and interfaces. **CO2:** Understand Multidisciplinary nature, scope and objective of Environmental Science. **CO3:** Understand Man - Environment relationships. **CO4:** Understand the modes of Environmental Literacy and its importance. **CO5:** Understand Environmental problems and global environmental issues and critically appreciate the environmental concerns of today
2.	**I**	**ENV-G-CC/GE-1-1-P** **(Practical)** **Full Marks: 30** **Credit : 2**	FUNDAMENTALS OF ENVIRONMENTAL SCIENCE	**CO1:** Describe the laboratory safety rules in Environmental Science Laboratory **CO2:** Describe principle and application of instruments in Environmental Science Laboratory. **CO3:** Prepare assignments on Environmental education and global environmental issues.
3.	**II**	**ENV-G-CC/GE-2-2-TH** **Full Marks: 50** **Credit : 4**	ECOLOGY AND BIODIVERSITY	**CO1:** Understand the basic concepts of Ecological Science. **CO2:** Understand the ecology of individual, population, community and ecosystem. **CO3:** Describe composition and dynamics of population and community of biotic species and Examine in detail the structure and functions of ecosystem. **CO4:** Systematically understand the concept of biodiversity its vital role and services. **CO5:** Identify the importance of biodiversity. **CO6:** Identify the threats to biodiversity. **CO 7:** Get acquainted with techniques and indices related to measurement of biodiversity **CO8:** Appreciate the need of biodiversity

				conservation in the current scenario and understand the methods and traditional practices for conservation of biodiversity.
4.	**II**	**ENV-G-CC/GE-2-2-P** **Full Marks: 30** **Credit : 2** **(Practical)**	ECOLOGY AND BIODIVERSITY	**CO1:** Enhance their level of understanding about the process of ecological science in field conditions and develop skills in utilizing techniques for estimation of biodiversity of an ecosystem.
5.	**III**	**ENV-G-CC/GE-3-3-TH** **Full Marks: 50** **Credit : 4**	CHEMISTRY OF THE ENVIRONMENT	**CO1:** Understand comprehensively the concept of Molecular weight, Equivalent Weight, Molarity, Normality, Oxidation and Reduction Reactions; Metals and non-metals; Aromatic & Aliphatic compounds, Saturated and unsaturated hydrocarbons stoichiometry, chemical equilibrium and Acid-base reactions **CO2:** Understand comprehensively the chemistry of water, air and soil and anthropogenic influence in alteration of the above.
6.	**III**	**ENV-G-CC/GE-3-3-P** **Full Marks: 30** **Credit : 2** **(Practical)**	CHEMISTRY OF THE ENVIRONMENT	**CO1:** Estimate water and soil quality parameters
7.	**III**	**ENV-G-SEC-3-A1-TH** **Full Marks: 80** **Credit : 2**	ENVIRONMENTAL LAWS AND POLICY, ENVIRONMENTAL AUDIT AND EIA	**CO1:** Understand the Provision of Indian Constitution related to environmental protection and fundamental rights. **CO2:** Appreciate the policies related to forest and environment in India **CO3:** Understand comprehensively the pollution prevention and control laws in India and also laws related to protection of wildlife, forest and biodiversity in India. **CO4:** Acquire detailed knowledge on scope, objective and steps of Environmental Impact Assessment (EIA)and Environmental audit
8.	**IV**	**ENV-G-CC/GE-4-4-TH** **Full Marks: 50** **Credit : 4**	ENVIRONMENTAL PHYSICS AND METEOROLOGY	**CO1:** Understand comprehensively the fundamental of thermodynamics and Energy equilibrium between biotic and abiotic environmental component

				CO2: Understand comprehensively the concept of radiation physics and various techniques related to environmental physics **CO3 :** Acquire basic knowledge on climatologically parameters for environmental study
9.	**IV**	**ENV-G-CC/GE-4-4-P** **Full Marks: 30** **Credit : 2** **(Practical)**	ENVIRONMENTAL PHYSICS AND METEOROLOGY	**CO1:** Record meteorological parameters such as wind speed, relative humidity, atmospheric pressure, rainfall, insolation and light intensity **CO2:** Understand the functioning of Weather station following visit to Weather station.
10.	**IV**	**ENV-G-SEC-4-B1-TH** **Full Marks: 80** **Credit : 2**	APPLICATIONS OF ENVIRONMENTAL BIOTECHNOLOGY	**CO1:** Understand comprehensively the principles governing different biotechnological methods. **CO2:** Describe application of biotechnology in medicine and industry. **CO3:** Describe the role of biotechnology in wastewater treatment, solid waste management. **CO4:** Understand in details all facets of bioremediation and phytoremediation **CO5 :** Understand ecologically safe products such as PGPR bacteria, bio-fertilizers etc. and processes including Integrated pest Management **CO6:** Acquire in depth knowledge of GM and GMOs and its pros and cons. and to have an functional understanding of Biosafety Protocol.

ENVIRONMENTAL SCIENCE (HONOURS)

B.Sc 3rd year (1+1+1 System)

COURSE OUTCOMES

Sl No.	Year	Course Code, ENVA Paper Code	Course Name	Course Outcomes After Completion of the following Courses Students will be able to-
1.	**3rd**	**VA**	FUNDAMENTAL OF NATURAL RESOURCE	**CO1:** Describe the different types of resources present in Earth along with their complexity, issues and sustainability **CO2:** Learn the different management tools and techniques for sustainable utilization and conservation of natural resources. **CO3:** Acquire knowledge in depth about principles, methods and risk analysis to harvest renewable resources for energy production and consumption.
2.	**3rd**	**VB**	ENVIRONMENTAL MANAGEMENT	**CO1:** Understand comprehensively the concept and function of management **CO2:** Learn the Environmental Management System, ISO, Business Charter for Sustainable development. **CO3:** Describe the global environmental problems and appreciate national and international efforts of environmental protection. **CO4:** Describe the basic principle of Ganga Action Plan and Yamuna Action Plan. **CO5:** Acquire knowledge in depth about rainwater harvesting, wasteland reclamation and joint forest management. **CO6:** Describe in detail the different types of solid waste management. **CO7:** Describe in Environmental Management Plan, Disaster Management Plan and Green belt.
				Contd...

3.	**3rd**	**VI A**	ENVIRONMENTAL LAWS POLICY AND EIA	**CO1:** Understand the Provision of Indian Constitution related to environmental protection and fundamental rights. **CO2:** Appreciate the policies related to forest and environment in India **CO3:** Understand comprehensively the pollution prevention and control laws in India and also laws related to protection of wildlife, forest and biodiversity in India. **CO4:** Acquire detailed knowledge on scope, objective, steps and methodologies of Environmental Impact Assessment (EIA)
4.	**3rd**	**VI B**	ENVIRONMENTAL HEALTH ACCOUNTING AND AUDITING	**CO1:** Understand the concept of Environmental health and principle and methodologies of epidemiology. **CO2:** Understand the concept of different aspects related to disease along with air borne, water borne, soil borne and vector borne diseases. **CO3:** Have elementary idea about immunology. **CO4:** Acquire detailed knowledge on health programmes in India. **CO5:** Acquire detailed knowledge on Environmental accounting and its role towards sustainability. **CO6:** Acquire detailed knowledge on scope, objective, steps and methodologies of Environmental audit (EIA)
5.	**3rd**	**VII A**	ENVIRONMENTAL POLLUTION	**CO1:** Understand environmental pollution and degradation of environmental quality, with emphasis on causes, pathways, risks, control and remediation. **CO2:** Understand the physical, chemical and biological processes involved during contamination of air, water and soil is essential to effectively monitor and control the effects of pollution. **CO3:** Describe the complex relationships between environmental factors and human health, taking into account multiple pathways and interactions is assessed in a broader spatial and socio-economic context.

6.	**3rd**	**VIIB**	TOXICOLOGY OF POLLUTANTS AND WASTES	**CO1:** Understand in detail the concepts and different aspects of toxicology including Phase I and II reactions, LC_{50}, LD_{50} and bioassay **CO2:** Understand the toxicity of toxicity of inorganic and organic pollutants in the context of environment and human health. **CO3:** Understand the health effects associated with noise pollution, radioactive pollutants, indoor air pollutants and thermal pollution along with treatment or minimization or safety measures linked to it.
7.	**3rd**	**VIII**	PRACTICAL	**CO1:** Perform the preparation related to study of metaphase chromosome of mice, meiotic stage of grasshopper testis, and nuclear abnormality in fish and interpret it accordingly. **CO2:** To study aberrant chromosomes and perform isolation of DNA from cell. **CO3:** Identify different fauna associated with disease and describe its epidemiological impact. **CO4:** Understand and record the waste management techniques from field visit.

ENVIRONMENTAL SCIENCE (GENERAL)

B.Sc 3rd year (1+1+1 System)

COURSE OUTCOMES

Sl No.	Year	Course Code, ENVG Paper Code	Course Name	Course Outcomes After Completion of the following Courses Students will be able to-
1.	**3rd**	**IV**	ENVIRONMENTAL POLLUTION, ENVIRONMENTAL HEALTH AND ENVIRONMENTAL MANAGEMENT	**CO1:** Understand systematically the classification of pollutants and different aspects of air pollution, water pollution, noise pollution, pesticide pollution and indoor air pollution. **CO2:** Understand comprehensively the concept environmental toxicology and different aspects associated with it. **CO3:** Understand the concept of Environmental health and principle and methodologies of epidemiology. **CO4:** Understand comprehensively the concept and function of Environmental management and sustainable development. **CO5:** Acquire knowledge in depth about rainwater harvesting and traditional water conservation methods.
2.	**3rd**	**IV B**	PRACTICAL	**CO1:** Analyse dust fall per unit area, Dissolved oxygen, CO_2 and hardness of water samples and interpret it accordingly. **CO2:** Develop skills to collect and study biodiversity of bottom fauna of pond (Field conditions) and interpret it accordingly in the context of contamination of pond with different pollutants.

Netaji Nagar College for Women. Kol- 92

Dept. of Film Studies (General)

Full Marks= 100, Credit= 6 (th-4. pr-2)

C.B.C.S. Degree Programme. B.A Degree Course

PROGRAMME SPECIFIC OUTCOMES:

After graduation the student will be able to learn-

1. To develop the sense of critical thinking and creative writing.
2. To apply the skills of directing, editing and field shooting.
3. To learn how to write a scriptwriting and Screenplay for cinema
4. To learn how to use camera
5. Students will learn a broad knowledge of Indian cinema and world Cinema.
6. To learn how to video and sound editing.

Semester = I, Course Code= FMSG CC/GE I. Course Name. = Film Language & Cinema's Journey from Primitive to Narrative.

Course Outcomes:

1. Students will be able to know pre cinema toys and machines, primary history of cinema.
2. Students will be able to understand cinematography, editing sound and composition.
3. Students will demonstrate that they understand the pre production, production and post production film making process.

Semester= II, Course Code= FMSG CC/GE II. Course Name=History: World Cin

CourseOutcomes:

1. Students will be able to know the basic concepts like German Expressionism. Soviet Montage, and Surrealism.
2. Students will be able to understand what is the Italian Neo- Realism and French New Wave Cinema.

Semester= III, Course Code= FMSG III/GE III, Course Name.= Indian Cinema

Course Outcomes:

1. Students will be able to analyse the Indian Cinema.
2. Students will be able to know the history of Indian Studio system.
3. Students will be able to know many of Indian directors names and their works .
4. Students will be able to basic history of still photography.

Semester= IV, Course Code= FMSG CCIV/GE IV, Course Name.= Documentary

Course Outcomes:

1. An understanding of the major history and theory of documentary film .
2. Students will be able to know some world famous documentary film directors names and their works.

B. A 3RD YEAR , Film Studies General , under 1+1+1 system . paper = 4th paper

Course Outcomes:

1. Students will be able to understand film theories and their relation to technology history and aesthetics.
2. Students will be able to know basic concepts film script writing.
3. Students will be able to understand many of film directors names and their works.

Netaji Nagar College for Women, Kolkata-92
Department of Food and Nutrition
Programme Specific Outcome of Food and Nutrition (Hon.)

Subject Code: FNTA

After successful completion of B.Sc. Food and Nutrition (Hons.) course under CBCS system under University of Calcutta, students can have a thorough knowledge and detail understanding of the areas of food science and nutrition science as mentioned in the syllabus of B.Sc. (Hons.) programme. They get exposed to both theoretical and practical knowledge and this will help them in their future higher studies, research activities, jobs, personality building and in other areas like their own health concerns.

The important domains covered by the course are as follows:
1. Basic Food Science
2. Human Physiology
3. Human Nutrition
4. Community Nutrition
5. Food Commodities
6. Diet Therapy
7. Nutritional Biochemistry
8. Food Microbiology
9. Food Preservation
10. Public Health
11. Mushroom Culture
12. Diet Counseling and Patient Care
13. Geriatric Nutrition
14. Food Packaging
15. Geriatric nutrition
16. Food Fermentation
17. Sports Nutrition
18. Food Service Management
19. Nutrition and Health Education
20. Bakery Science

After gathering the B.Sc. degree, students can progress themselves in higher education or they can apply for jobs. Career progress options coved by the programme are as follows:
1. Taking admission in master degree programme in various universities.
2. Taking admission in diploma in dietetics in various universities.
3. After post-graduation course can explore in the research field as Ph.D scholar, research associates and technical staff.
4. After completion of B.Sc./ M.Sc. programme students can engage themselves as a nutritionist or clinical dietitian in various government and private hospitals, other health sectors, NGOs, government services like NRHM.

5. Students can find their jobs in academics as a teacher or in various food and pharmaceutical companies as well as in hotels as nutrition advisors.
6. Students can start their job career as a freelance nutritionist.

Apart from job careers; after completion this course successfully a student will get a great deal of scientific knowledge about foods, health and hygiene, various disease and their management, healthy habits and other health related issues. This will help them personally and publicly. They can take care of their own health as well as their family member's health. They can contribute in the community to make it healthy and free from malnutrition.

Netaji Nagar College for Women, Kolkata-92
Department of Food and Nutrition
Course Outcome of Food and Nutrition (Hon.)
Full Marks - 100, Credit - 6 (Th: 4 + P2)

Sl	Semester	Course Code FNTA	Course Name	Course Outcome
1.	Sem-1	CC-1-1	Basic Food and Science-I	1. Getting Idea of food science in various ways and have an clear idea on food components
		CC-1-2	Human Physiology -I	Theory: 1. To understand the basic concepts of unit of Life and structure and functions of cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum, Nucleus (nuclear membrane, nuclear chromatin and nucleolus), nucleotide, homeostasis, positive and negative feedback mechanisms. 2. To have a brief idea of the circulatory and cardiovascular system: blood and its composition, formed elements, Blood groups, Mechanism of blood coagulation, introduction to immune system, erythropoiesis and anaemia, structure and functions of heart, cardiac cycle, cardiac output, blood pressure and its regulation. 3. To have clear concepts of digestive system: structure and functions of G.I. tract, process of digestion and absorption of food, structure and functions of liver, gallbladder and pancreas. 4. To gather knowledge about respiratory system: structure of lungs and gaseous exchange (oxygen and carbon dioxide transport). 5. To have an idea about musculoskeletal system: formation and functions of muscles, bones and teeth. Muscle energetic, Isometric and isotonic muscle contraction. Practical:

				1. To determine pulse rate in Resting condition and after exercise (30 beats/10 beats method) 2. To determine blood pressure by Sphygmomanometer (Auscultatory method). 3. To measure Peak Expiratory flow rate (By spirometer) 4. To determine Bleeding Time (BT) and Clotting Time (CT). 5. To detect blood group (Slide method). 6. To measure of Haemoglobin level (Sahli`s or Drabkin method)
2.	Sem-2	CC-2-3	Basic Food and Science-I	1. Getting Idea of food science in various ways and have an clear idea on food components
		CC-2-4	Human Physiology -II	Theory: 1. To understand excretory system, structure and function of skin, regulation of body temperature, structure and functions of kidney in special reference to nephron and physiology of urine formation. 2. To get a brief idea on reproductive system which includes structure and functions of gonads, concept on menstrual cycle, pregnancy, parturition, lactation, menopause and also the process of spermatogenesis and oogenesis. 3. To gather knowledge about nervous system including concept on sympathetic and parasympathetic nervous system, brief anatomy and functions of cerebrum, cerebellum, hypothalamus and neuron, synapse and synaptic transmission, reflexes, special senses. 4. To have a perception on endocrine system: structure and functions of pituitary, thyroid, parathyroid and adrenal gland, structure and functions of pancreas.

				Practical: 1. To perform Harvard Step test 2. To identify histological slides (Lung, Liver, Kidney, Small intestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals) along with their specific characteristics. 3. To know how to perform qualitative estimation of glucose, acetone in urine. 4. To make a perfect blood film and its staining procedures and able to identify different types of blood cells.
3.	Sem-3	CC-3-5	Human Nutrition-I	Getting idea about basic nutrition, the role of nutrition in different stages of life. <u>PRACTICAL:-</u> • Getting idea of various processes involved in cooking like steaming, frying, grilling, pressure cooking, microwave cooking etc. • Having concepts of weights & measures of raw and cooked food stuffs involving eye estimation of the same. • Planning and preparation of foods by combining different food groups and analyzing their significance in relation to health. Planning and preparation of supplementary foods for different age groups and low cost diets for malnourished children with their nutritional significance
		CC-3-6	Community Nutrition	Theory: 1. Understanding basic concept of community, types, health, factors affecting community health, nutritional surveillance and its importance. 2. Understanding the different procedure of assessment of nutritional status by antropometric assessment, biochemical assessment, clinical sign & symptoms and diet survey and its importance in community nutrition. 3. Understanding about the aims and objectives of various national and international agencies and their roles in community health. 4. Elaborating the different nutrition intervention

				programme in India to combat malnutrition. Practical: 1. Acquiring the ability to assess the nutritional status of children and how to interpret the data by using WHO growth standard and by using WHO BMI cut off in case of adults. 2. Understanding the importance of growth chart and how to use it. 3. Understanding of to detect different signs and symptoms, that are related to various nutritional deficiencies. Understand the difference between signs and symptoms. 4. Understanding how to conduct diet survey.
		CC-3-7	Food Commodities	<u>THEORY:</u>- • Understanding structure, classification, composition, nutritional aspects, selection, storage procedures, spoilage and products of – Cereals & Millets, Pulses & Legumes, Milk & Milk Products, Eggs, Meat, Fish & Poultry, Vegetables & Fruits. • Types, manufacture, selection, storage, preservation and role in cookery of sugar & sugar products, fats & oils. • Having concept of types, storage, processing and uses of raising and leavening agents, food adjuncts (spices, condiments, herbs etc.), convenience foods, salt & beverages. Practical: Getting idea about food adulteration and common adulterants present in food stuffs.
		SEC-A2	Food service management	1. Getting Idea of food service industry in various ways and have an clear idea on different components of the service units. 1. To understand the different types & styles of food service with their characteristics. 2. Description of the different steps involved in food service. 3. Understanding kitchen layout- lightning, ventilation, working heights, proper hygiene in preparation, serving and storing unit. 4. Understanding the importance of sanitation, hygiene and personal hygiene in food service area and how to handle the foods. 5. To plan different types of menu provided in different food service institutions. Understand the procedure the menu planning and what points should be kept in mind while plan a menu.

4.	Sem-4	CC-4-8	Human Nutrition - II	Getting idea about basic nutrition, the role of nutrition in different stages of life. PRACTICAL:- Planning preparation and calculation of the nutrients provided by meals for different age group with special reference to different physiological conditions like infancy, preschool children, school children, adolescent period, adults, pregnancy, lactation and old age.
		CC-4-9	Diet Therapy-I	THEORY:- • Understanding the concepts objectives and principles of diet therapy, therapeutic adaptations of normal diet and classification, composition and implication of therapeutic diets. • Assessing patients need (diet counselling) through team approach of health care. • Having the concept of routine hospital diets – regular, light, soft, fluid, parenteral and internal feeding. • Understanding the principles and management of diet for different febrile conditions like influenza, malaria and typhoid. • Understanding etiology, symptoms and management of diseases of stomach, intestine, liver & biliary system. • Having the general concept, etiology, classification and dietary management of nutritional anaemia. PRACTICAL:- Planning, preparation and calculation of nutritive value of various nutrients obtained from normal diets, fluid diet, soft/semi-solid diet and diets for diseases like peptic ulcer, viral hepatitis and anaemia.
		CC-4-10	Nutritional Biochemistry-I	Theory: 1. To have an introductory idea of biochemistry from its definition, objectives, scope and inter relationship between biochemistry and other biological science. 2. To have concept about enzymes its definition, types and classification of enzymes, definition and types of coenzymes, functions of coenzymes and cofactors, Specificity of enzymes, Isozymes, brief idea on enzyme kinetics including factors affecting enzyme action, velocity of enzyme catalysed reactions, regulations of enzyme activity, zymogen,

				allosteric enzymes, enzyme inhibition. 3. To understand the mechanism of intermediary metabolism: Carbohydrate Metabolism, Glycolysis, TCA cycle & energy generation, HMP Shunt pathway, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation. 4. To have brief knowledge of lipids and their Oxidation and biosynthesis of fatty acids (saturated & mono-unsaturated), Synthesis and utilization of ketone bodies, Ketosis, fatty livers, Essential Fatty acids, Cholesterol and its clinical significance. Practical: 1. To know the procedure of Quantitative estimation of Sugars (Glucose, lactose, starch) 2. To estimate acid value, iodine value, Saponification value of fats 3. To estimate blood glucose 4. To estimate serum cholesterol
		SEC-B1	Nutrition and Health education	1. Understanding about basic concept, principles, objectives and importance of nutrition & health education. 2. Understanding the different approaches of health and nutrition & health education- individual, group, mass basis. 3. Understanding the different methods of giving nutrition and health education and what are the different tools that are used in these methods. 4. Understanding the procedure to conduct nutrition education programme in a community. Identify the needs of the community and plan the programme according that. 5. Understanding the different nutrition problem that are prevalent in India and how to aware and how to fight against these by halth and nutrition education.

Netaji Nagar College for Women, Kolkata-92
Department of Food and Nutrition
Course Outcome of Food and Nutrition (Gen.)
Full Marks - 100, Credit - 6 (Th: 4 + P2)

Sl	Semester	Course Code FNTG	Course Name	Course Outcome
1.	Sem-1	CC/GE-1-1	Elementary Chemistry	1. Understanding the basic chemistry related to nutrition science and everyday life Theory: 2. Understanding the law of conservation of mass, chemical and physical changes with their characteristics. 2. Describtion of the different laboratory proess-sedimentation, filtration, boiling, evaporation, sublimation 3. Understanding the basic concept of acid, base, pH, buffer, acid base indicators, molar normal solution. 4. Understanding what is colloid, what are the types, properties of colloid, dialysis. 5. Understanding atomic structure, electron, proton, neutron, their properties, symbol and valency of atoms, isotopes, isobars. Electronic configuration of atoms and how they make bonds with other elements 6. Understanding the basic concept of organic chemistry, classification of organic compounds, functional groups, aldehyde, ketones, omega 3 fatty acids. 7. Practical knowledge on detecting some food and basic laboratory method.
2.	Sem-2	CC/GE-	Elementary Physics	Theory:

		2-2		1. To have an idea of units – C.G.S. and F.P.S. system, measurement of mass and weight, common and spring balance. 3. To know the basic concepts of motion of body – displacement, velocity, acceleration units. 4. To understand what is gravity – Acceleration due to gravity. 5. To get an idea about hydrostatistics – Pressure at a point, Archimedes Principles, Specific gravity, viscosity and surface tension. 6. To have knowledge of thermometry, calorimetry. 8. To learn the modes of transmission of heat, and an idea about thermoflask. 9. To know about the three types of matter, changes of state, pressure cooker, Ice-machine. 10. To understand the physics behind static electricity – Changing by friction, conductor and Insulator. 11. To have an idea of primary cell, storage cell, Electroplating. 13. Learn to define Potential, Current - relation between two. 14. To know the measurement of current by ammeter and potential differential by voltmeter. 15. To understand the concepts of electricity and its application in daily life – lamp, toaster, geyser, iron, micro-oven, refrigerator, cold storage, electric fuse. Practical: 1. To understand the use of balance (Weighing a body) 2. To determine specific gravity of a solid (heavier and insoluble in water). 3. To determine specific gravity of a liquid by hydrostatic balance. 4. To know how to determine specific gravity of a liquid by specific gravity bottle. 5. Learn how to read a barometer. 6. To determine lower and upper fixed point of a thermometer.

				7. To have an idea of fitting of electric fuses.
3.	Sem-3	CC/GE-3-3	Elementary Physiology	Theory: 1. To have idea of animal cell: Structure and function. 2. To get an overview of tissue- its definition, structure and functions of different types of tissue, e.g., epithelial, connective, nervous and muscular tissue (special emphasis on blood and bone). 3. To understand digestive system: Structure involve in digestive system (mouth, esophagus, stomach, small intestine, large intestine, liver, pancreas, gall bladder) and their functions. Digestion and absorption of Carbohydrate, protein and fat. 4. To get an elementary idea of metabolism, enzymes and hormones- name and their important functions. Metabolism in brief (Glycolysis, Glycogenesis, Gluconeogenesis, Cori's cycle, Kreb's cycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism. Practical: 1. Learn how to determine blood pressure of humans being- (a) systolic and b) diastolic. 2. Learn to identify histological slides (Blood cells, Stomach, Small intestine, large intestine, Liver, pancreas). 3. To get idea about determination of Bleeding Time (BT) and Clotting Time (CT). 4. Lear how to detect blood group.
4.	Sem-4	CC/GE-4-4	Basic Nutrition and Food Science	Theory: 1. Getting idea about nutrition, food, diet, balance diet, optimum diet, energy. 2. Understanding concept of nutrients, macronutrients, micronutrients and foods can be classified on the basic on this. Clarify carbohydrates, proteins, fats, their classifications, function, sources and their roles in our diet. What are the water soluble and fat soluble vitamins & minerals present in foods and their functions, excess, deficiencies. 3. Describtion the concept of BMR, associated

				factors with BMR, TEE etc and how the energy need of a individual can be calculated on the basis of age, sex, physiological activity. 4. Understanding the basic five food groups and importance of each. 5. Understanding menu planning, diet plan for various age group. Importance of EBF, advantages of breast feeding over bottle feeding. Concept of malnutrition. <u>PRACTICAL:-</u> • Having elementary idea of weights & measures. • Planning, preparation and calculation of various nutrients obtained from dishes prepared by combination of cereals, pulses, vegetables, egg, milk, fish & nuts. • Observing the preparation of jam, jelly, squash & pickles. Planning, preparation and calculation of nutrients present in meals for adult male/female and modifications of diet required during special physiological conditions like pregnancy and lactation.

Netaji Nagar College for Women, Kolkata-92
Department of Food and Nutrition
Course Outcome of Food and Nutrition (Hon.)
Full Marks - 100, Time: 1 year

Sl	Class	Course Code FNTA	Course Name	Course Outcome
1.	**Part-III**	**PAPER VI UNIT I MODULE 20 & 21**	**DIET THERAPY – A1 & A2 THEORY**	• Understanding the concepts objectives and principles of diet therapy, therapeutic adaptations of normal diet and classification, composition and implication of therapeutic diets. • Assessing patients need (diet counselling) through team approach of health care. • Having the concept of routine hospital diets – regular, light, soft, fluid, parenteral and enteral feeding. • Understanding etiological factors, prevention, treatment, energy modification, nutritional care and behavioral modifications of overweight, obesity and underweight along with anorexia nervosa and bulimia. • Understanding the principles and management of diet for different febrile conditions, infections and surgical conditions. • Understanding etiology, symptoms and management of diseases of stomach, intestine, liver & biliary system and endocrine pancreas. • Having the general concept, etiology, classification and dietary management of nutritional anaemia and thalassemia.
		PAPER VI UNIT I MODULE 22 & 23	**DIET THERAPY – B1 & B2 THEORY**	• Having knowledge regarding classification, symptoms, diagnosis and management of diabetes mellitus with special reference to insulin therapy, oral hypoglycemic agents, glucose monitoring, special diabetic foods and artificial sweetners. • Understanding symptoms, etiology, risk factors, management of atherosclerosis, hyperlipidemias, IHD and hypertension with brief overview of lipoproteins and preventive factors. • Having idea of renal diseases like glomerulo-nephritis, nephritis, nephrotic syndrome, renal failure, uraemia, nephrolithiasis along with their classification, etiology, symptoms and dietary management and dialysis. • Knowing the symptoms, diagnosis, dietary management and food selection of food allergies.

		PAPER VII **UNIT II** **MODULE 27**	**FOOD PRESERVATION PRACTICAL**	• Getting idea of different methods of food preservation like drying, freezing, canning, bottling etc. • Getting idea of aseptic handling as well as sources of food contamination. • Preparation of preserved products – pickles, sauces, jam, jelly, squash etc. • Visiting canning industry/dairy farm to observe the practical application of the various methods and processes involved.
		PAPER VIII **UNIT I** **MODULE 28**	**DIET THERAPY – A1 PRACTICAL**	• Planning, preparation and calculation of nutrients present in normal diets, fluid diets, soft/semi-solid diets, high protein diets, low fat & low calorie diets, high fibre diets.
		PAPER VIII **UNIT I** **MODULE 29**	**DIET THERAPY – A2 PRACTICAL**	• Planning, preparation and calculation of nutritive value of diets for the diseases like diabetes mellitus, peptic ulcers, viral hepatitis, cardio-vascular disease, gout and anaemias.

Netaji Nagar College for Women, Kolkata-92
Department of Food and Nutrition
Course Outcome of Food and Nutrition (Gen.)
Full Marks - 100, Time: 1 year

Sl	Class	Course Code FNTG	Course Name	Course Outcome
1.	**Part- III**	**PAPER IV**	**Group A – THEORITICAL**	• Understanding the meaning and concept of community nutrition highlighting the importance of nutrition education, mortality and morbidity rates, maternal and child health, role of health workers and voluntary health organizations like WHO, FAO, ICMR, ICDS, ICAR, CSIR, ANP, VHAI, NIN & CFTRI. • Having idea of structure and layout of food premises like kitchen and pest control. • Understanding the importance of personal hygiene of food handlers in handling and serving food. • Getting general idea of chemical and microbial food contamination, toxins and food toxicology with reference to lead cadmium and zinc. • Understanding contamination of water, its prevention, methods of water purification, water borne pathogens and diseases like diarrhea, dysentery, tyohoid, hepatitis along with their preventive measure and dietary management. • Having idea of food additives, their classification, related health hazards and food adulteration. • Knowing the importance and advantages of food fermentation, emphasizing on fermented milk products, vinegar and fermented pickles. • Getting brief idea about functions and uses of spices like turmeric, cumin, coriander, fenugreek, black pepper, red chili and ajwain.
			Group B – PRACTICAL	• Planning a layout of kitchen along with the commonly used equipment. • Planning, preparation and calculation of nutritive value of diets for the diseases like diabetes mellitus, obesity, viral hepatitis, cardio-vascular disease. • Estimation of blood pressure and hemoglobin concentration in blood of human subject.

Department of History – Programme Outcomes

The courses of the discipline of history are so designed to break the stereotypes of history learning and create interest among the students to study this important branch of social science. The students learn to apply the historical methods, to evaluate critically the record of the past and gain knowledge of the historians' craft or the historiography. The Core and Disciplinary papers provide the fundamental knowledge and pedagogical skills in the discipline of history and in the study of History of India and the World. The programmes are envisaged to provide a large amount of choice to cater to the interests of the students. The Skill Enhancement Courses (SEC) help to develop knowledge and skill that strengthen the future career goals and real-world skills of the students. The BA History programme courses are inter-disciplinary, keeping in mind that specialisation in History is the key to acquire cognitive skills from other disciplines.

Programme Outcomes (Honours Course):

PO1. **Cognitive Knowledge:**

The Course aspires to acquaint the students with the political, social, economic and cultural history of the Indian subcontinent and the World like the History of Europe and East Asia. Students are thus made aware of the Indian heritage and World civilisation as well. It enables them to make journeys from the prehistoric times to Contemporary World with stress on the transition from the ancient to the modern period.

PO2. **Inter-disciplinary Knowledge:**

The study helps to familiarize the learners with varied openings of future research activities in archaeology, museology, anthropology and sociology.

PO3. **Critical and Logical Analysis and Communication Skills:**

It leads to an understanding of International and National Histories and helps in critical evaluation of the current dynamics of politics worldwide and thereby presenting historical insights and communicate novel interpretations through well-researched historical articles in journals and newspapers.

PO4. **Socio-cultural Awareness and Promotion of Concepts of National Integration and International Peace:**

The discipline makes students aware of the varied socio-cultural diversity and thereby developing a concern for society, national unity and evolve methods for promotion of international peace. This also enables and transforms the learners into responsible Indian citizens to make a better India and the world as well.

PO5. **Inculcating Social and Ethical Values:**

It creates a consciousness regarding establishment of gender equality and women empowerment and the application of the knowledge of history in every aspect of human life and fighting for human rights all over the world.

PO6. **Awareness of our Rich Heritage:**

History as a discipline inculcates an awareness for the preservation of our rich cultural heritage.

Programme Specific Outcomes (Honours Course):

PSO1. The study of historiography would help the students of the discipline of history to construct original historical arguments based on primary source materials. This would help them to develop the knowledge of historical argument and research. They would acquire an understanding of the methods and techniques of research and develop an analytical attitude in the field of History in particular and Social Science in general.

PSO2. The students would be equipped with the skill to understand the present and shape the future on the basis of their acquired knowledge of the past. They would be able to enlighten the society on how to apply the past knowledge for building up a glorious future. With this goal in mind, the students are taken on tours of historical sites across the Hooghly River at Hanseswari Temple in Bansberia, the Imambara and Bandel Church, Indian Museum, Victoria Memorial Hall, Swami Vivekananda's residence, Netaji Bhavan, Jorasanko Thakurbari and St. Pauls Cathedral Kolkata.

PSO3. A bright student of History enriched with the analytical, logical and reasoning skills would be able to pursue a career of a researcher, sociologist, archaeologist, museologist, anthropologist, teacher or can even take up the profession of a tour guide.

PSO4. The study of history and culture would inspire the students with a dynamic thought process and gain knowledge of the different interpretations on the progress and history of the evolution of the human civilisation. This would help them to have a thorough grip over the different trends and trajectories in the history of India and the world across the centuries.

PSO5. To be acquainted with the ICT tools for presentation in the Seminars.

Programme Outcomes (General Course):

PO1. The students are made aware of the meaning of 'History' or 'Itihasha', that is the chronology of the history of our glorious past which would help them to connect the past with the present.

PO2. To enlighten them on the past histories of India making them understand the narratives of ancient, medieval and modern Indian history along with the changes in the world scenario through the Core and Discipline specific courses.

PO3. The Skill Enhancement Courses (SEC) help to develop knowledge and skill that strengthen the future career goals and real-world skills of the students. The BA History programme courses are inter-disciplinary, keeping in mind that specialisation in History is the key to acquire cognitive skills from other disciplines.

Programme Specific Outcomes (General Course):

PSO1. They would be able to acquire a rudimentary sense of historiography and the knowledge of historical argumentation.

PSO2. The study would help them develop communication skills to express historical perspectives, including writings and oral presentations.

PSO3. The study would enlighten them in the techniques and methods of gaining historical knowledge and thereby help in evaluating historical information.

PSO4. History as a discipline would make them aware of the political, social, economic, cultural and intellectual heritage of our country.

PSO5. The in-depth knowledge and skills that history as a discipline offers would cater to their future employments as museologists, curators, teachers and open gateways for further education in future.

Netaji Nagar College for Women, Kolkata-92
Department of History

Course Outcomes of History

Sl.	Semester	Course Code HISA	Course Name	Course Outcomes (COs)
1.	**Sem-I** **(July To December)**	**CC-1-1**	History of India (From the Earliest times to C 300 BCE) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. This course imparts the basic idea among the students about reconstruction of History based on the primary sources and ancient texts. ***CO 2***. Students can identify prehistoric societies, the settlement pattern of the ancient people and transitional phases based on the ancient remains. ***CO 3***. Students can also correlate the socio-cultural matrix of the ancient people of Indian sub-continent and notion of our present Indian nation.
		CC-1-2	Social Formations and Cultural Patterns of the Ancient World other than India **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. By the end of the course the students will be aware of the gradual evolution of the human race. ***CO 2***. They will be enlightened on the Bronze age civilization throughout the world and the importance of the discovery of Iron. ***CO 3***. Students will be able to identify the socio-cultural patterns of classical antiquity.
2.	**Sem-II** **(January to June)**	**CC-2-3**	History of India (c 300 BCE to c.750 CE) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will acquire knowledge about the socio-economic exploitative mechanism and how it was connected with state formation by the Mauryan rulers. ***CO 2***. This course helps to understand the nature of the ancient state especially between the Mauryan and Gupta period. ***CO 3***. Students also can pinpoint socio-cultural-scientific activities in this period.
		CC-2-4	Social Formations and Cultural Patterns of the Medieval World other than India **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will gain an all encompassing knowledge of Medieval Europe. ***CO 2***. Students will gain a comprehensive view of the basic traits of Judaism, Christianity, and Islam.
3.	**Sem-III** **(July To December)**	**CC-3-5**	History of India (c.750 – 1206) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. This course helps to understand the salient features of the early medieval period. ***CO 2***. They can identify the evolution of the political structures, the socio-economic and cultural substance.
		CC-3-6	Rise of the Modern West –I **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will gain a vast knowledge on the changing concepts of Europe and the socio-economic, religious, and cultural transformation of Medieval Europe leading to the establishment of modern west. ***CO 2***. This course makes the learners familiar with the nature of the society and economy and inherent changes therein. ***CO 3***. Students can trace the changes in the European economy and its connection with the exploration of the 'new world' along with the impact on the native land and its people.
		CC-3-7	History of India (c.1206 – 1526) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Acclimatize the students the history of the Delhi Sultanate from c.1206 – 1526. ***CO 2***. Make them aware of the socio-economic, religious and cultural ambience of the period.
		SEC-3-A-1	Archives and museums **Full Marks - 100, Credit-2**	***CO 1***. To give them a cursory review of the history of the museums and archives. ***CO 2***. To get a thorough knowledge of the nuances and the workings of the above two institutions.

4.	**Sem-IV** **(January to June)**	**CC-4-8**	Rise of the Modern West – 11 **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***.They will gain a detailed knowledge of the scientific, technological, military and the enormous cultural changes taking place in Europe within 15th to 17th centuries. ***CO 2***. They will be made conscious on the development of modern state system and the establishment of concepts of liberalism, democracy and citizens' rights.
		CC-4-9	History of India (c.1526-1605) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. This course helps the students to identify the ideologies of Mughal state by which the "Great Mughals" successfully consolidated and expanded the Mughal Empire. ***CO 2***. It enables the learners to trace how did the Mughal polity, administrative mechanism, economy, trade, commerce, society evolve.
		CC-4-10	History of India (c.1605 – 1750s) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. This course helps the learners to understand cultural synthesis during the Mughal period. ***CO 2***. Students can identify the factors which led to the disintegration of the Mughal State. ***CO 3***. Students can also explore the legacy of the Mughal administrative mechanism and transitional phase in Indian History in between the Mughal Empire and the British State.
		SEC-4-B-2	Art Appreciation: an Introduction to Indian Art **Full Marks - 100, Credit - 2**	***CO 1***. This will equip the students with the knowledge of the Indian art though the ages as a medium of cultural expression. ***CO 2***.Students will be able to understand the diversity of Indian art from ancient to modern times with special stress on its aesthetic value.

Sl	**Semester**	**Course Code HISG**	**Course Name**	**Course Outcomes (COs)**
1.	**Sem-I** **(July To December)**	**CC-1/GE-1**	History of India (From the Earliest times to C 300 BCE) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. It imparts the basic idea among the students about reconstruction of History based on the primary sources and ancient texts. ***CO 2***. Students can identify prehistoric societies, the settlement pattern of the ancient people and transitional phases based on the ancient remains. ***CO 3***.Students can also correlate the socio-cultural matrix of the ancient people of Indian sub-continent and notion of our present Indian nation. ***CO 4.*** Students acquire knowledge about the socio-economic exploitative mechanism and how it was connected with state formation by the Mauryan rulers along with the other dynasties.
2.	**Sem-II** **(January to June)**	**CC-2/GE-2**	History of India (c 300 CE to c.1206 CE) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. This course helps to understand the salient features of the early medieval period. ***CO 2***. They can identify the evolution of the political structures, the socio-economic and cultural substance. ***CO 3.*** This course helps to understand the nature of the transition during the Guptas and post-Guptas times. Students also can pinpoint socio-cultural-scientific exercise in this period.
3.	**Sem-III** **(July To December)**	**CC-3/GE-3**	History of India (c.1206 – 1707) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will be enlightened on the chief characteristics of the Sultanate period. ***CO 2***. Students will gain knowledge on the socio-economic and cultural history of the period. ***CO 3***.This course helps the students to identify the ideologies of Mughal state by which the "Great Mughals" successfully consolidated and expanded the Mughal Empire. ***CO 4***. It enables the learners to trace how did the Mughal polity, administrative mechanism, economy, trade, commerce, society evolve.

		DSE-3-A-2	Some aspects of European History: C. 1780-1945 **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will be able to comprehend the fundamentals of modern European history (C. 1780-1945). ***CO 2***. They will be able to evaluate the revolutionary changes in terms of society, economy and polity leading to the establishment of the modern world system.
		SEC-3-A-1	Historical Tourism: Theory & Practice **Full Marks – 100, Credit-2**	***CO 1***. Students will be enlightened on the history of tourism, the inbuilt cultural heritage of India. ***CO 2***. The journeys through the various architectural structures of India would make them understand the importance of historical tourism and its practical applicability.
4.	**Sem-IV** **(January to June)**	**CC-4/GE-4**	History of India (c.1707 – 1950) **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1***. Students will get a comprehensive view on the various nuances and undercurrents of the history of India (c.1707 – 1950)**.** ***CO 2***. It will help them to get the detailed understanding of the social economic and political scenario prevailing in India and the importance of the colonial legacy.
		DSE-3-B-1	Pattern of Capitalism in Europe C. 16th Century to Early 20th Century **Full Marks - 100, Credit - 6 (Th: 5 + Tu:1)**	***CO 1.*** The course aims at making the students aware of the story of capitalism as a phenomenon in the heartland of Europe. ***CO 2.*** Students will be able to understand the various aspects related to the patterns of Industrial Revolution in continental Europe. *CO 3*. How the phenomenon spread to the rest of the world.
		SEC-4-B-1	Museums & Archives in India **Full Marks - 100, Credit-2**	***CO 1***. To give them a cursory review of the history of the museums and archives. ***CO 2***. To get a thorough knowledge of the nuances and the workings of the above two institutions.

Sl	B. A. Part III (1+1+1 2009 Regulations) Session 2018-19	Course Code HISA	Course Name	Course Outcomes (COs)
1.	History of East Asia from 1839 to 1950) **Full Marks - 100**			***CO 1***. From the first unit of this course students will be able to understand how Chinese nation was stranglehold by the western countries during the 1840s on the one hand. On the other how the gradual growth of nationalism and the rise of Communist ideology in China helped China to become a powerful state in 1940s under the leadership of Mao-tse-Tung. ***CO 2***. From the second unit of this course Students can identify the transformation of Japan from the Tokugawa times to Imperialist Japan based on the economic modernization of Japan.
2.	History of Modern India (c 1800 CE to c.1964 CE) **Full Marks - 100**			***CO 1***. This course helps to understand a significant period of modern Indian History covering the period (c 1800 CE to 1964) ***CO 2***. They will be made aware of the socio-cultural ideas and changes in India in general and Bengal in particular in the 19th Century. ***CO 3.*** They would also be able to understand the ideologies of the Raj, reactions of the indigenous population, the growth of nationalism, colonial policies and the gradual evolution of independent India with special reference to Partition, formulation of our Indian constitution and the Nehru years.
3.	History of Europe from 1789 to 1919 **Full Marks - 100**			***CO 1***. Students will be able to comprehend the fundamentals of modern European history (C. 1789-1919). ***CO 2***. They will be able to evaluate the revolutionary changes in terms of society, economy and polity leading to the establishment of the modern world system.
4.	World Politics in the 20th Century from 1919 to C 20000 **Full Marks - 100**			***CO 1***. Students would be enlightened on the international relations between the two world wars. ***CO 2***. The origins of the Second World War, growth of bi-polarism, emergence of the cold war politics. ***CO 3***. Students will be able to gain a vast knowledge on the scenario of the world since 1945, emergence of Third World, end of socialist regime, Glasnost-Perestroika and globalisation.

Sl	B. A. Part III (1+1+1 2009 Regulations) Session 2018-19	Course Code HISG	Course Name	Course Outcomes (COs)
1.	India and the World **Full Marks - 100**			***CO 1***. From the first unit of this course students will be able to identify the causes which led to the Partition of India along with the worst consequences of this said Partition. ***CO 2***. This course helps the learners how the post-Partition India experienced parliamentary democracy, Nehru's era, economic reforms, tensions between India and Pakistan. ***CO 3.*** From the second unit of this course students would be enlightened on the international relations during the post-second world war times. ***CO 4***. It helps to understand the growth of bi-polarism, emergence of the cold war politics. Students will be able to gain a vast knowledge on the scenario of the world since 1945, emergence of Third World, end of socialist regime, Glasnost-Perestroika and globalisation.

Netaji Nagar College for Women
Department of Mathematics
C.B.C.S. & Three Year Degree Programme: B.Sc. General Degree Course

PROGRAMME SPECIFIC OUTCOMES OF MATHEMATICS (GENERAL): –

After successful completion of the course the students

1. Are equipped with mathematical modeling ability and problem solving skills.
2. Are outfitted with a wide range of mathematical techniques and methods to be used in other scientific domains.
3. Will be able to accurately organize, analyze and interpret data.
4. Are capable of understanding both concrete and abstract problems.
5. Will be competent to apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry.
6. Will be able to use computer programming to solve various mathematical problems numerically.

***COURSE OUTCOMES OF MATHEMATICS (GENERAL)*: –**

SEMESTER – I (Full Marks – 100) (C.B.C.S. Degree Programme)			
COURSE CODE	**COURSE NAME**	**COURSE OUTCOMES**	
MTMG-CC1/GE1 **Credit – 06 (Theory – 05, Tutorial – 01)**	Algebra-I	• To understand complex numbers and equations. • To get acquainted with basic properties of polynomials. • To find the rank of a matrix and solve simultaneous equations.	
	Differential Calculus-I	• To understand Real Number System and Real Valued functions along with the idea Limit, Continuity and Derivative. • To Gain knowledge about function of several variables. • To learn Curvature, Asymptotes, Envelope and Singular Points of a curve.	
	Differential Equation-I	• To understand the genesis of Ordinary Differential Equation. • To learn various methods to solve ODE.	
	Coordinate Geometry	• To be able to use transformation of axes in order to find the nature of a conic. • To gain knowledge about Pole, Polars, Pair of Tangents, Normals, Right Circular Cone.	
SEMESTER – II (Full Marks – 100) (C.B.C.S. Degree Programme)			
COURSE CODE	**COURSE NAME**	**COURSE OUTCOMES**	
MTMG-CC2/GE2 **Credit – 06 (Theory**	Differential Calculus-II	• To get basic ideas about Sequence and Series of real numbers along with various tests for their convergence. • To learn Mean Value Theorems and Taylor series. • To determine the maxima and minima for several variables using higher order derivatives.	
	Differential Equation-II	• To solve linear homogeneous equation and eigenvalue problems.	

– 05, Tutorial – 01)		• To formulate and solve partial differential equations.	
	Vector Algebra	• To learn addition and multiplication of vectors • To find the vector equation of straight lines & planes • To estimate the Work done and Moment.	
	Discrete Mathematics	• To gain knowledge about Integers, Principle of Mathematical Induction, Division Algorithm. • To know congruence relation & class and to find check digits for ISBN, UPC, Credit Card. • To get ideas about Boolean algebra, Logic Gates and Switching Circuits.	

SEMESTER – III (Full Marks – 100)
(C.B.C.S. Degree Programme)

COURSE CODE	COURSE NAME	COURSE OUTCOMES	
MTMG-CC3/GE3 **Credit – 06 (Theory – 05, Tutorial – 01)**	Integral Calculus	• To know evaluation of definite and indefinite integrals. • To know Beta & Gamma functions.	
	Numerical Methods	• To learn about various errors in approximations • To know interpolation, numerical solutions of various equations. • To learn numerical integration	
	Linear Programming	• To learn about formulation & solution of LPP. • To know about convex set, extreme points, feasible solution. • To solve Simplex, Transportation & Assignment problems.	

SEMESTER – IV (Full Marks – 100)
(C.B.C.S. Degree Programme)

COURSE CODE	COURSE NAME	COURSE OUTCOMES	
MTMG-CC4/GE4 **Credit – 06 (Theory – 05, Tutorial – 01)**	Algebra-II	• To gain knowledge about Groups, Rings & Fields. • To know about Vector Space, Linear Combination of Vectors, Linear Dependence & Independence of Vectors. • To learn about linear quadratic forms, Characteristic Equations, Eigenvalues & Eigenvectors.	
	Computer Science & Programming	• To know the Hierarchy of computer languages. • To learn algorithm & flowcharts of computer programming. • To know FORTRAN 77 variables, constants, expressions and programming.	
	Probability & Statistics	• To study Probability theory and probability distribution. • To know sample survey, correlation • To use sampling theory and test null & alternative hypotheses	

PART – III (Full Marks – 100)
(Three Year Degree Programme)

COURSE CODE	COURSE NAME	COURSE OUTCOMES	
	Computer Science & Programming	• To study Boolean Algebra. • To know Computer Anatomy.	

MTMG PAPER- 4		• To gain knowledge about Computer Programming • To learn algorithms & flowcharts of computer programming. • To use M.S. Office, e-mail & Internet.	
	A Course of Calculus	• To get basic ideas about mathematical analysis • To learn Fourier Series. • To solve ordinary differential equations. • To learn Laplace Transform. • To know the Partial Differential Equation.	

Netaji Nagar College for Women

Department of Philosophy- Programme Outcomes

Philosophy in essence is a search of answers. Philosophy is a reflection of a larger picture of the human condition and the history of human thought. Though philosophy is inextricably linked with the contemplation of existence, but it looks at the day-to-day issues people face, moral dilemmas, the acquisition of knowledge, the evaluation of art. Philosophy is a valuable tool for evaluating and improving of students' life and their mental faculties. Philosophy is an activity of the mind. Students can practice philosophy to increase their understanding of things and improve the inner workings of the mind. Whenever students get into a philosophical argument they are allow to expand their ability to reason, to question, also to understand the abstract concepts.

Programme outcomes (Honours course)

PO1: Knowledge Development

Philosophy makes a central contribution to the educational enterprise through its demands upon intellectual activity. This study helps us to enhance students' ability to solve problems, writing skills, communication skills.

PO2: Communicative skill development

Philosophy teaches interpretive writing thought its examination of challenging texts, comparative writing through emphasis on fairness to alternative positions, argumentative writing through developing students' ability to establish their own views. Students are able to communicate well both orally and in writing.

PO3: Logical and critical thinking development

Studying philosophy improves reasoning and critical thinking among pupils. the ability to think logically, the ability to analyze and solve problems are developed among students.

PO 4: Ethical development

The study of philosophy benefits students intellectually, spiritually and morally. They can learn that there is remarkable intellectual and spiritual connection between themselves and people from different times and places.

PO 5: Social and cultural development

Actually retain a great deal of factual information from their excursion. When they go on an excursion it brings them an environment where they explore and experience.

PO 6: Content Development

Philosophy provides students basic tools of self expression, skill in presenting ideas through well constructed systematic arguments. Students learn to build and defend their own views, to appreciate competing positions.

Programme Specific outcomes (Honours course)

PSO 1: Different systems in Indian Philosophy are helpful to provide a vision of the Reality. Along with the study of Greek Philosophy enriches the mind-stuff of the students.

PSO 2: Indian Philosophy is a combination of ethics, religion and philosophy. As such it is wider in its dimension and is helpful for facing Civil Service Examinations. A study of western Philosophy gives a brood idea about Western literature and philosophy and develops a scientific attitude toward Reality among students.

PSO 3: Psychological aspects are given a clear view about the inner world towards students. This area also can enrich a sense of nationalism in students. In the age of globalization the critical study of civilization, liberty, equality and justice etc. are necessary for developing social attitude in students. The area of the study of religion philosophy promotes a sense of spiritualism in students.

PSO 4: A study of Logic enables students to get the knowledge of 'reasoning' which is necessary for appearing competitive examination. Logic is a study of argument or reasoning. It is helpful for different competitive examinations Study of Logic enables students to get the knowledge of 'reasoning' which is necessary for appearing competitive examinations .

PSO 5: The Skill Enhancement Courses (SEC) are interdisciplinary, to develop knowledge and skill that helps students future career goals and real-world skills of the student.

Programme outcomes (General course)

The study of philosophy contributes distinctively and substantially to the development of students' critical thinking. Philosophy is a means by which student can think about critically and come to understand themselves and their existence. Philosophy is an activity of the mind. So students can practice philosophy to increase their understanding of things and improve the inner workings of the mind. Students can developed their ability to reason, to question, also to understand the abstract concepts

PO1: critical and logical thinking development

philosophy is that it is of enormous and enduring interest. By exercising students' mind in the disciplines of critical and logical thought, this helps us to enhance students' ability to solve problems, writing skills, communication skills. It also helps students to analyze concepts, definitions, arguments and problems.

PO2: Communication development

This study provides students basic tools of self expression, skill in presenting ideas through well constructed systematic arguments. It also helps students to enhance their ability to explain difficult material and helps to eliminate ambiguities and vagueness from their writing and speech.

PO3: Carrier development

Philosophy provides students with valuable skills that prepare them for an array of careers including those in international relations, business, public relations, education.

PO4: Ethical development

gain the ability to imagine, debate, clarify the nature of good life. Philosophy encourages and empowers students to discover what really is true and good, right and wrong.

Programme specific outcomes (General course)

PSO 1: Different systems in Indian Philosophy are helpful to provide a vision of the Reality. A study of Indian Philosophy enables students to prepare for PSC and other competitive examinations.

PSO 2: A study of Greek Philosophy enriches the mind-stuff of the students and also enables students to prepare for different competitive examinations

PSO 3: Logic is a study of argument or reasoning. A study of truth-functional logic enables students to know more and more about reasoning. It is helpful for different competitive examinations

PSO 4: The basic concepts of sensation, introspection and the learning methods are enriched students knowledge. Psychological aspects of this topic given a clear view about the inner world towards students.

PSO 5: Ethics is normative science. But the application of ethics in practical life specially in business we need codes of ethics which ensure an organization to run smoothly. It guides us with the principles of ethics like loyalty, fairness, integrity, trust.

PSO 6: The Skill Enhancement Courses (SEC) are interdisciplinary, to develop knowledge and skill that helps students future career goals and real-world skills of the student.

B. A. Part III (1+1+1)- 2009 regulations

Subject- Philosophy

Programme outcomes (Honours course)

The philosophy of a country is the cream of its culture and civilization. All the systems regards philosophy as a practical necessity and cultivate it in order to understand how life can be best led. The aim of philosophical wisdom is not merely the satisfaction of intellectual curiosity but mainly an enlightened life led with far-sight, fore-sight and insight.

PO 1: spiritual development

Philosophical thoughts prevent the mind from ending in despair and guarantee it's final optimism is what may be described as spiritualism. It helps the students to build up spiritualism.

PO 2: knowledge of reality

Ignorance of reality is the cause of our bondage and sufferings, and liberation from there cannot be achieved without the knowledge of reality,i.e, the real nature of the world and the self. It helps to understand the knowledge of reality.

PO 3: Ethical Value

Ethical Value helps the students to deal more effectively with ethical dilemmas by eliminating those behaviour that do not conform to our sense of right or wrong- our best rational interest, without sacrificing others.

PO 4: Idea development

It helps the students to learn the Nature of consciousness and the relationship between mind and matter. It helps to develop the knowledge of existence, objects and their properties, space and time,cause and effect and possibility.

Programme Specific outcomes (Honours course)

PSO 1: Students can learn the logical implications, which helps to acquire true knowledge of reality which is based on logical ground.

PSO 2: Students can learn about the philosophy of language Indian and western. It helps to learn the relationship between nature of language and the world. It can developed an idea of fundamental properties of being with nature.

PSO 3: Student can explore the nature and criteria of knowledge.

Programme outcomes (General course)

Philosophy is the pursuit of wisdom, truth and knowledge. Philosophy has interpreted and his various activities in a comprehensive manner. Philosophy tries to answer the deepest questions to life. It is an attempt to satisfy the desire for knowledge arises from the rational nature of man.

PO 1: Understanding and justification

It helps to understand the thoughtful consideration of human society. The basic laws which operate the society. It helps the students to deal with the critical analysis of society and politics and conceptualise alternative ways to organize society based on morality.

PO 2: contemporary thoughts

It helps the student to understand the science of the self , realistic idealism, freedom, authority and imagination, theory of values, freedom through knowledge and the spirit in man.

Programme Specific outcomes (General course)

PSO 1: Students can develop sense of nationalism, and the system of government. They also learn the rules of civil society, political views. Also social attitudes and knowledge of civilization.

PSO 2: Students can improve their sense of equality, liberty, justice etc. It enriches the views of social, political and spiritual concepts towards the contemporary world.

Netaji Nagar College for Women

Course Outcomes

Philosophy (Honours)

Semester – I

CC – 1 – INDIAN PHILOSOPHY -I

Different systems in Indian Philosophy are helpful to provide a vision of the Reality. A study of Indian Philosophy enables students to prepare for PSC and other competitive examinations.

CC-2– HISTORY OF WESTERN PHILOSOPHY -I

There were many eminent thinkers in Greece. A study of Greek Philosophy enriches the mind-stuff of the students and also enables students to prepare for different competitive examinations.

Semester-2

CC3- OUTLINE OF INDIAN PHILOSOPHY-II

Indian Philosophy is a combination of ethics, religion and philosophy. As such it is wider in its dimension and is helpful for facing Civil Service Examinations

CC4- HISTORY OF WESTERN PHILOSOPHY-II

A study of western Philosophy gives a brood idea about Western literature and philosophy and develops a scientific attitude toward Reality among students.

Semester-3

CC-5- PHILOSOPHY OF MIND

The basic concepts of sensation, introspection and the learning methods are enriched students knowledge. Psychological aspects of this topic given a clear view about the inner world towards students.

CC-6- SOCIAL & POLITICAL PHILOSOPHY : INDIAN & WESTERN.

The fundamental concepts introduced in this paper can enrich a sense of nationalism in students. In the age of globalization the critical study of civilization, liberty, equality and justice etc. are necessary for developing social attitude in students.

CC 7- PHILOSOPHY OF RELIGION

A study of religious philosophy promotes a sense of spiritualism in students. It is helpful for civil service examinations

SEC-A: MAN AND ENVIRONMENT

Indian civilization was known as eco- friendly civilization. In past , it did express a profound awareness of need to evolve a balanced pattern in the man – environment interaction . The Rig – Veda says “my

mother is vast earth". Students can learn about the Indian Environmental tradition and they can know how to protect nature. Upanishads are wisdom teaching that explore the deeper internal meaning sacrificing.

SEMESTER IV

CC 8- WESTERN LOGIC-I

A study of Logic enables students to get the knowledge of 'reasoning' which is necessary for appearing competitive examinations.

CC 9-WESTERN LOGIC -II

Logic is a study of argument or reasoning. A study of truth-functional logic enables students to know more and more about reasoning. It is helpful for different competitive examinations.

PHIA-CC -10 :EPISTEMOLOGY AND METAPHYSICS (Western)

Epistemology and Metaphysics are not very far apart . Metaphysics is the branch of philosophy concerned with nature and fundamental properties of being . It help the students to explore the sources, nature , limits and criteria of knowledge.

SEC-B: EMERGING TRENDS OF THOUGHT

FEMINIST PHILOSOPHY: Feminism is a study of knowing women rights, that includes seeking to establish educational and professional opportunities for women that are equal to those of men.

ENVIRONMENTAL PHILOSOPHY: Environmental Philosophy is concerned with the natural environment and human's place within it. So by studying environmental philosophy student can explore the moral relationship humans have with earth, animals and plants.

Philosophy (General)

SEMESTER-I

PHIG-CC-1: Indian epistemology and metaphysics

Different systems in Indian Philosophy are helpful to provide a vision of the Reality. A study of Indian Philosophy enables students to prepare for PSC and other competitive examinations.

SEMESTER-II

PHIG-CC-2: Western epistemology and metaphysics

There were many eminent thinkers in Greece. A study of Greek Philosophy enriches the mind-stuff of the students and also enables students to prepare for different competitive examinations

SEMESTER-III

PHIG-CC-3: Western Logic

Logic is a study of argument or reasoning. A study of truth-functional logic enables students to know more and more about reasoning. It is helpful for different competitive examinations

PHIG- SEC-A : Business Ethics

It is a form of professional ethics, ethics is normative science. But the application of ethics in practical life specially in business we need codes of ethics which ensure an organization to run smoothly. It guides us with the principles of ethics like loyalty, fairness, integrity, trust.

SEMESTER-IV

PHIG-CC-4: Philosophy of mind

The basic concepts of sensation, introspection and the learning methods are enriched students knowledge. Psychological aspects of this topic given a clear view about the inner world towards students.

PHIG-SEC-B : Man and Environment

Environmental Philosophy: Environmental philosophy is the discipline in philosophy that studies the moral relationship between human beings and nature, as well as the value and moral status of environment. Study of environmental philosophy teaches the students how to conserve our world and manage our natural resources to meet our increasing needs and wants.

Eco-feminism : Eco-feminism is a study of combining two branches of ecology and feminism. Where nature is compared with a women. It helps the student to examine the effect of gender categories in order to demonstrate the ways in which social norms event unjust dominance over women and nature.

BA Part- III (1+1+1)- 2009 regulations

Philosophy

Core Outcomes (Honours course)

Paper- V: Indian logic and epistemology

It developed logical realism. Students can acquire true knowledge of reality which is based on logical ground not mere on intuition or faith. Also create a sense of spiritualism in the mind of the students.

Paper-VI: Philosophy of language, epistemology and metaphysics (western):

students can learn the relationship between nature of language and the world. It develops an idea fundamental properties of being with nature. It help students to explore the sources, nature, limits and criteria of knowledge.

PAPER- VII: Ethics and Philosophy of Religion

Ethics: Ethics belongs to normative science. It is called moral philosophy, it is concerned with what is morally good and wrong. It helps us to make practical decisions and its major concerns include the nature of ultimate value and the standards by which human actions can be judged right or wrong.

Philosophy of Religion: Philosophy of Religion has an important role in helping human beings understand and evaluate different religious traditions, beliefs, philosophical traditions. It concerned with the philosophical appraisal of human religious attitudes.

PAPER-VIII : HUME

Hume is regarded as one of the most influential empiricist philosopher. Though he seemed as an extreme empiricist philosopher but from his writing it is evident that he appeals to mankind that we should behave

human being first, then one can be a philosopher. Hume could be a constructive, since he accounted for human understanding of nature, it help students about knowing the understanding of human nature.

Core Outcomes(General course)

PAPER-IV: Social- political philosophy and contemporary Indian thought

Social political philosophy: it developed senses of internationalism on students. Also developed social attitudes. Students can acquire knowledge of civilization. Students can improve the sense of equality, liberty, justice etc.

Contemporary Indian philosophy: students can know the foundation of modern ethics in social perspective. It can develop philosophical and religious views of the world. Students can learn the process of social, political views and rules of civil society.

Department of Physics
Netaji Nagar College for Women, Kolkata-700092

PROGRAMME SPECIFIC OUTCOMES OF PHYSICS GENERAL:

Completion of Physics general course would provide the opportunity to the students:

- To understand the basic laws and explore the fundamental concepts of physics
- To understand the concepts and significance of the various physical phenomena.
- To carry out experiments to understand the laws and concepts of Physics.
- To apply the theories learnt and the skills acquired to solve real time problems.
- To enhance the student's academic abilities, personal qualities and transferable skills this will give them an opportunity to develop as responsible citizens.
- This course introduces students to the methods of experimental physics. Emphasis will be given on laboratory techniques specially the importance of accuracy of measurements.
- Providing a hands-on learning experience such as in measuring the basic concepts in properties of matter, heat, optics, electricity and electronics.

Department of Physics
Netaji Nagar College for Women, Kolkata-700092

1. Course Outcome of Physics General (Under CBCS)

Sl.	Semester	Course Code/Paper Code PHSG	Course Name	Course Outcome
1.	Sem-1	PHS-G-CC-1-1-TH	Mechanics (Theory)	• To understand the behaviour of physical bodies it provides the basic concepts related to the motion of all the objects around us in our daily life. • The course builds a foundation of various applied field in science and technology; especially in the field of mechanical engineering. • To study vectors, laws of motion, momentum, energy, rotational motion, gravitation, fluids, elasticity and special relativity.
		PHS-G-CC-1-1-P	Mechanics (Practical)	• Students would perform basic experiments related to mechanics and also get familiar with various measuring instruments would learn the importance of accuracy of measurements.
2.	Sem-2	PHS-G-CC-2-2-TH	Electricity and Magnetism (Theory)	• It gives an opportunity for the students to learn about one of the fundamental interactions of electricity and magnetism, both as separate phenomena and as a singular electromagnetic force. • The course contains vector analysis, electrostatics, magnetism, electromagnetic induction and Maxwell's equations. • The course is very useful for the students in almost every branch of science and engineering.
		PHS-G-CC-2-2-P	Electricity and Magnetism (Practical)	• Students would gain practical knowledge about electricity and magnetism and measurements such as: Resistance, Voltage, current etc.
3.	Sem-3	PHS-G-CC-3-3-TH	Thermal Physics and Statistical Mechanics (Theory)	• To understand the basic physics of heat and temperature and their relation with energy, work, radiation and matter. The students also learn how laws of thermodynamics are used in a heat engine to transform heat into work. • The course contains the study of laws of thermodynamics, thermodynamic description of systems, thermodynamic potentials, kinetic theory of gases, theory of radiation and statistical mechanics.

		PHS-G-CC-3-3-P	**Thermal Physics and Statistical Mechanics (Practical)**	• **Students would gain practical knowledge about heat and radiation, thermodynamics, thermo emf etc. and perform various experiments.**
		SEC A-2 (PHS-A SEC-B-TH)	**Renewable energy and Energy Harvesting (Theory)**	• **After completion of the course, every student is exposed to various wastes recycling and renewable energy based efficient technologies. Practical exposure to analyse basic parameters of waste and waste management techniques is also provided.**
4.	**Sem-4**	**PHS-G-CC-4-4-TH**	**Waves and Optics (Theory)**	• **The course comprises of the study of superposition of harmonic oscillations, waves motion (general), oscillators, sound, wave optics, interference, diffraction, polarization.** • **The course is important for the students to make their career in various branches of science and engineering, especially in the field of photonic engineering.**
		PHS-G-CC-4-4-P	**Waves and Optics (Theory)**	• **The practical knowledge of wave motion doing experiments: Tuning fork, electric vibrations. They would also learn optical phenomena such as interference, diffraction and dispersion and do experiments related to optical devices: Prism, grating, spectrometers**
		PHS-A SEC-B -TH	**Electrical Circuits and Network skills (Theory)**	• **To understand the unknown elements of a circuit, such as voltage, current, resistance, impedance, power, among others, across its component.** • **To understand the electrical quantities, relationships, theorems, and some essential laws.**

2. Course Outcome of Physics General (Under Old Syllabus)

Sl.	Part	Course Code/Paper Code PHSG	Course Name	Course Outcome
1.	Part-III	IVA	Application of Thermodynamics, Energy Sources, Electronics, Communications	• To understand production and measurement of high vacuum and working mechanism of different engines, pumps etc. around us in our daily life. • The course builds a foundation of various applied field in conventional and non-conventional energy resources. • To understand digital electronics applications, cathode-ray oscilloscope, digital multimeter, L and C measurements.
		IVB	Laboratory	• Students would perform basic projects or experiments related to OP-AMP, ammeter-voltmeter conversion and Phototransistor construction and practical applications possibilities.
			Computer Lab	• To understand and familiarise with the hardware and the operating system and to solve simple problems by programming in C or FORTRAN.

B.Sc. (Honours) in PHYSIOLOGY Programme Specific Outcome:

The undergraduate Honours syllabus in Physiology under the University of Calcutta is so versatile that a student, graduated with Honours in Physiology may find himself / herself suitable in most of the fields of Biological Sciences. Perhaps the Undergraduate Board of Studies in Physiology do not want to lose the essence of the age old subject in the recent days of modernization. Thus, the syllabus is designed in such a way that a student reads old experimental approaches viz. localization of motor cortex, respiratory center in one semester along with cutting edge techniques viz. polymerase chain reaction, western blot etc. in other semesters. The undergraduate Honours Syllabus in Physiology represents the finest example of the combination of old and new knowledge. The undergraduate honours programme specific outcomes are discussed below:

On successful completion of Undergraduate Honours Course in Physiology or B.Sc. Honours in Physiology (*3 years*), a student –

PSO.1: Should have gained knowledge in Physiology through theory and practical classes.

PSO.2: Should have gained hands on training on biochemical experiments.

PSO.3: Should have learnt the basic principles of advance analytical methods.

PSO.4: Should have developed research oriented skills.

PSO.5: Should have received training to finish assignments within time.

PSO.6: Should have gained knowledge on data collection, statistical analyses and data interpretation.

PSO.7: Should be able to nurture the zeal to serve the society.

PSO.8: Should have gained sufficient knowledge to serve in the government organizations such as Defense Research and Development Organisation (DRDO), All India Institute of Medical Sciences (AIIMS), National Institute of Science Education and Research (NISER), Indian Institute of Technology (IITs), National Institute of Technology (NIT), Sports Authority of India (SAI) and various other institutes of academic excellence in the capacity of Scientist, Research Associate, Research Assistant, Project staff etc. The students have similar opportunities in the private sectors such as R & D sections, research and analysis wings of Pharmaceutical companies, sales and marketing of pharmaceutical products, nutritional supplements, prosthetics etc. The graduate students of Physiology have an edge over other Biological Sciences or Life Science graduates, if they proceed for professions like Sports Physiologist, ECG or EEG technician, Physiotherapist, Medical Imaging laboratory technician, Operation Theater technician, Assistant in Neurophysiology Laboratory, Optometrist, Audiology and Speech therapist etc. which are essentials in hospitals, diagnostic labs and other health sectors.

B.Sc. (General) in PHYSIOLOGY Programme Specific Outcome:

The Undergraduate General Syllabus in Physiology under the University of Calcutta is so designed that it can complement other subjects to enrich the knowledge of a student pursuing B.Sc. General (*3years*) course. The course is flexible and allows students to learn theoretically and also to achieve some practical skills. The student should be able to utilize the knowledge which would help them to establish themselves in future. The programme specific outcomes are outlined below:

On successful completion of Undergraduate General Course in Physiology or B.Sc. General in Physiology (*3 years*), a student –

PSO.1: Should be able to gain knowledge on structure and function of different parts of human body.

PSO.2: Should have developed understanding to detect early signs of any abnormality which arises due to a pathology in the human body.

PSO.3: Should have gained sufficient knowledge to serve in the government or private sector such as diagnostic laboratories, hospitals, forensic laboratories under Ministry of Health and pharmaceutical companies, research & development sectors, sales & marketing department in the privates sectors for employability.

Semester / Year of studies	Course ID & Title	Outcomes After completion of these courses students should be able to;
SEMESTER - I (Honours)	CC-1: Cellular Basis of Physiology, Genetics & Enzymes	CO.1: Explain the structure and functions of an animal cell and its organelles. CO.2: Understand genetic inheritance. CO.3: Gain knowledge on biological catalysts and their mechanism of actions.
	CC-2: Biophysical Principles and Chemistry of Biomolecules	CO.1: Understand the biophysical properties of biomolecules. CO.2: Follow the chemical nature of biomolecules in depth.
SEMESTER – I (General)	CC-1 / GEN-1: Cellular Basis….Digestion, Absorption & Metabolism	CO.1: Explain the structure and functions of an animal cell and its organelles. CO.2: Understand genetic inheritance. CO.3: Gain knowledge on biological catalysts. CO.4: Understand the biophysical properties & chemical nature of biomolecules. CO.5: Understand digestion, absorption & metabolism in brief.
SEMESTER - II (Honours)	CC-3: Cell signaling & Nerve-muscle Physiology	CO.1: Understand how the exogenous and endogenous molecules can exert structural and functional changes within a cell. CO.2: Follow the structure & function of nerve, muscle and the underlying molecular mechanism of muscular contraction.
	CC-4: Nervous System	CO.1: Understand the most sophisticated controlling mechanism present in human body – The Nervous System. CO.2: Follow different functions of the nervous system. CO.3: Identify different parts of the nervous system associated with higher functions, such as emotion, sleep, speech etc.
SEMESTER – II (General)	CC-2 / GEN-2: Blood body fluids, Cardiovascular & Respiratory System	CO.1: Follow the composition and function of Blood. CO.2: Gain knowledge about the anatomy & function of heart and vasculature. CO.3: Understand the anatomy and functions of respiratory system.

SEMESTER – III (Honours)	CC-5: Blood and Body Fluids	CO.1: Understand the composition and primary functions of blood, such as maintenance of homeostasis, transport, coagulation, blood grouping etc.
	CC-6: Cardiovascular System	CO.1: Understand anatomy of heart, structure of blood vessels, their normal functionality and pathology.
	CC-7: Respiratory System	CO.1: Follow the anatomy of lung, its function and the overall mechanism of respiration, including gaseous exchange, non-respiratory functions etc.
	SEC-A1: Hematological Technique OR SEC-A2: Clinical Biochemistry	CO.1: Perform different experiments such as blood grouping and interpreting the results of different experiments viz. thalassemia screening, TC, DC, ESR etc. OR CO.1: Perform and analyses the result of different biochemical tests, which includes blood, urine and body fluids.
SEMESTER – III (General)	CC-3 / GEN-3: Nerve-muscle Physiology….. Special Senses	CO.1: Follow different functions of the nervous system. CO.2: Understands the functions of Vision, Audition, Gustation, Olfaction.
	SEC-A1: Microbiology & Immunology OR SEC-A2: Clinical Biochemistry	CO.1: Follow the basic principles of Bacteriology, Virology, mycology, parasitology & Immunology. OR CO.1: Perform and analyses the results of different biochemical tests.
	CC-8: Digestion and Metabolism	CO.1: Understand the anatomy and functions of digestive System. CO.2: Gain knowledge on energy metabolism and generate a brief idea on system biology.
	CC-9: Molecular	CO.1: Acquire knowledge in depth on genetic material

SEMESTER – IV (Honours)	Biology	present in a living cell. CO.2: Understand how the genetic material is inherited, duplicated, transcribed and translated in several thousands of proteins with in cell. CO.3: Gather information on different regulators of genes, recombinant DNA technology, genetic engineering and the associated techniques.
	CC-10: Nutrition Dietetics Public Health	CO.1: Acquire an overall idea about nutrition. CO.2: Understand the importance of different components of balanced diet and their significances. CO.3: Prepare diet charts for normal individuals and for persons suffering from different disease conditions, such as diabetes, hypertension etc.
	SEC-B1: Detection of Food Additives / Adulterants & Xenobiotics OR SEC-B2: Bioinformatics	CO.1: Perform different tests in order to detect different adulterants in common food stuffs, either added inadvertently or for business purpose. OR CO.1: Perform simple and complex analyses of different data sets, Pattern searching, analyses and interpretation. CO.2: Apply different bioinformatics tools such as FASTA, BLAST etc.
SEMESTER – IV (General)	CC-4 / GEN-4: Endocrinology, Reproductive & Excretory Physiology	CO.1: Understand in brief the most ancient regulatory mechanism present in the human body. CO.2: Gain knowledge on reproductive system. CO.3: Develop understanding on different excretory pathways, homeostasis, body water balance etc.
	SEC-B1: Detection of Food Additives / Adulterants & Xenobiotics OR SEC-B2: Community Health & Formulation of Diet Charts	CO.1: Gain knowledge on food adulterants and associated health hazards. CO.2: Acquire information on xenobiotics & its metabolism. OR CO.1: Understand what a community is and the related health issues. CO.2: Identify problems of higher population, issues with family planning, ART etc. Principles of formulation of diet charts for normal, pregnant and lactating mothers are an important component of the course.

PART – III (Honours – Old Syllabus)	Paper-V: Unit-09	CO.1: Gain a thorough knowledge on endocrinology which includes chemical composition and mechanism of hormone action, and their effects on human body. Students will also be acquainted with the conditions arise due to the hypo and hyperactivity (pathology) of the endocrinal glands. CO.2: Understand biological rhythms which is influenced by the environmental cues and internal biological clock. Study of biological rhythm is essential to understand sleep-wake fullness cycle, jet lag and many other events experienced in our day to day life.
	Paper-V: Unit-10	CO.3: Acquire knowledge on reproductive system in depth. CO.4: Develop an understanding on how an embryo forms grows from one cell stage to an adult individual with billions of cells. CO.5: Understands the proper importance of balanced diet for growth, development and activities. CO.6: Gain knowledge on communities and take appropriate steps to intervene community based health issues.
	Paper-VI: Unit-11	CO.1: Understand the harmonious relation among man, instrument and workplace, which also mitigates the risk of professional health hazards. CO.2: Follow the physiology behind different types of sports, which enables the students to understand and frame the training procedure for individual sports personnel. CO.3: Gain knowledge on body temperature control and learn to act on different environmental cues.
	Paper-VI: Unit-12	CO.4: Gain a thorough knowledge on the basic principles of bacteriology, virology, mycology, parasitology & immunology. CO.5: Acquire knowledge on human body and drug interaction and other concepts such as therapeutic dose, efficacy, biotransformation, LD_{50}, ED_{50} etc. CO.6: Gain knowledge on statistical methods which include data analysis, hypothesis testing, data interpretation etc.
	Paper-VII: Unit-13 (Practical)	CO.1: Perform biochemical tests for blood sugar, serum protein, serum urea etc. CO.2: Perform and understand the effects of different ions on the normal activity of mammalian heart. CO.3: Perform gram staining for bacteria and interpret it accordingly.

	Paper-VIII: Unit-14 (Practical)	CO.1: Perform histological staining of normal mammalian tissues and interpret it. CO.2: Perform and demonstrate the normal intestinal movements and effect of different drugs on the intestinal movement of mammalian tissue. CO.3: Perform different human experiments including blood pressure measurement, anthropometric measurements, calculation of body surface area, body mass index etc.
PART – III (General – Old Syllabus)	Paper – IVA: & Paper – IVB:	CO.1: Develop idea about hematology, biochemistry, molecular biology, microbiology & immunology, social physiology, work physiology, environmental physiology and biostatistics. & CO.1: Perform hematological experiments which includes TC, DC, bleeding & coagulation time, blood grouping etc. CO.2: Perform biochemical tests which includes detection of normal constituents in urine. CO.3: Determine some common anthropometric parameters including height, weight, BMI etc. as part of human experiments.

PROGRAM OUTCOME: POLITICAL SCIENCE HONOURS (SEMESTER SYSTEM)

The courses help students to

PO1. Acquire an in-depth knowledge about the origin and evolution of the subject.

PO2. Both the empirical and value- based approaches to the study of Political Science encourages a student to take into consideration the existing facts and the prevalent values while solving a problem.

PO3. Encourage students to generate research questions by themselves on the basis of certain existing facts and analyse the same to arrive at problem specific solutions.

PO4. Inculcate interest among students not only on the topics covered, but also on other associated sub topics, and encourage them to undertake broader analysis beyond text books, through departmental webinars and students' curricular activities like poster presentation etc.

PO5. The course offers multi dimensional career option for students with varied interests like Teaching (School Service Commission, National Eligibility Test, State Level Eligibility Test etc.), Administration (WBCS, IAS,IFS and IPS), Consulate Services, media jobs (print and electronic) etc.

PROGRAM SPECIFIC OUTCOME:

PSO1. Respect for laws and the Constitution: Enables students to acquire thorough knowledge about the laws and the Constitution of India, make a comparative study of the Constitution with that of other countries and thereby generate respect for the same.

PSO2. Consciousness about social problems: The DSE papers help to generate awareness about the various social security threats our country is suffering from, like problems of caste, communalism, gender inequalities etc. and make a comparative study with that of other countries.

PSO3. Generating Awareness about the working of various Government institutions and the Parliament: The SEC papers disseminate detailed information about various government institutions like the functions of the Panchayat System, District Courts or Fast- Track Courts etc., thereby creating well informed citizens.

PROGRAM OUTCOME: POLITICAL SCIENCE GENERAL (SEMESTER SYSTEM)

The course help to

PO1. Generate Respect for the Motherland and the Constitution: A detailed study of the background and the evolution of the Constitution and the provisions incorporated therein, students become aware of the rights the citizens of the country are entitled to, creating a sense of oneness and respect for the Constitution.

PO2: Create Social Awareness: Make students aware of the prevalent social evils like caste, class, communal problems and gender inequalities plaguing the country at present and try to apply the solutions at micro level, for example in a particular locality or within the family.

PO3: Strive to achieve social harmony: Enabling students to identify the various sources of disharmony in society like caste and religion, the students strive to overcome the issues to cultivate a spirit of social harmony.

PO4: Strives to enhance mental agility and a spirit of investigation among students through departmental webinars and various students' curricular activities like poster making, tutorial projects etc.

PO5: Opportunities for Higher studies and Job Prospects: The course provides various job opportunities like teaching (can appear for School Service Commission Entrance Examination and Primary School teaching), administrative jobs (Can appear for competitive examinations like WBCS, IAS or IPS), jobs in media, both print and technology, service to various NGOs etc.

PROGRAM SPECIFIC OUTCOME: POLITICAL SCIENCE GENERAL

PSO1: Political Education: The curriculum include topics like political parties and pressure groups in India and other countries of the world, the various methods of election etc. , thus helping to develop politically educated citizens.

PSO2: The DSE paper: The curriculum of the DSE paper of semester 1 becomes all the more significant in the backdrop of a woman's college as it deals with topics like patriarchy and sex-gender debate and how it manifests itself in the context of family , state and community. The syllabuses make students aware of the women's movements and help to generate consciousness about the various injustices towards women in the form of violence against women, visible and invisible labour etc.

PSO3: The Sec papers: deal with various elementary concepts like research design and purpose of research, techniques of data collection and statistical data analysis etc. thus, preparing them for job opportunities in media and NGOs.

PROGRAM OUTCOME: POLITICAL SCIENCE GENERAL, (1+1+1 SYSTEM)

The course help students to

PO1. Generate respect and love for the Motherland: Uphold the lofty ideals of our country like anti - colonialism, anti –racialism, non alignment etc and thereby generate respect for the Motherland.

PO2. Garner knowledge about the developments of major concepts in the international arena in the context of India: Create awareness about the merits and demerits of globalization with special reference to India, an idea of the concept of Human rights and its prospects and violations in India etc.

PO3: Ability to protect the rights of others through knowledge gathered: The curriculum includes the functions of the State and National Human Rights Commission which enables the students to redress their grievances to the concerned authorities and help others to do the same.

PO4: Inculcating the value of peace: The course includes the role of United Nations in the maintenance of world peace and the significant role played by India therein, thus motivating students to value the importance of peace and peaceful coexistence.

PO4: Understanding the present role played by India in the international political arena: On the basis of the idea formed from the topics included in the course on the determinants of India's Foreign Policy the students can understand and analyse India's role in global affairs.

NETAJINAGAR COLLEGE FOR WOMEN, KOLKATA=92

DEPARTMENT OF POLITICAL SCIENCE

COURSE OUTCOME OF POLITICAL SCIENCE (H)

Sl.	Semester	Course Code (PLSA)	Course Name	Course Outcome (CO) *After the successful completion of the course the student will be able-*
1.	SEM 1 (JULY TO DEC)	CC1 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Understanding Political Theory: Concepts	CO1- to acquaint the students of the foundational concepts of politics and political science. CO2- to help students navigate the vocabulary and practice of politics
		CC2 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Understanding Political Theory: Approaches and Debates	CO1-to understand the broad theoretical concepts and the debates surrounding politics CO2- to have a preliminary understanding of positivist and post positivist theories CO3- to acquire knowledge about Marxist and neo-Marxist schools of thought
2.	SEM 2 (JAN TO JUNE)	CC3 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Constitutional Government in India	CO1-to learn the evolution and functioning of the Indian Constitution in details CO2- to relate the subject matter to current political affairs
		CC4 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Politics in India: Structures and Processes	CO1- to learn major aspects of the functioning of Indian Politics in details CO2- to relate the subject matter to current political affairs CO3-to evaluate the role of important social movements on Indian politics
3.	SEM 3 (JULY TO DEC)	CC5 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Indian Political Thought- 1	CO1-to learn major approaches of Indian political thought starting from the ancient period through to modern India CO2-to understand the difference between Indian and Western political ideas CO3-to acquire values of morality, tolerance and pluralism
		CC6 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Comparative Government and Politics	CO1- to learn the theoretical foundations of comparative politics CO2-to compare political systems of different countries CO3-to understand the relevance of a comparative contextual analysis and method in political studies

		CC7 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Perspectives on International Relations	CO1-to understand the evolution of International relations as an academic discipline CO2-to analyze emergent issues in global affairs CO3-to understand the growth and trajectory of Indian foreign policy
		SEC A1 **Full marks=100** **Credit=2**	Democratic Awareness through Legal Literacy	CO1-to make the students learn about the legal measures and the judicial system prevalent in India CO2-to make them aware of their rights and the legal tools at hand to fight against social injustices
4.	SEM 4 (JAN TO JUNE)	CC8 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Indian Political Thought- 2	CO1-to learn major approaches of modern Indian political thought CO2-to understand the interconnections between nationalism and Indian political philosophy CO3- to understand its relevance in the present context
		CC9 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Global Politics Since 1945	CO1-to understand and analyze First and Third World global politics CO2-to evaluate the role of major institutions of global governance CO3- to understand the trajectory and significance of India's relations with her neighbors
		SEC B2 **Full marks=100** **Credit=2**	Elementary Aspects of Social Research	CO1-to understand the basic aspects of research methodology CO2-to study about the designs, methods and approaches of political inquiry

NETAJINAGAR COLLEGE FOR WOMEN, KOLKATA=92

DEPARTMENT OF POLITICAL SCIENCE

COURSE OUTCOME OF POLITICAL SCIENCE (H)

Sl.	Semester	Course Code (PLSA)	Course Name	Course Outcome (CO) *After the successful completion of the course the student will be able-*
1.	SEM 1 (JULY TO DEC)	CC1 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Understanding Political Theory: Concepts	CO1- to acquaint the students of the foundational concepts of politics and political science. CO2- to help students navigate the vocabulary and practice of politics
		CC2 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Understanding Political Theory: Approaches and Debates	CO1-to understand the broad theoretical concepts and the debates surrounding politics CO2- to have a preliminary understanding of positivist and post positivist theories CO3- to acquire knowledge about Marxist and neo-Marxist schools of thought
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		CC4 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Politics in India: Structures and Processes	CO1- to learn major aspects of the functioning of Indian Politics in details CO2- to relate the subject matter to current political affairs CO3-to evaluate the role of important social movements on Indian politics
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		CC6 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Comparative Government and Politics	CO1- to learn the theoretical foundations of comparative politics CO2-to compare political systems of different countries CO3-to understand the relevance of a comparative contextual analysis and method in political studies

		CC7 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Perspectives on International Relations	CO1-to understand the evolution of International relations as an academic discipline CO2-to analyze emergent issues in global affairs CO3-to understand the growth and trajectory of Indian foreign policy
		SEC A1 **Full marks=100** **Credit=2**	Democratic Awareness through Legal Literacy	CO1-to make the students learn about the legal measures and the judicial system prevalent in India CO2-to make them aware of their rights and the legal tools at hand to fight against social injustices
4.	SEM 4 (JAN TO JUNE)	CC8 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Indian Political Thought- 2	CO1-to learn major approaches of modern Indian political thought CO2-to understand the interconnections between nationalism and Indian political philosophy CO3- to understand its relevance in the present context
		CC9 **Full marks=100** **Credit=6** **(Th:5+Tu:1)**	Global Politics Since 1945	CO1-to understand and analyze First and Third World global politics CO2-to evaluate the role of major institutions of global governance CO3- to understand the trajectory and significance of India's relations with her neighbors
		SEC B2 **Full marks=100** **Credit=2**	Elementary Aspects of Social Research	CO1-to understand the basic aspects of research methodology CO2-to study about the designs, methods and approaches of political inquiry

NETAJI NAGAR COLLEGE FOR WOMEN

DEPT OF POLITICAL SCIENCE

COURSE OUTCOME OF POLITICAL SCIENCE (GEN)

SEMESTER SYSTEM

Sl.	***Semester***	***Course Code* PLSG**	***Course Name***	***Course Outcome (Cos)*** *After the successful completion of the course the student will be able to*
1.	Sem -1 *(July to December)*	C-C-1/ G.E-1	*Introduction to Political Theory (6credits) Th: 5+Tu: 1*	**CO1:** Form an idea about the nature and scope of the subject and trace the evolution of Political science through the study of various approaches. **CO2:** Trace the evolution of the state through the various theories regarding its origin. **CO3:** Acquire knowledge about certain fundamental concepts like laws, rights, liberty, equality and different theories of Sovereignty. **CO4:** Become well aware of the key concepts of Political Science like Nationalism, Internationalism and Democracy. **CO5:** Derive knowledge about Marxism and theories associated with it, including the idea of imperialism. **CO6:** Acquires a thorough understanding of the working of democracy through a study of the essential concepts related to Democracy like Political Parties, Pressure Groups and Methods of Representation.
2.	Sem-2 *(January-June)*	C-C-2/ G.E-2	*Comparative Government and Politics (6credits) Th: 5+Tu:1*	**CO1**: Become aware of the various types of political systems in the international arena. Through a comparative study of the systems they are able to understand the points of convergences and divergences, thus, helping them to understand the causes of conflict and cooperation between them. **CO2:** Analyse the different features of the major democracies of the world and a make a comparison between them. **CO3:** Better understanding of the role played by the major powers in world politics through a study of their governmental institutions, like the Parliament, Political Parties, Pressure Groups etc.

				CO4: Able to get a clear idea about how a socialist government works through a thorough analysis of the working of the major governmental institutions of China. It enables the students to trace the background of the Great Revolution in China, and delve into the constitutional evolution of the country. **CO5:** Form an idea about the ideological differences between the major powers, which can motivate them to think beyond the prescribed curriculum regarding the different causes of conflict and ways of Conflict Resolution. **CO6:** Generate respect for the Constitutions of the major countries of the world through a study of the lofty ideals the Constitutions uphold.
3.	<u>Sem-3</u> *(July to December*	C-C-3/ G.E-3	*Government and Politics in India (6credits)* *Th: 5+Tu:1*	**CO1:** Acquire a thorough idea of the historical background and the evolution of the Constitution of India. **CO2:** Have an understanding of the high ideals of the Constitution as mentioned in the Preamble to the Constitution. **CO3:** Generate awareness about the Fundamental Rights the students are entitled to as the citizens and the Fundamental Duties they are supposed to perform. **CO4:** Develops a clear idea of the nature of Indian Federal system and the Centre State Relations. **CO5:** Become aware of the functions of the three branches of the Government, ie, Executive, Legislature and the Judiciary, the work procedure within the Parliament like the steps involved in the conversion of a Bill to an Act. **CO6:** Create awareness about the challenges against the Indian Government in the form of the various social and political movements like environment, caste, tribes, etc and the problem of Regionalism plaguing India.
4.	Sem-3	SEC 3 A(1)	*Legal Literacy (2 Credits)* *Full Marks 100*	**CO1:** Becomes aware of the concept and major processes of detention, Arrest, Search Bail etc. **CO2:** Becomes well acquainted with the history of Indian Penal Code and certain major aspects like protection of Primary and Secondary Personal Rights, Criminal Conspiracy, Offences against the Sate and those relating to marriage etc . **CO3:** Becomes aware about certain important laws like

				Anti Terror Laws, Human Rights Laws and Consumer Rights Laws.
	Sem-4 *(January-June)*	C-C-4/ G.E-4	*International Relations (6 credits) Th: 5+ Tu: 1*	**CO1:** Have an idea about the growth of International Relations as a field of study. **CO2:** Have a comprehensive knowledge about the various approaches to International Relations beginning from Classical Realism to Structural Approaches like Dependency School and World Systems Approach. **CO3:** Acquire knowledge about some major developments i8n International Relations like the causes for the origin and end of the Cold War, the emergence of détente etc. **CO4:** Become aware of the origin of the Non Alignment Movement with reference to the Summits that have taken place so far.
	Sem-4	SEC 4 B(1)	*Elementary Dimensions of Research (2 Credits) Full Marks: 100*	**CO1:** Derives idea about the basic concepts propositions, hypothesis and variables **CO2:** Gets an idea about Research Design, units of analysis and an idea about Fallacies. **CO3:** Derives an understanding about certain issues like ethics in Research and learns to write Research Report Writing. **CO4:** Acquire formative ideas about Qualitative and Quantitative Data Collection, Sampling and statistical method of data analysis.

NETAJI NAGAR COLLEGE FOR WOMEN

DEPT OF POLITICAL SCIENCE

COURSE OUTCOME OF POLITICAL SCIENCE (GEN)

1+1+1 SYSTEM

Sl	***Year***	***Course Code*** **PLSG**	***Paper***	***Course Outcome (Cos)*** *After the successful completion of the course the student will be able to*
1	Third	PLSG	PAPER IV Full Marks: 100	CO1: Acquire a general idea about the concept of Foreign Policy, the goals and determinants of the foreign policy of India. CO2: Have an understanding of the concepts like Human Rights and their prospect and the merits and demerits of Globalisation in the Indian context. CO3: Have a thorough knowledge about United Nations Organisation, the powers and functions of its organs, and the role played in maintenance of world peace. The students also get informed about the role played by India in maintenance of world peace. CO4: Derives an idea about the decentralized bodies of the Government, both at the urban and the rural level namely the Municipal Corporation and the Gram Panchayat and the functions of the various tiers. CO5: Gets an idea about the various motions in practice within the parliament.

Netaji Nagar College for Women
Department of Zoology
PROGRAM SPECIFIC OUTCOME

The scope of **Zoology** as a subject is very broad. Graduates of the **B.sc Zoology program** are expected to:

PSO1. Gain theoretical in-depth knowledge on the key areas of study within the disciplinary/subject area of Zoology that comprise - animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology and biochemistry, genetics and evolutionary biology, animal biotechnology, applied zoology, behavior, immunology, reproductive biology, and insect, vectors and diseases.

PSO2. Become technically competent to perform various experiments that are covered in the curriculum.

PSO3. Acquire capability for asking relevant/appropriate questions relating to issues and problems in the field of Zoology, besides understanding, analysing and interpreting data generated in life sciences related experiments or investigations.

PSO4. Develop effective communication skills for the dissemination of scientific knowledge relating to Zoology in a clear and concise manner through written, oral and multimedia/technology-based formats.

PSO5. Look for engagements in industry and commercial activities employing Life Sciences, Molecular Biology and Biotechnology. They may also be interested in entrepreneurship and start some small business based on their interest and experience.

PSO6. Look forward to a career/ profession related to Zoology, including research and development, teaching, government/ public service or even private sectors.

Netaji Nagar College for Women
Department of Zoology
COURSE OUTCOME (Zoology Honours)

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
1.	I	SEM-I	CC 1 CC1-1-TH	Non-Chordates I: Protists to Pseudocoelomates Full Marks: 50 Credit: 4	**Unit 1:** Provide basic knowledge about Taxonomic rules of animal Classification.
					Unit 2: Learn about Protozoans with Classification up to phylum, Life cycle and pathogenicity of selected protozoan Parasites. Evolutionary significance of Metazoa.
					Unit 3: Classification of Porifera upto classes, with general idea on it & its canal system.
					Unit 4: Basic information on Cnidarians along with its classification upto classes, Metagenesis, Coral reef, formation & significance.
					Unit 5: General idea on Ctenophora.
					Unit 6: Basic information on Platyhelminthes along with its classification upto classes. Life cycle, pathogenicity & control measure of selected Platyhelminth Parasites.
					Unit 7: General Characters, Classification of Nematodes upto classes. Life cycle, pathogenicity & control measure of selected Parasitic nematodes. Parasitic adaptation of Helminthes.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
2.	I	SEM-I Full Marks: 30 Credit: 2	CC1-1-P	Non-Chordates I: Protists to Pseudocoelomates Lab	Study of whole mount of selected Protozoans. Identification with reason & Systematic position of selected Protists to Pseudocoelomates. Staining/mounting of any protozoa/helminth.

Overall Outcome of the course CC1-1:	**CO1.** Clear idea on Basic classification concept. **CO2.** Familiarity with the non- chordate world surrounding us & its importance. **CO3**. Developing student's ability to identify the invertebrates and classify them up to the class level on the basis of systematic position. **CO4.** Appreciating the process of evolution (unicellular cells to complex, multi cellular organisms). **CO5.** Understand the basis of life processes in the non-chordates. **CO6.** Awareness among students about coral reefs & its impact on our environment. **CO7.** Awareness among students on various important parasites and diseases spread by them in human with the help of study of host-parasite relationship. **CO8.** Understand various diseases causing vectors like Mosquitoes.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
3.	I	SEM-I	CC 2 CC1-2-TH	Molecular Biology Full Marks: 50 Credit: 4	**Unit 1:** Basic knowledge on Nucleic Acids.
					Unit 2: Basic information on DNA replication, RNA priming.
					Unit 3: Mechanism of Transcription.
					Unit 4: Idea on Genetic code and Translation.
					Unit 5: Detailed knowledge on processing of RNA including RNA editing.
					Unit 6: Study about gene regulation.
					Unit 7: DNA repair mechanisms found in Prokaryote and eukaryotes.
					Unit 8: Idea about several molecular techniques.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
4.	I	SEM-I Full Marks: 30 Credit: 2	CC1-2-P	Molecular Biology Lab	Study of polytene, lampbrush chromosomes, how to isolate and quantify genomic DNA and run Agarose gel and stain nucleic acids in histological slides.

Overall Outcome of the course CC1-2:	Students will be able to develop: **CO1**. Clear concept about structure, features, types and properties of Nucleic acids. **CO2.** Understanding the process and mechanism of replication, transcription and translation of Nucleic acids in both prokaryotes and eukaryotes. **CO3**.Theoritical knowledge on advanced molecular techniques that are currently in use in various laboratories. **CO4**. Concept about RNA modifications. **CO5.** Idea about how operons function, DNA repaired in case of any damage. **CO6.** Practical knowledge on how genomic DNA can be isolated from tissues and visualized.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
5.	I	SEM-II	CC 3 CC2-3-TH	Non-Chordates II – Coelomates Full Marks: 50 Credit: 4	**Unit 1:** Gather knowledge on evolution of coelom.
					Unit 2: Basic information on Annelids along with its classification upto classes, Metamerism, Excretion procedure through nephridia.
					Unit 3: Classification of Arthropoda upto classes, with general idea on it & Respiration, vision, metamorphosis & social life of selected arthropods.
					Unit 4: General characters & evolutionary significance of Onychophore.
					Unit 5: Basic information on Molluscans along with its classification upto classes. Feedng respiration, torsion & nervous system of a selected one belong to Phylum Mollusca.

					Unit 6: Basic information & Classification of Phylum Echinodermata upto classes, Water vascular system in selected one, Echinoderm larva & their affinities with Chordates.
					Unit 7: Hemichordates a brief idea, Relationship of it with both chordates & non chordates.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
6.	I	SEM-II Full Marks: 30 Credit: 2	CC2-3-P	Non-Chordates II – Lab	Study of selected Annelids, Arthropods, Mollusca & Echinoderms. Anatomy study of selected invertebrates.

Overall Outcome of the course CC2-3:	**CO1.** Clear idea on the process of evolution (non-coelomate to coelomates), formation of complex body organization than previous phylum & on the door step to form chordates next. **CO2**. Familiarity with the chordate world surrounding us, their importance, special features & affinities with chordates according to their evolutionary status. **CO3.** Developing student's ability to identify the invertebrates and classify them up to the class level on the basis of systematic position. **CO4.** Understand the basis of life processes in the non-chordates.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
7.	I	SEM-II	CC 4 CC2-4-TH	Cell Biology Full Marks: 50 Credit: 4	**Unit 1:** Detailed study about plasma membrane structure, fluid mosaic model, different types of transporters and junctions.
					Unit 2: Description of the structure and functions of ER, Golgi apparatus, Lysosome and their involvement in protein sorting and mechanism of vesicular transport.
					Unit 3: Dealing with the structure of mitochondria and their functions on ETC, chemiosmotic hypothesis for ATP production. Brief idea on the structure of peroxisomes.
					Unit 4: Understanding the structure and function of cytoskeleton i.e microfilaments and microtubules which provides an important structural framework for cell shape.
					Unit 5: Studying the structure and function of nucleus with nuclear pore complex and nucleolus, how they store the genetic materials, how chromatin materials are packed as nucleosome.
					Unit 6: Detailed study on replication and reproduction of cells, any altered pathway leading to cancer, involvement of numerous genes in cell cycle regulations. Brief idea on the tumor suppressor gene and oncogenes.
					Unit 7: Studying and understanding various cell signaling mechanisms, detailed process of apoptosis.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
8.	I	SEM-II Full Marks: 30 Credit: 2	CC2-4-P	Cell Biology – Lab	Studying various stages of mitosis, meiosis, permanent slide preparation for visualizing Barr body of human female, visualizing DNA and studying cell viability.

Overall Outcome of the course CC2-4:	**CO1.** Clear in-depth idea on different cellular structures, organelles and their function. **CO2.** Demonstrate a thorough understanding of mechanism of cell cycle (also through practical by studying various stages from grasshopper testes). **CO3.** Developing student's ability to identify the invertebrates and classify them up to the class level on the basis of systematic position. **CO4.** Understand the basis of signal transduction and apoptotic process.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
9.	II	SEM-III	CC 5 CC3-5-TH	Chordata Full Marks: 50 Credit: 4	**Unit 1:** Basic knowledge on Phylum Chordata.
					Unit 2: Basic information on Protochordates along with its classification upto classes, Metamorphosis of Ascidia, Structure of Pharynx and Feeding mechanism of *Branchiostoma*.
					Unit 3: Classification of Cyclostomes upto orders, with general idea on it.
					Unit 4: General characters & Classification of Pisces upto living Sub Classes. Knowledge on Fish migration, Parental care & swim bladder.
					Unit 5: General characters & Classification of Amphibia upto living Orders. Knowledge on Amphibian metamorphosis, Paedomorphosis & Parental care.
					Unit 6: General characters & Classification of Reptiles upto living Orders. Knowledge on Poisonous & non-Poisonous snakes, differences, Poison apparatus & biting mechanism.
					Unit 7: General characters & Classification of Aves upto living Sub Classes. Knowledge on Fish migration, Parental care & swim bladder.
					Unit 8: General characters & Classification of Mammals upto living Sub Classes. Knowledge on Exoskeletal derivatives, Adaptive radiation with reference to locomotory appendages & Echolocation in Micro chiropterans.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
10.	II	SEM-III Full Marks: 30 Credit: 2	CC-3-5-P	Chordata Lab	Identification with Reasons of selected Protochordates, Chordates. Study of system (Brain & pituitary, digestive & Urinogenital) & its organization in *Tilapia* fish. Pecten study from Fowl head. Habitat or behavior study of animals.

Overall Outcome of the course CC3-5:	**CO1.** Imparts conceptual knowledge of Chordates, their adaptations, significance and associations in relation to their environment. **CO2.** Developing student's ability to identify the Chordates and classify them up to the Sub Class/Order level on the basis of systematic position. **CO3.** Understand the basis of life processes in the Chordates. **CO4.** Increase interest to engage in animal study & know its importance for us. **CO5.** Recognize the importance of conservation.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
11.	II	SEM-III	CC 6 CC3-6-TH	Animal Physiology: Controlling and Co-ordinating System Full Marks: 50 Credit: 4	**Unit 1:** To have a comprehensive knowledge on the types, structure, function and localization of the various tissues present in an animal body.
					Unit 2: To understand the structure and the types of bone and cartilage, with an elaborate idea on the process of ossification.
					Unit 3: To specifically understand the physiology of nervous system by studying the functioning, types and mode of communication between the structural units, neurons.
					Unit 4: To have a thorough perception of the different types of muscle, their structure and characteristic feature of muscle fibres, and the molecular and chemical basis of muscle contraction.
					Unit 5: To understand the histology of mammalian testis and ovary and broadly have knowledge of the physiology of mammalian reproduction, stressing on the menstrual and oestrous cycles.
					Unit 6: To understand the histology and functions of the various endocrine glands. To be able to classify hormones basing on their chemical nature and mechanism of action.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
12.	II	SEM-III Full Marks: 30 Credit: 2	CC3-6-P	Animal Physiology: Controlling & Coordinating Systems Lab	To have a hands-on training in preparing the temporary mounts and permanent slides of various tissues and in recording electrical stimulation from muscles. To be able to identify various tissues by studying the permanent slides.

Overall Outcome of the course CC3-6:	**CO1.** Imparts conceptual knowledge of several aspects of animal physiology like tissues, bones and cartilage, nervous system, reproductive system, endocrine and muscular system etc. **CO2.** Emphasizes the function and coordination of each of the systems. **CO3.** Practical training on Histology, permanent slide preparation technique. **CO4.** Detailed study of characters of different types of tissues.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
13.	II	SEM-III	CC 7 CC3-7-TH	Fundamentals of Biochemistry Full Marks: 50 Credit: 4	**Unit 1:** Understand the structural analysis & classification of carbohydrates along with biological importance. Get knowledge on important carbohydrate metabolic pathways essential for a life.
					Unit 2: Structure & function of Fatty acids & derivatives. Understand the lipid metabolism process & Fatty acid biosynthesis procedure essential for a life.
					Unit 3: Basic knowledge on amino acids & its structure, classification, electrochemical properties, along with physical importances. Various metabolic pathways of proteins.
					Unit 4: Able to understand the structure & metabolism of nucleic acids.
					Unit 5: Gather knowledge on Classification, nomenclature, properties & controlling factors of an enzyme activity.
					Unit 6: Learn about Oxidative Phosphorylation, highly efficient energy production method for metabolic processes.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
14.	II	SEM-III Full Marks: 30 Credit: 2	CC3-7-P	Fundamentals of Biochemistry Lab	Qualitative tests for carbohydrates, proteins and lipids, Qualitative estimation of Urea, uric acid & water-soluble protein by Lowry method, Paper chromatography of amino acids.

Overall Outcome of the course CC3-7:	**CO1.** Students will explain/describe the synthesis of proteins, lipids, nucleic acids, and carbohydrates and their role in metabolic pathways along with their regulation in physiological functioning of the organism. **CO2**. Understand biochemical mechanisms and kinetics. **CO3.** Interactions and interdependence of biochemical processes. **CO4.** Design a scientific process and employ the scientific method, demonstrating that biochemistry is evidence-based and grounded in the formal practices of observation, objective measurement, and hypothesis testing.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
15.	II	SEM-III	SEC(A) -3-2-TH	Sericulture Full Marks: 80 Credit: 2	**Unit 1:** Basic knowledge on Sericulture, types of Silk worms, Culture procedures, Mulberry &Non-Mulberry cultivation techniques.
					Unit 2: Biology of silk worms & Basic information on it including life cycle.
					Unit 3: Gives knowledge of silk worm rearing.
					Unit 4: Pests and Diseases associated with Silk worms Control & prevention of it.
					Unit 5: Entrepreneurship in Sericulture.

Overall Outcome of the course SEC(A) -3-2:	**CO1.** Learning on various methodologies and perspectives of Sericulture for the possibilities of self-employment. **CO2.** Gather knowledge on Life cycle, economic importance of Silk moths, its type, rearing method, cost, Host plants maintenance. **CO3.** Commercial value of Silk **CO4**. Problems & solutions related to sericulture.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
16.	II	SEM-IV	CC 8 CC4-8-TH	Comparative Anatomy of Vertebrates Full Marks: 50 Credit: 4	**Unit 1:** To thoroughly understand the structure, function and derivatives of the skin in various vertebrate classes.
					Unit 2: To be able to distinguish and elaborate the anatomy of the stomach in various vertebrate classes and to understand the dentition types in mammals.
					Unit 3: To be able to compare the respiratory organs in fishes, birds and mammals.
					Unit 4: To comprehend the basic plan of a chordate circulatory system with an elaborate idea on the evolution of heart and aortic arches in chordates.
					Unit 5: To understand the significance of the urinogenital system, in terms of the tripartite concept of development of kidneys and the evolution of the urino-genital ducts.
					Unit 6: to have an overview of the comparative account of the brain, cranial nerves, olfactory and auditory receptors in various vertebrate classes.
					Unit 7: To have a broad idea on the axial and appendicular skeleton, with special reference to the limbs, girdles in pigeon, and jaw suspension in mammals.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
17.	II	SEM-IV Full Marks: 30 Credit: 2	CC4-8-P	Comparative Anatomy of Vertebrates Lab	To identify the scales in fishes, the disarticulated skeleton of various vertebrate classes and the skull of a pigeon, herbivore and a carnivore mammal. Through model/picture be able to compare the heart and brain of various vertebrates.

Overall Outcome of the course CC4-8:	**CO1.** Clear idea about how physiological systems differ in different vertebrates. **CO2.** Knowledge about evolution of different physiological systems in different vertebrates. **CO3.** Practical knowledge about different organs using models and pictures. **CO4.** Practical study of different types of bones in vertebrates.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
18.	II	SEM-IV	CC 9 CC4-9-TH	Animal Physiology: Life Sustaining Systems Full Marks: 50 Credit: 4	**Unit 1:** To understand how the gastro-intestinal tract is organized and functions, and the specifics of the process as to how food is digested and Carbohydrates, Lipids and Proteins are absorbed in humans.
					Unit 2: To understand the mechanism of respiration with an extended knowledge on respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood their dissociation curves and the factors influencing it and respiratory pigments.
					Unit 3: To be able to explain the structure and functions of haemoglobin. To have a detailed understanding of the blood clotting system, process of Haematopoiesis and the blood groups.
					Unit 4: To elaborately understand the Coronary Circulation, structure and working of conducting myocardial fibres, origin and conduction of cardiac impulses and Cardiac Cycle and Cardiac output.
					Unit 5: To understand the process of thermoregulation by studying the mode of thermoregulation in camel and polar bear. To understand the physiology of osmoregulation in aquatic vertebrates.
					Unit 6: To have a detailed knowledge of the structure of Kidney and its functional unit. To understand the physiology of urine formation and regulation of acid-base balance.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
19.	II	SEM-IV	CC4-9-P	Animal Physiology: Life Sustaining Systems Lab	To be able to experimentally determine the ABO blood group, estimate content of haemoglobin using Sahl's Haemoglobin meter, identify the various blood cells in human and haemolymph of cockroach and view the measurement of blood pressure by a digital meter. To have a hands-on training in preparation of haemin crystals and haemochromogen crystals.

Overall Outcome of the course CC4-9:	**CO1.** Clear idea about how physiological systems function. **CO2.** Knowledge about thermoregulation and osmoregulation in land and aquatic vertebrates respectively. **CO3.** Practical knowledge about blood composition and group determination in humans and hemolymph in cockroach.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
20.	II	SEM-IV	CC10 CC4-10-TH	Immunology Full Marks: 50 Credit: 4	**Unit 1:** Basic knowledge of cells & organs of immune system.
					Unit 2: Understand types of immunity.
					Unit 3: Idea on Antigen, factors of immunogenicity, epitopes & their actions.
					Unit 4: Understand Antibody, its type & its role in host defense mechanism, outline key events and cellular players in Antigen antibody interaction.
					Unit 5: Develop knowledge on MHC, T cell receptor its structural & functional properties & its importance in immune system
					Unit 6: Idea on types, properties and functions of cytokines.
					Unit 7: Learn Complement system pathways & defense mechanism.
					Unit 8: Develop knowledge on different types of Hypersensitivity.
					Unit 9: Learn about Vaccine, its type & role to enhance immunity in a body.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
21.	II	SEM-IV Full Marks: 30 Credit: 2	CC4-10-P	Immunology Lab	Brief idea & histological study of lymphoid organs, Demonstration of ELISA.

Overall Outcome of the course CC4-10:	**CO1.** Basic knowledge of immunological processes at a cellular and molecular level including Host defense mechanism. **CO2.** Central immunological principles and concepts, relation & role of cells to maintain the immunity system in a body. **CO3.** Understand the principles governing vaccination and the mechanisms of protection against infectious diseases. **CO4.** Understand and explain the basis of allergy and allergic diseases. **CO5.** Learn Immunotherapy Techniques.

SL	Part	Semester	Course Code ZOOA	Course Name	Course Outcome
22.	II	SEM-IV	SEC B SEC(B) -4-1-TH	SEC-1 Aquarium Fish Keeping Full Marks: 80 Credit: 2	**Unit 1:** To have an overview of the potential scope of Aquarium Fish Industry as a Cottage Industry. To have a knowledge on the various Exotic and Endemic species of Aquarium Fishes.
					Unit 2: To be able to identify the common aquarium fishes basing on their common characters, sexual dimorphism and habitat.
					Unit 3: To have a thorough knowledge on the nutritional value, availability and culture and preparation of various fish feed.
					Unit 4: To gain knowledge on the methods of fish transportation with reference to the handling, packing and forwarding techniques.
					Unit 5: To be able to successfully set -up and maintain an aquarium fish farm in a cost-effective manner, as a cottage industry.

Overall Outcome of the course SEC (B) 4-1:	**CO1.** Descriptive knowledge about Aquarium fish keeping comprising aquarium industry, biology of aquarium fishes, their feeding habits, how they are maintained and transported including various examples (both exotic and endemic).

COURSE OUTCOME (Zoology General)

SL	Part	Semester	Course Code ZOOG	Course Name	Course Outcome
1.	I	SEM-I	CC1/GE1 CC1-1-TH CC1-1-P	Animal Diversity	Introduction to Animal kingdom, understanding the diversity, classification of the animal world, along with practical identification of various animals including learning their systematic positions.
2.	I	SEM-II	CC2/GE2 CC2-2-TH CC2-2-P	Comparative Anatomy & Developmental Biology	This course offers a comparative account of various physiological systems found in different vertebrates. In addition, a portion embryology is also dealt with great details. Further, course offers practical learning about bones, larval stages and embryonic developmental stages.
3.	II	SEM-III	CC3/GE3 CC3-3-TH CC3-3-P	Physiology and Biochemistry	Theory Course is a combination of two areas namely physiology and biochemistry while practical deals primarily with histology and also few biochemical analyses.
4.	II	SEM-IV	CC4/GE4 CC4-4-TH CC4-4-P	Genetics & Evolutionary Biology	Basics of Mendelian Genetics and experimental verification of the Mendelian ratio using Chi square test. Knowledge about human aneuploidy using photograph of karyotype. Evolutionary principles and study of phylogeny of horse from diagram of skull and limb, Identifying Darwinian finches from photographs.

COURSE OUTCOME (Zoology Honours and General --1+1+1 System)

Course Name	Paper	Course Outcome
Bsc. Zoology Honours (Part III)	Paper 5 Unit I Unit II	**CO1.** Consists of two units that covers broad topics from Molecular Biology, Parasitology and Microbiology and Immunology. Students get a detailed idea on Genome and Proteome analysis using advanced methods in molecular biology that is currently in use in various laboratories. Students in this section also learn about Gene regulation at genetic and epigenetic level, DNA repair mechanisms and genetic disorders. **CO2.** Students are introduced to microbial world surrounding us, their relation to common diseases in man, how they are cultured in labs including concept of vector and life cycles of some important parasites. **CO3.** Outline of immunological processes at a cellular and molecular level including Host defense mechanism. Understanding the principles governing vaccination and the mechanisms of protection against infectious diseases that is very relevant in the current context.
	Paper 6 Unit I Unit II	From this section students mostly acquire knowledge on different neuro endocrine integration evident in animal body along with applied zoology. This idea may help them to get employment opportunity in future.
	Paper 7 Practical	Practical experience on few techniques on Molecular Biology, Immunology, Histology Parasitology and physical visit to museum to study different adaptations found in animals.
	Paper 8 Practical	Apart from studying principles of instrumentations students prepare two environmental audit reports of a particular area. They also visit a suitable ecosystem and prepare a field report. In this process they get an idea about various diversity indices, how they are calculated, presented with proper explanation and interpretation.
Bsc. Zoology General (Part III)	Paper IV Group A Group B Group C Group D	This course covers three theoretical sections that covers Applied Zoology, Evolutionary Biology, Parasitology and Immunology. Outline knowledge on applied zoology will help students to make successful career choices or engage in entrepreneurship in future. Further they also come to know about few parasites and their impact on human health. Brief knowledge on evolution and adaptation is also achieved. Practical training ensures some experimental evaluations including one field training on species diversity of a local area.