Department of English,
Biswanath College
Chariali

Programme Outcome of BA English Honours Course:

The BA English Honours programme designed by the affiliating university, Gauhati University, under choice-based semester system has been taught in this college since the academic session 2019. The English Honours syllabus includes History of English literature as well as various literary texts that were written between Chaucerian period and postmodern period of English literature in addition to new literatures written in the former European colonies, linguistics and classical literature produced in ancient India, Greece and Rome. The stated objectives of the programmes have been summed up below:

1.The programme aims at training students who upon graduation will be acquainted with literature produced in England and America, ancient India, Greece and Rome apart from literatures produced in the former European colonies thereby introducing them to various cultures of the world. It is expected that at the end of the course the students will acquire more human values and will be more knowledgeable.

2. As the programme offers courses that include diverse literary forms, students will develop not only their imaginative power and sensibility but also their analytical power. Students become sensitive to the issues around them and at the same time they will be able to offer their own judgement on a particular literary text.

3. The programme will enhance students' critical approaches by making them exposed to literary criticism and various critical theories.

4. The graduates with English Major Course will be able proceed to further study in English literature apart from allied subjects.

5. The programme will enable the learners to develop a good understanding of English literature as well as language.

6. The programme aims at gender sensitization by focussing on courses on women's writings.

7. The programme aims at enhancing students' perception of nature and ecosystem by including courses on nature writing.

8. The programme also aims at increasing students' interest in creative writing.

Programme Outcome of BA Regular English Course:

1. The course introduces students to select pieces of English prose, poetry and drama in addition to selections of prose and poetry from other countries of the world which

were former colonies of European imperial powers. Thus, the programme enhances students' knowledge of English literature or literatures written in English.

2. The programme aims at enhancing learners' skill of the English language. It is expected that a student with CC English will be able to communicate well both in oral and written form.
3. The programme enables learners to get introduced to various cultures of the world that will help students inculcate good ethical values.

1. Course outcome of BA English Honours Course (CBCS System)

The BA English Hons Course introduces students to a great variety of literary texts either written in English or translated into English from other languages and thereby introduces learners to culture, tradition and values of various nations of the world. The course has 14 compulsory papers in addition to 12 Discipline Specific papers out of which students are required to offer four courses.

Paper 1: ENG-HC-1016 Indian Classical Literature

Paper 1,entitled Indian Classical Literature with the help of Kalidasa's *Abhijnana Shakuntalam,* Vyasa's *The Mahabharata,* Sudraka's *Mrcchakatika* and Ilango Adigal's *'The Book of Banci'* introduces students to a selection of literatures of India in English translation. Given that Indian Classical Literature offers a rich and diverse canvas that spans across genres like drama, poetry, the epic narrative as well as short fictional fables, to name a few, it is essential that students studying English literature are familiar with at least a few of these. This paper encourages students to think laterally about literatures of the world, and the possibility of cultural exchange.

Paper 2: ENG-HC-1026 European Classical Literature

Paper 2 entitled European Classical Literature Classical writings in Europe introduces students to various European classical texts of poetry, theatre, and general discourses. Students are introduced to Homer's The Odyssey, Sophocles's Oedipus, the King, Plautus's *Pot of Gold.* While the Aristotelian focus on the examination of the essentials of poetry extended to incorporate discussions on epic and drama, subsequent writers such as Horace drew attention to the purposefulness of the creative exercise. In the theatre the widely divergent compositions by Sophocles and Plautus respectively show the consolidation of a rich cultural discourse. It is this enriching literary tradition that this paper seeks to familiarize with through the study of representative texts belonging to the Classical. It is expected that at

the end of the programme a student will have a good understanding of classical Greek and Roman literature.

Paper 3: ENG-HC-2016 Indian Writing in English

This paper introduces students to a selection of literatures of India in English translation. Given that Indian Classical Literature offers a rich and diverse canvas thatspans across genres like drama, poetry, the epic narrative as well as short fictional fables, to name a few, it is essential that students studying English literature are familiar with at least a few of these. This paper encourages students to think laterally about literatures of the world, and the possibility of cultural exchange.

Paper 4: ENG-HC-2026 British Poetry and Drama: 14th to 17th Centuries

This paper aims to familiarize the students with the two major forms in British literature from the 14th to the 17th centuries – poetry and drama, apart from acquainting them with the contexts that generated such literatures. The larger contexts of the Renaissance, the nature of the Elizabethan Age and its predilections for certain kinds of literary activities, and the implications of the emergence of new trends will be focused in this paper. It will also highlight the seminal issues and preoccupations of the writers and their ages as reflected in these texts.

Paper 5: ENG-HE-5016 History of English Literature and Forms

This paper introduces students to the History of English Literature and the major literary forms. It adopts a chronological approach to the study of poetry, drama, fiction and non-fictional prose, showing the development of each form as it moves through the various periods of English literature and its expansion into global English writing. While authors have been named in some instances as representative of forms and periods, in other cases, especially in the 20th and 21st centuries, the expansion of the field has meant that individual authors are too numerous to name.

Paper 6: ENG-HC-3016 American Literature

This paper seeks to acquaint the students with the main currents of American literature in its social and cultural contexts. The texts incorporated in the paper are a historical reflection of the growth of American society and of the way the literary imagination has grappled with such growth and change. A study of the paper, hence, should lead to an acquaintance with the American society in its evolutionary stages from the beginnings of modernism to the present

as well as with exciting generic innovations and developments that have tried to keep pace with social changes.

Paper 7: ENG-HC-3036 British Poetry and Drama: 17th and 18th Centuries

This paper aims to familiarize the students with British literature in the 17th and 18^{tth} centuries, a time-period which sees the emergence and establishment of greatly diverse kinds of writings. The selected texts may encourage the students to look at the economic, political and social changes in (primarily) Britain during this period, such as the shifts from the Puritan Age to the Restoration and Neoclassical periods. The paper also seeks to familiarize the students with the larger contexts that generated such literatures as well as the possible impacts of the literature on society. The significance of the scientific revolution during this period may also be studied in relation to the literary productions.

Paper 8: ENG-HC-4016 British Literature: The 18th Century

This paper aims to familiarize the students with British literature in the 18th century. Avery interesting age in which reason and rationality dominated, this age saw the publication of some of the best novels and works of non-fictional prose and poetry in the English language. Though it was not predominantly an age of drama yet one cannot but pay attention to the few plays of the century. Although the texts in the course are mostly by men it must be noted that quite a number of women writers were also part of the literary scene. The texts in the course are representative of the age and to some extent representative of the forms as well. The selected texts hope to give the students an overview of the age and the writings that the age produced.

Paper 9: ENG-HC-4026 British Romantic Literature

The nineteenth century begins with the triumph of the Romantic imagination, expressing itself most memorably in the poetry of Blake, Burns, Wordsworth, Coleridge, Shelley, and Keats. The poetry of the age fashions itself partly in revolt to the spirit of the previous age, with very different ideas about the relationship between humans and nature and the role of the poet taking hold. This paper includes selections from works of major Romantic poets which address these issues, enabling students to appreciate the essence of the Romantic vision. In addition they will read that remarkable oddity, Frankenstein, a novel that also illuminates Romanticism from another angle.

Paper 10: ENG-HC-4036 British Literature: The 19th Century

The middle and later parts of the 19th century sees the novel coming into its own, although Jane Austen has already established the prestige of the novel form through her incisive explorations of the complexity of human motive and conduct, especially in their worldly affairs. The texts chosen will expose the students to the ground-breaking efforts of the poets as well to the works of fiction writers who manage to consolidate and refine upon the achievements of the novelists of the previous era. Austen to Rossetti represents a remarkable literary development and range of works, addressing a very diverse array of social preoccupations.

Paper 11: ENG-HC-5016 British Literature: The 20th Century

While literary modernity can trace its roots to the works of some European writers of the 19th century, in England it is in the 20th century that the era of Modernism finds its voice in arts and literature. The works of the writers chosen for this paper are good introductions to the spirit of modernism, with its urgent desire to break with the codes and conventions of the past, experiment with new forms and idioms, and its cosmopolitan willingness to open itself up to influences coming from other shores. The paper goes beyond the High Modern period of the early century and the students will also get acquainted with the ethos of postmodernism through a reading of recent poetic and fictional works.

Paper 12: ENG-HC-5026 Women's Writing

This paper seeks to direct the students' attention to nineteenth and twentieth century writings by women living in different geographical and socio cultural settings. Students will get acquainted with the situationally distinct experiences of women articulated in a variety of genres-poetry, novels, short stories, and autobiography, while the selections from Mary Wollstonecraft-the only 18th century text prescribed, will acquaint students with the ideas contained in one of the earliest feminist treatises of the western world. Apart from an examination of the themes and styles in the prescribed texts, students will be required to engage themselves with the specificities of the contexts from which the texts emerged and also analyze the women writers' handling of the different genres to articulate their women-centric experiences.

Themes: Gender, sexual/textual politics, feminism, body, identity, class, location, voice, space, gender and narrative.

Paper 13: ENG-HC-6016 Modern European Drama

The paper aims at introducing students to the innovative dramatic works of playwrights from different locations in Europe, which taken together represents the wide range of modern drama and its fortunes on the written page and the stage. The selected plays would allow an understanding of the emergence of avantgarde movements and trends and dramatic devices and techniques during the period of modernism which eventually influenced theatrical practices in other nations of the world.

Paper 14: ENG-HC-6026 Postcolonial Literatures

European Colonialism since the fifteenth century changed the face of the world in many significant ways, and the effects of the experience of colonialism remain in many countries around the world even in the postcolonial era. This paper gives the students an opportunity to acquaint themselves with some of the novels, short stories and poems from postcolonial literatures across the world, with the texts showcasing the many regional, cultural differences and peculiarities, as well as common and shared experiences of the postcolonial condition.

Course outcome of Discipline Specific Course for English Hons students

Paper 2: ENG-HE-5026Modern Indian Writing in English Translation

Literature in the various Indian languages presents a huge body of work testifying to the diverse cultural and regional preoccupations in the respective regions these languages belong to. This paper attempts to give students an introductory glimpse into this richness and diversity of Indian literature written in the regional languages.

Paper 3: ENG-HE-5036 Literature of the Indian Diaspora

In the light of global literature today focusing extensively on ideas of transnationalism, exile, migration, displacement, and so on, literature of the diaspora has come to exert a strong presence in the global scene. This paper will look at the diasporic experience with particular reference to Indian diasporic writers.

Paper 4: ENG-HE-5046 Nineteenth Century European Realism

The insistence on literary representation whose objective was to 'mirror' reality gained ground in nineteenth-century Europe across the different cultural spaces of the Continent. That is why varieties of realism surfaced in the literary traditions which were as culturally divergent as Russia and Spain. This paper is designed to provide an interesting sampling of the traditions that contributed to the growth and consolidation of European Realism in the nineteenth century. Study of these texts will also facilitate the understanding of the gradual

movement towards modernism in the twentieth century which was, in many ways, both a response and a reaction to the major tendencies of European Realism.

Paper 5: ENG-HE-5056 Literary Criticism and Literary Theory

This paper will familiarize students with some important texts on literary criticism and literary theory. Beginning from William Wordsworth's Preface to the Lyrical Ballads the purpose will be to inform the students on the shifts in literary interpretations and critical approaches so as to equip them while reading texts across genres.

Paper 6: ENG-HE-5066 Science Fiction and Detective Literature

Science Fiction and Detective Literature have a fairly venerable ancestry, going back at least two centuries. Some fine literary minds have engaged with these genres, and their creations can be fruitfully studied to explore ways in which new narrative possibilities have emerged due to the human fascination for crime, mystery and improbable occurrences.

Paper 7: ENG-HE-6016 Literature and Cinema

Many literary texts have been adapted to film edition. This paper will introduce how many literary texts have been transformed into cinematic mode.

Paper 8: ENG-HE-6026 World Literatures

This paper will introduce students with literature produced in English the former European colonies.

Paper 9: ENG-HE-6036 Partition Literature

This paper introduces students with literature produced from consequences of partition of India into India and Pakistan,

Paper 10: ENG-HE-6046 Travel Writing

This paper will introduce students to a great variety of travel writing ranging from Indian travelogues to British and American travelogues.

Paper 11: ENG-HE-6056 Life Writing

This paper will introduce students to several great personalities of the world through their autobiographies and autobiographies.

Paper 12: ENG-HE-6066 Writings from North East India

This paper will introduce the students with literature both oral and written that are produced in North East India.

2. Ability Enhancement Compulsory Course:

ENG-AE-1014: English Communication:

This course is intended to enable the students to acquire all the four skills of the English language so that they can effectively use the language. It is expected that at the end of the course the students will be able to write and speak good English.

3. Skill Enhancement Course:

Paper 1: ENG-SE-3014 CREATIVE WRITING

The students in this course will focus on three creative genres, fiction, non-fiction and poetry. The emphasis will be to build proficiency in readings and writings. The course encourages active class participation and lots of writings. One of the basic objectives of the course is to allow students to explore ideas, feelings, experiences and effectively communicate these stimulus using the written word. Each lecture will be tied to readingof texts, techniques, narratology and rhetorical positions.

Paper 2: ENG-SE-4014 Translation: Principles and Practice

This course is designed to give students basic skills in translation. It introduces students to the field of translation studies and gives them training in practical translation.

4. REGULAR ENGLISH (BA Sem I & II)

ENG-CC-1016 English I & ENG-CC-2016 English II:

The aim of this course (English I and II) is to provide the students an opportunity to read and respond to representations of issues in contemporary life and culture in the English language. The selection of texts is aimed to present themes and topics that are stimulating, insightful and informative

5. Alternative English

Alternative English I (ALT-CC-3016)

This paper would seek to acquaint students with the major genres of English literature through texts which are landmarks of each genre. The texts have been carefully chosen to effectively represent the distinctive qualities of a particular genre. Moreover, students are encouraged to read the prescribed texts in their social and cultural contexts.

Alternative English I (ALT-CC-4016)

The course has been designed to familiarise students with different forms of literature, texts and their contexts. The select texts would enable them to understand literary representations and a writer's engagement with the social, cultural and political milieu.

(Dr. Naresh Thakur)
Head & Associate Professor
Dept. of English, Biswanath College

DEPARTMENT OF BOTANY

BISWANATH COLLEGE

PROGRAMME OUTCOMES

Link to the Gauhati University syllabus:

1. Botany Honours course (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/botany-h
2. Botany Regular course (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/botany
3. Botany Major (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-botany-major
4. Botany General (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-botany-general

PROGRAMME: B.SC. BOTANY

a. Knowledge and Understanding:

a. Diversity of plants and microbes in terms of structure, function, reproduction and ecological roles.
b. Evaluation and assessment of plant diversity.
c. Plant systematics and classification.
d. Value of biodiversity in terms of ecological balance and sustainable development.
e. Application of Statistics in biological data analysis.
f. Application of *in-silico* techniques in biological science.
g. Basics of biotechnology, biochemistry, genetics and modern biological tools and techniques.

2. Intellectual Skills:

a. Logical interpretation of problems related to biological science.
b. Searching various burning issues related to biology, environment and sustainable development though internet.
c. Capacity building for individual survey works related to nature and environment.

3. .Practical Skills:

a. Study of plant and microbial diversity.
b. Plant classification and identification, anatomy, morphology, plant physiology, plant biochemistry, genetics, plant breeding etc.
c. Ecological study of the local area.

d. *In-silco* techniques in biological science.

e. Preliminary skills on biotechnology, horticulture, biofertilizers, nursery techniques etc.

4. **Transferable Skills:**

a. Use of information technology for accumulation and sharing of data.

b. Dissemination of scientific ideas in writing and orally.

c. Creation of team spirit.

d. Access of E- library resources.

e. Regularity, punctuality, devotion and career planning.

5. Scientific Knowledge and problem analysis:

Application of principles of basic science in studying and analysing problems and phenomena related to biological science.

6. **Usage of Modern tools:**

a. Practical application of modern techniques/ instruments in Biochemical and molecular analysis, , Biotechnology, *in vitro* culture, microbiology etc.

7. **Ethics**:

1. Application of moral and ethical principles to mitigate environmental issues and biodiversity conservation.
2. Basic knowledge on environment and sustainable development will create responsible citizens.

Dr. Ratul Nath
Head
Deptt. of Botany

DEPARTMENT OF BOTANY

BISWANATH COLLEGE

Course Specific Outcomes (CBCS)

B.Sc. Botany Honours

Biswanath College is an affiliated college of Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. Gauhati University course curriculum for Botany Honours under CBCS has mentioned some course outcomes while designing the curriculum. However, the college expects more outcomes from the course. Course specific outcomes of Botany Honours, CBCS is summarized below.

1. **Sem I:**

   BOT-HC-1016: Phycology and Microbiology

- Basic knowledge on viruses and bacteria, and their importance in agriculture and medicine.
- Basic knowledge on Algal classification, Economic and ecological importance of Algae.
- Practical knowledge on structure and life cycle of Bacteriophage microscopy of bacteria and algae

BOT-HC-1026: Biomolecules and Cell Biology

- Basicknowledge on structure, classification and physicochemical properties of bio-molecules and enzymes.
- Basic knowledge on structure, properties and functions of cell and its components
- Practical knowledge on properties of cell, microscopy of plant cell and qualitative tests of bio-molecules

2. **Sem II**

   BOT-HC-2016: Mycology and Phytopathology

- Basic knowledge on different classes of fungi, their structure, classification, life cycle and reproduction
- Basic knowledge on diseases in plants caused by viruses, bacteria and fungi and biotechnological applications of fungi
- Structural analysis of different classes of fungi and their reproductive stages and symbiosis by fungi.

BOT-HC-2026: Archegoniate

- Basic knowledge on morphology, anatomy, classification and properties of bryophytes, pteridophytes and gymnosperms.
- Basic knowledge on reproduction and economic importance and ecological significance of bryophytes, pteridophytes and gymnosperms.
- Practical knowledge on morphology and reproductive structures of bryophytes, pteridophytes and gymnosperms.

3. **Sem III**

BOT-HC-3016: Morphology and Anatomy of Angiosperms

- Basic knowledge on morphology of angiosperms, anatomical organization of tissues and developmental biology of plant body
- Practical knowledge on inflorescences, fruits of angiosperms and anatomical features of plant body.

BOT-HC-3026: Economic Botany

- Basic knowledge on morphology of economically important plants such as cereals, legumes, spices, Fibres, Timber plants, Drug-yielding plants etc.
- Practical Knowledge on micro-chemical tests of economical plants.

BOT-HC-3036: Genetics

- Knowledge on Mendelian concepts in genetics; structure, functions and properties of chromosome; chromosomal aberration
- Knowledge on gene structures and gene mutations, population genetics
- Practical knowledge on chromosomal mapping and gene interaction studies
- Practical visualization of chromosomal anomalies

4. **Sem IV**

BOT-HC-4016: Molecular Biology

- Detailed knowledge on architecture of nucleic acids, organization of DNA in organisms, models of replication and the factors associated with it
- Detailed knowledge on transcriptional and post transcriptional events in a cell, translation of proteins
- Practical acquaintance of isolation and quantification of DNA from plants.

- Knowledge on photographic study of RNA polymerases and RNA modification machinery

BOT-HC-4026: Plant Ecology and Phytogeography

- Knowledge on origin, formation and properties of abiotic components of the ecosystem, interactions and adaptation of plants with biotic and abiotic factors
- Knowledge on properties of communities in a population and trophical and habitat organization in an ecosystem
- Practical knowledge on property analysis of abiotic components of the ecosystem
- Practical knowledge on vegetation study and different ecological sites

BOT-HC-4036: Plant Systematics

- Knowledge on plant identification and classification systems, plant nomenclature
- Knowledge on phylogenetic and evolutionary relationships of angiosperms
- Practical knowledge on foliar morphology and taxonomical study of angiosperms

Skill Enhancement Paper

BOT-SE-3014: Biofertilizers

- Basic knowledge on the microbes used as biofertilizer and understand the process of their isolation, identification, mass multiplication, carrier based inoculants and knowledge on Actinorrhizal symbiosis
- Concept on the general characteristics, isolation, mass multiplication carrier based inoculants of Azospirillum and Azotobacter also the knowledge on the crop response to Azotobacter
- Basic knowledge on Cyanobacteria including factors affecting growth of Cyanobacteria, concept on the nitrogen fixation and use of blue green algae in rice cultivation
- Brief knowledge on the Mycorrhizal association and understand the details of various types, taxonomy, occurrence, distribution and growth parameters of Mycorrhiza
- Details about the organic farming, maintenance and recycling of biodegradable waste material and understand the methods of making biocompost and vermicompost with application

B.Sc Botany (Generic Elective Courses)

1) **Sem I**

BOT-HG-1016: Biodiversity (Microbes, Algae, Fungi and Archegoniate)

- Knowledge on structure and reproduction of viruses and bacteria, and their economic importance
- Describe general characteristics, morphological diversity, thallus organization, life cycles, ecological and economic importance of algae
- Describe general characteristics, morphological diversity, thallus organization, life cycles, ecological and economic importance of fungi
- General characteristics, classification, morphological diversity and evolutionary significance of bryophytes
- General characteristics and classification of pteridophytes; evolution of stele, heterospory and seed habit in pteridophytes
- . Classify gymnosperms, and describe their general characteristics and economic importance.
- Practical knowledge on staining and slide preparation to study bacteria, algae and fungi under the microscope.
- Practical knowledge on vegetative and reproductive structures of some representative bryophytes, pteridophytes and gymnosperms

2) **Sem II**

BOT-HG-2016: Plant Ecology and Taxonomy

- Understanding soil, water, light and temperature as ecological factors Knowledge on adaptive characters of hydrophytes and xerophyte
- Knowledge on plant community types and their succession
- Knowledge on ecosystem, trophic levels and energy flow in ecosystems
- Knowledge on biogeochemical cycling with an emphasis on carbon, nitrogen and phosphorus cycles CO6. General idea on phytogeography and endemism
- Knowledge on plant taxonomy, principles, ICN rules, ranks and hierarchy
- Knowledge on different systems of plant classification and cluster analysis
- Practical knowledge on soil temperature measurement, humidity measurement, rainfall estimation and light intensity measurement
- Adaptive morphological characterization of hydrophytes and xerophytes
- Quadrate size determination for herbaceous plant studies in ecology

- Estimation of frequency distribution of herbaceous plants using quadrate method
- Practical knowledge on plant identification upto the family level that belongs to Brassicaceae, Solanaceae and Lamiaceae; Preparation of herbarium specimens

3) Sem III

BOT-HG-3016: Plant Physiology and Metabolism

- Understanding the roles of water in plant physiology, transpiration, and guttation
- Knowing of macro- and micro-nutrients and mineral uptakes in plants
- Understanding the transportations of minerals and foods in plants
- Knowledge on photosynthetic pigments, photosynthetic reactions and photorespiration
- Understanding of respiration processes – glycolysis, TCA and PPP pathways
- Knowledge on enzyme properties, actions and inhibitions
- Knowledge on biological nitrogen fixation
- Knowledge on plant hormones, and plant responses to light and temperature
- Determine osmotic potentials of plant cells and effect of light on transpiration
- Calculate stomatal index and frequency
- Demonstrate the effect of pH and concentrations in catalase activity
- Demonstrate the effect of bicarbonate concentration on O2 evolution in photosynthesis

Skill Enhancement Paper

BOT-SE-3014: Biofertilizers

- Basic knowledge on the microbes used as biofertilizer and understand the process of their isolation, identification, mass multiplication, carrier based inoculants and knowledge on Actinorrhizal symbiosis
- Concept on the general characteristics, isolation, mass multiplication carrier based inoculants of Azospirillum and Azotobacter also the knowledge on the crop response to Azotobacter
- Basic knowledge on Cyanobacteria including factors affecting growth of Cyanobacteria, concept on the nitrogen fixation and use of blue green algae in rice cultivation
- Brief knowledge on the Mycorrhizal association and understand the details of various types, taxonomy, occurrence, distribution and growth parameters of Mycorrhiza
- Details about the organic farming, maintenance and recycling of biodegradable waste material and understand the methods of making biocompost and vermicompost with application

4) **Sem IV**

BOT-HG-4016: Plant Anatomy and Embryology

- Knowledge on different types of tissues and their organizations in plants
- Knowledge on secondary growth and anomalous structures in plants
- Knowledge on adaptive and protective characters of plants
- Understanding the reproductive units of a flower; ovule types, ovary types, pollination and fertilization mechanisms; embryo and endosperm developments and functions
- Hands on experiences on slide preparation for anatomical studies of leaf, stem and root
- Flower dissection and study of flower reproductive parts and events

BOT-HG-4026: Economic Botany and Plant Biotechnology

- Understanding the concept of 'centre of origin of crop plants' and their distribution with a special emphasis on wheat
- Overall knowledge on economically important crops with their botanical characters and parts used
- Knowledge on plant tissue culture and the basic molecular techniques used in biotechnology
- Basic concept of bioinformatics and its application.

Course Specific Outcomes (NON-CBCS)

B.Sc Botany (Major)

1) Sem V

Paper: M 501 (Theory): Microbiology and Immunology

- Basic knowledge on microbiology history and development.
- Knowledge on microbial nutrition, growth and metabolism.
- Knowledge on virus nature and transmission.

Paper: M 502 (Theory): Plant Pathology and Lichen

- Basic Knowledge on common plant diseases, plant pathogens, disease etiology, Host parasite interaction etc.
- Basic knowledge on plant disease management through chemical, biological and biotechnological methods.
- Basic knowledge on Lichens.

Paper: M 503 (Cytogenetics, Plant breeding and Biometrics)

- Basic knowledge on Mendelian concepts in genetics; structure, functions and properties of chromosome; chromosomal aberration
- Basic knowledge on gene structures and gene mutations, population genetics
- Basic knowledge on chromosomal mapping and gene interaction studies
- Basic knowledge on plant breeding and biometrics

Paper: M 504 (**Applied Botany**)

- Basic knowledge on application of microorganism in industry, medicine, agriculture and bioremediation.
- Basic Knowledge on crop improvement for disease resistance.
- Application of plant growth regulators in Agriculture.

Paper: M505 (Microbiology, plant pathology and Lichen)

- Practical knowledge on basic microbial techniques, identification of plant pathogen and plant disease and basic structure of Lichen

Paper: M 506 (Cytogenetics, plant breeding, Biometrics and applied botany)

- Practical Knowledge basics on plant genetic techniques, emasculation and common plant breeding techniques.
- Practical knowledge on basics of Bio-statistical techniques and study of microbes used in industry.

2) **Sem VI**

Paper: M 601 (Molecular Biology and Plant Biochemistry)

- Basic knowledge on gene regulation and expression, mutation, DNA replication etc.
- Basic knowledge on genetic codes and its properties.
- Basic knowledge on Biomolecules structure and function.

Paper: M 602 (Bioinformatics, Computer application and Biotechnology)

- Basic knowledge on Bioinformatics, biological database, DNA data bank, application of Bioinformatics.
- Basic knowledge on computer application and operating system.
- Basic knowledge in plant Biotechnology, plant tissue culture techniques, genetic engineering techniques and application.

Paper: M 603 (Plant Physiology)

- Basic knowledge on plant –soil-water relationship, classification of soil, transpiration etc
- Basic knowledge on Photosynthesis and its mechanism
- Basic knowledge on translocations of organic solutes in plants
- Basic knowledge on plant growth regulators and inhibitors, stress physiology.

Paper: M 604 (Plant Resource Utilization)

- Basic knowledge on plant introduction, classification of plant resources and uses.
- Basic knowledge on fibres yielding plants, timber and non-timber resources.
- Knowledge on medicinal plants, its botany and uses
- Basic knowledge on Ethnobotany, IPR, traditional knowledge etc.

Paper: M 605 (Molecular Biology, Biotechnology, Bioinformatics and computer application)

- Practical basic knowledge on techniques of molecular Biology and Biotechnology.
- Practical basic knowledge on Bioinformatics such as sequence alignment, sequence homology and construction of phylogenetic trees.

Paper: M 606 (Plant Physiology and Plant Resource Utilization)

- Basic practical knowledge on techniques of plant physiology, micro chemical and histochemical test analysis of important medicinal plants.

B.Sc Botany (General)

1) Sem V

Paper: E 501 (Theory): Structure, Development and reproduction in flowering plants

- Knowledge on parts of flowering plants, types of tissues, Anatomy of primary and secondary roots, stem and leaf of both monocot and dicot.
- Knowledge on the embryology of flowering plants

Paper: E 502 (Practical): Structure, Development and reproduction in flowering plants

- Practical knowledge on secondary growth, study on epidermal hairs, different types of fruits
- Demonstration of the method and process of budding, Air layering etc.

2) Sem VI

Paper: E 601 (Theory): Ecology and Utilization of Plants

- Knowledge regarding basic concept of ecology, types of ecosystem, components of ecosystem
- Understand the significance morphological significance of adaptation of plant in various environment.
- Basic knowledge pollution and their types.
- Knowledge regarding utilization of important crop plants like sugarcane, gram, Pea, Timber and medicinal plants etc with their uses and botanical sources.

Paper: E601 (Practical): Ecology and Utilization of Plants

- Practical knowledge on the anatomical features of some common hydrophytes and xerophytes etc.
- Practical knowledge on the morphology, part used, chemical nature etc. of some important crop plants.

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Head
Deptt. of Botany

DEPARTMENT OF CHEMISTRY

Biswanath College

Programme Outcomes: B.Sc. in Chemistry

Link to the GU Syllabus:

1. **Chemistru Honours (CBCS):** https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/chemistry
2. **Chemistry regular (CBCS):** https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/chemistry
3. **ChemistryMajor&General(Non-CBCS):** https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-chemistry-major

After successful completion of three year degree program in Chemistry a student should be able to;

1. Demonstrate, solve and understand the major concepts in all disciplines of chemistry.
2. Solve the problem and also think methodically, independently and draw a logical conclusion.
3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyse the results of chemical reactions.
4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
5. Find out the green route for chemical reaction for sustainable development.
6. To inculcate the scientific temperament in the students and outside the scientific community.
7. Use modern techniques, decent equipments and chemistry softwares.

Course Outcomes: B. Sc. Chemistry (Honours Course/Major)

Semester I	
Course	**Outcomes**
CHE-HC-1014: Inorganic Chemistry-I	On successful completion, students would have ➢ Clear understanding of the concepts related to atomic and molecular structure, Wave mechanics, Wave functions, quantum numbers, shapes of orbitals. ➢ Periodic properties, Effective nuclear charge, Slater's rule. ➢ Chemical bonding including ionic bond, covalent bond, metallic bond, weak chemical forces and redox behaviour of chemical species.
CHE-HC-1012: LAB	Students will also have hands on experience of standard solution preparation in different concentration units and learn volumetric estimation through acid-base and redox reactions.
CHE-HC-1024:	In gaseous state unit the students will learn

Physical Chemistry I	➢ The kinetic theory of gases, ideal gas and real gases. In this chapter they will learn the most important physical chemistry equation "the equation of state". They will learn to construct a model of the departures of real gases from perfect gases and learn to construct, interpret and use of Van der Waals equation of state. ➢ In liquid state unit, the students are expected to learn the qualitative treatment of the structure of liquid along with the physical properties of liquid, viz. vapour pressure, surface tension and viscosity. ➢ In the molecular and crystal symmetry unit they will be introduced to the elementary idea of symmetry which will be useful to understand solid state chemistry and group theory in some higher courses. In solid state unit the students will learn the basic solid state chemistry application of x-ray crystallography for the determination of some very simple crystal structures. ➢ The students will also learn another important topic ionic equilibrium. In this chapter they will learn about ionic equilibria involving dissociation of weak acids and weak bases in aqueous solutions, dissociation of sparingly soluble salts in aqueous solutions, dissociation of water, p^H- scale and also about the importance of buffer solution.
CHE-HC-1022: LAB	On successful completion of this course, students will be able to measure the surface tension and viscosity of a given solution using certain method specified in the course and to study the variation of the both property of the solution with concentration of the solute. They will also learn the indexing of a given power diffraction pattern of a cubic crystalline system, about buffer solution, preparation of buffer solution, pH metric and to measure the dissociation constant of a weak acid.
Semester II	
CHE-HC-2014: Organic Chemistry I	On successful completion of this course, students will be able ➢ To identify different classes of organic compounds and learn their nomenclature. ➢ To identify different types of reagents and reaction intermediates. ➢ To understand the shape of the molecules using hybridisation concept ➢ Toexplain/analyze their reactivity, mechanism based on different electronic displacement factors. ➢ To explain/analyze their stereo chemical aspects.

CHE-HC-2012: LAB	In this course, students will have hands on experience on checking the calibration of the thermometer, purification of organic compounds by crystallisation, checking of the purity of organic compound by measuring melting point, determination of boiling point of liquid compounds, chromatographic separation of organic mixtures.
CHE-HC-2024: Physical Chemistry II	➢ In this course the students are expected to learn laws of thermodynamics, thermochemistry, thermodynamic functions, relations between thermodynamic properties, Gibbs Helmholtz equation, Maxwell relations etc. ➢ Moreover the students are expected to learn partial molar quantities, chemical equilibrium, solutions and colligative properties. ➢ After completion of this course, the students will be able to understand the chemical systems from thermodynamic point of view.
CHE-HC-2022: LAB	On successful completion of this course students will have hand on experience on determination of heat capacity of a calorimeter, enthalpy of neutralization, enthalpy of ionization, integral enthalpy, enthalpy of hydration, basicity/protocity of a polyprotic acid by the thermochemical method and study of solubility of benzoic acid in water.
Semester III	
CHE-HC-3014: Inorganic Chemistry-II	On successful completion of this course students would be able ➢ To apply theoretical principles of redox chemistry in the understanding of metallurgical processes. ➢ To identify the variety of s and p block compounds and comprehend their preparation, structure, bonding, properties and uses. ➢ To explain the use of terms Hard and Soft in relation to metal ions and ligands terms of hard and soft interactions and discuss the stability of complexes. ➢ To explain chemistry of noble gases and their compounds; application of VSEPR theory in explaining structure and bonding to know about Inorganic polymers and their uses.
CHE-HC-3012: LAB	Experiments in this course will boost their quantitative estimation skills and introduce the students to preparative methods in inorganic chemistry.
CHE-HC-3024: Organic Chemistry-II	Students will be able ➢ To learn and differentiate between various organic functional groups and method of their synthesis. ➢ To classify organic compounds in terms of their functional groups and

	reactivity. ➢ To explain, analyse and design transformations between different functional groups. ➢ To learn about the different reaction mechanism involves in the given functional group transformations.
CHE-HC-3022: LAB	In this course, students will have hands on experience on test of functional groups present in a given organic sample by systematic analysis, preparation of some organic compounds using conventional method or green approach.
CHE-HC-3034: Physical Chemistry-III	The students are expected to learn ➢ Phase equilibrium and its application in some specific systems. They will also learn the most important thermodynamic property "chemical potential", the Clausius-Clapeyron equation phase diagram for one component system, solid-liquid equilibria involving eutectic, congruent and incongruent melting points etc. ➢ In the Chemical kinetics chapter they will learn rate laws of chemical transformation, experimental methods of rate law determination, steady state approximation, rate determining state approximation etc. ➢ In the Surface chemistry chapter students will be able to understand different types of surface adsorption processes and basics of catalysis including enzyme catalysis, acid base catalysis and particle size effect on catalysis.
CHE-HC-3032: LAB	On successful completion, students will be able to conduct the physical experiments of phase eqilibria viz., construction of phase diagram, determination of critical solution temperature and composition of the phenol-water system, study the effect of impurities on critical solution temperature and composition of the phenol-water system, determination of distribution coefficient, study the equilibrium and kinetic of a reaction. They will also able to study a given absorption isotherm.
Semester IV	
CHE-HC-4014: Inorganic Chemistry-III	On successful completion, students will be able to ➢ Name coordination compounds according to IUPAC, explain bonding in this class of compounds, understand their various properties in terms of CFSE and predict reactivity, d-orbital splitting in complexes, chelate effect, polynuclear, labile and inert complexes. ➢ Understanding the nomenclature of coordination compounds/

	complexes, Molecular orbital theory, d- orbital splitting in tetrahedral, octahedral, square planar complexes, chelate effects. ➢ To appreciate the general trends in the properties of transition elements in the periodic table and identify differences among the rows, and chemistry of first raw transition elements. ➢ Understanding the transition metals stability in reactions, origin of colour and magnetic properties. ➢ Understanding the separation of Lanthanides and Actinides, its colour, spectra and magnetic behaviour. ➢ Understanding the bioinorganic chemistry of metal ions in biological systems, Haemoglobin-storage and transfer of iron, Na/K pump, Carbonic anhydrase and Carboxypeptidase, about trace metals. ➢ Toxicity of various metals and mechanism of metal-biological interactions, use of chelating agents in medicine.
CHE-HC-4012: LAB	Through the experiments students will be able to prepare, estimate or separate metal complexes/compounds but also will be able to design experiments independently which they should be able to apply if and when required.
CHE-HC-4024: Organic Chemistry-III	After the completion of the course, students willlearn ➢ To identify and classify different types of N-based derivatives, alkaloids, terpenes, heterocyclic compounds and polynuclear hydrocarbonds. ➢ To explain their structureand reactivity. ➢ To critically examine their synthesis and reactions mechanism. ➢ About the synthetic applications of diazonium salts. ➢ To identify the natural source of alkaloids and terpenes and systematic elucidation of their structure.
CHE-HC-4022: LAB	In this course, students are expected to learn to detect the extra elements and function groups present in a given organic sample.
CHE-HC-4034: Physical Chemistry-IV	➢ In this course the students will learn theories of conductance and electrochemistry. ➢ Students will also understand some very important topics such as solubility and solubility products, ionic products of water, conductometric titrations etc. ➢ The students are also expected to understand the various parts of electrochemical cells along with Faraday's Laws of electrolysis.

	➢ The students will also gain basic theoretical idea of electrical & magnetic properties of atoms and molecules.
CHE-HC-4032: LAB	On completion of the course, the student should be able to determine a cell constant, equivalent conductance, degree of dissociation and dissociation constant of a weak acid, to perform various conductometric and potentiometric acid-base titrations.
Semester V	
PAPER M 501 : Quantum Chemistry	On completion of the course, the student should be able ➢ To account for the basic principles and concepts of quantum mechanics, solve the Schrödinger equation for model systems of relevance within chemistry and physics. ➢ To describe many-electron atoms with the independent particle model, describe the structure of the periodic system and the connections between the properties of the elements and their electron configurations. ➢ To describe the chemical bonding quantum mechanically with molecular orbital theory, describe the bases behind interaction between light and matter.
PAPER M 502 : Physical Chemistry	In this course students will learn- ➢ In the reaction dynamics chapter they will learn details of what happens to molecules at the climax of reaction encounter, collision theory, transition state theory and their application to derive rate laws. ➢ In the photochemistry chapter they will learn the various mechanisms involved in photochemical reactions along with the concept of fluorescence, phosphorescence and consequences of light absorption with the help of Jablonski diagram. ➢ In the Phase equilibrium they will learn Phase equilibrium and its application in some specific systems. They will also learn the most important thermodynamic property “chemical potential”, the Clausius-Clapeyron equation phase diagram for one component system, solid-liquid equilibria involving eutectic, congruent and incongruent melting points etc. ➢ In the surface chemistry they will learn various adsorption processes, adsorption isotherms, determination of surface area and catalytic activity at the surface.
PAPER M 503 :	In this course the students will able

Organic Chemistry	➢ To change the connectivity of an existing organic backbone by using reactions that result in skeletal rearrangements. ➢ To identify different types of oxidising and reducing agents as well as the properties of the reagents. ➢ To make use of those different reagents in organic synthesis and they can do it in different pathways. ➢ To identify different pericyclic reactions and to predict the condition for allowance of pericyclic reactions. ➢ To draw the MOs for polyenes, identify the FMO's (HOMO &LUMO) participating in the pericyclic reaction& explain the importance of MO's in pericyclic reactions. ➢ To predict the products& the stereochemistry of the product of the Pericyclic reactions. ➢ To explain the structure, bonding and physical and chemical properties of polynuclear aromatic hydrocarbons and heterocyclic compounds. ➢ To critically examine their synthesis and reactions mechanism. ➢ To learn the synthetic method, physical properties and reactivity of organic nitro and amino compounds, organo S and organo P compounds. ➢ To recognise the active methylene compounds, to learn the method of their synthesis and applications in organic synthesis.
PAPER M 504 : Inorganic Chemistry	In this course the students will be able to learn ➢ The symmetry elements and operations, point group classification, Symmetry of octahedron, tetrahedron and square planar complexes. ➢ Structure and symmetry of inorganic compounds, Shape and symmetry of s, p and d orbitals. ➢ The concepts of metal ligand bonding in transition complex compounds, the thermodynamics and kinetic aspects of metal complexes. ➢ To identify the basic concept, terms and importance andthe chemistry of organometallic compounds, homogeneous hydrogenation and carbonyls, the 18-electron rule and its violation. ➢ To learn about the common organometallic reactions and to be able to draw reasonable reaction mechanisms. ➢ Be able to use knowledge about structure and bonding issues to understand the stability and reactivity of simple organometallic

	complexes. ➢ To understand the importance of Na/K salts and calcium in biology ➢ To understand the bioinorganic chemistry of haemoglobin, myoglobin, etc. ➢ To recognize role of porphyrin ring in haemoglobin.
PAPER M 505 : Practical	In this course, students are expected to learn the utilization of quantitative estimation of inorganic ions by volumetry, complexometry, gravimetry, colorimetry, redox and precipitation methods in laboratory. They are also expected to learn the chromatographic method of separation of cations by paper/TLC.
PAPER M 506 : Practical	In this course, students are expected to learn to prepare organic compounds and the quantitative organic analysis.
Semester VI	
PAPER M 601: Spectroscopy	In this course the students will ➢ Learn the most common spectroscopic methods and their possibilities and limitations for studies of molecules in the IR and UV/Vis MW, IR and UV-Vis areas. ➢ Calculate different molecular parameters for simple molecules from their NMR, IR, Raman and UV-Vis spectra. ➢ Account for how spectroscopic methods can be used to determine molecular structures, with focus on the identification of characteristic groups in polyatomic molecules on the basis of their IR and UV-Vis spectra. ➢ Account for different types of electronic transitions and de-excitation process and interpret absorption and fluorescence spectra. ➢ Use UV-Vis absorption and emission spectrometers and be able to account for their function.
PAPER M 602: Physical Chemistry	In this course the students will learn about solids state, Macromolecules and colloids, statistical thermodynamics and data analysis.
PAPER M 603: Organic Chemistry	By the end of the course, the student must ➢ Have deep understanding on the theory andprincipleinvolved in the photochemical and photophysical processes. ➢ Have understanding on the differences between photoreaction and thermal reaction, characteristics of photochemistry, application of photochemical reactions, fundamental laws of photochemistry,

	efficiency in photochemical reactions, significance of Jabolonski diagram. ➢ Have clearunderstanding of what is fibre and polymer, the classification of polymers based on the mechanism of polymerisation reaction, based on properties of the polymer and based on the source, their preparation, properties and applications. ➢ Have a specialised knowledge on the structure of biopolymers have and their importance. ➢ Have understanding on the structures and purposes of basic components of prokaryotic and eukaryotic cells. ➢ Have good knowledge on concentration gradient, ion transport across the cell membrane. ➢ Have clearunderstanding on the catalytic role of enzymes, importance of metalloenzyme, coenzymes and vitamins. ➢ Able to draw the structure of carbohydrates, lipids, proteins, amino acids, haemoglobin and myoglobin and have knowledge on their functions in biological systems. ➢ Have learned the structure of nucleotides, nucleocides, DNA, RNA and the hydrogen bondings of purines and pyrimidines bases in their structure. ➢ Have clear understanding on the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins. ➢ Able to recognise and categorise the classes of natural product. ➢ Have good knowledge on the extraction, separation, isolation and structure elucidation of the natural products. Students must also have understanding on the importance of those natural products. ➢ Have learnt to draw the structure of the carbohydrates, to predict the configuration carbohydrate molecules and knowledge on the methods of their synthesis. ➢ Have deep good understanding of the chemistry of drugs with respect to their pharmacological activity, the drug metabolic pathways, adverse effect and therapeutic value of drugs, knowledge of the Structural Activity Relationship (SAR) of different class of drugs and the chemical synthesis of some drugs, the classificationchiral drugs, asymmetric drug synthesis and the importance of asymmetric synthesis.

	➢ Have understanding onthe fundamentals of biological energy production that is how cells harvest chemical energy by oxidizing glucose to pyruvate and how the products of photosynthesis function as the inputs of cell respiration.
PAPER M 604: Inorganic Chemistry	After the completion of course, students will be able ➢ To understand free ion terms and their splitting, Orgal diagram, selection rule, vibronic coupling and colour of complexes. ➢ To understand the electronic spectra of metal complex ions. ➢ To understand the thermodynamics and kinetic aspects of metal complexes, formation constants, kinetic lability and inertness, Chelate effect. ➢ To explain the terms stepwise stability constant and overall constants. ➢ To give appropriate definitions of the terms inert and labile and state which d- electron configurations are associated with inertness. ➢ To know mechanism of ligand displacement reactions. ➢ To determine of composition of ionic compounds by conductometry. ➢ Theory of redox and complexometric titrations. ➢ Students are able to describe role of different metal ions in biological system. ➢ Toxicity of metal ions, effect of gases and polluted environments. ➢ Importance of metal salts in diet, diagnosis, chemotherapy and as medicines. ➢ To identify and define various types of nuclear transmutation including fission, fusion reactions. ➢ To understand about radioactivity radioactive emissions and decay reactions. ➢ Use of proper isotopic notation to write down and balance a nuclear reaction. ➢ State and compare the differences and similarities between a nuclear change and chemical change. ➢ To calculate each for a given nucleus. ➢ To define binding energy and mass defect and be able to calculate each for a given nucleus. ➢ To understand the concept of rate of change and half-life in the context of nuclear decay. ➢ To understand the basics of nuclear chemistry applications: nuclear

	power, medical treatment, isotopic labelling and carbon dating. ➢ Lanthanoids, Actinoids – separation, color, spectra and magnetic behavior. ➢ Use of lanthanoids/actinoid compounds. ➢ Understanding the separation of lanthanoids and actinoids, its color, spectra and magnetic behavior.
PAPER M 605: Practical	In this course,students will have hands on experience on various physical chemistry experiments viz., determination of cooefficient of viscosity, surface tension, mutual solubility of two liquids, molecular mass of volatile liquid, specific rotation of an optically active substance, specific rotation rate, kinetic of a reaction, distribution coefficient andtest of validity of Beer-Lambert's law. They will also learn to carry out coductometric titration and potentiometric titration.
PAPER M 606: Project Work	In this course students will ➢ Understand the objectives of doing scientific research. ➢ Learnhow to identify the area of research to be conducted, how to proceed for literaturesurvey using a variety of sources and how to write research project withwell laid hypothesis and objectives. ➢ Learn the skills of research design,nature of sample size as well as collection and analysis of data. ➢ Also knowthe skills of writing research report and making oral presentations.

Course Outcomes: B. Sc. Chemistry (General Course/Regular Course/Generic Elective)

Semester I	
Course	**Outcomes**
CHE-RC/HG-1014: Chemistry-1	After completion of this course the students will learn the atomic structure through basic concept of quantum mechanics. They will understand the chemical bonding through VB and MO approaches. In organic part, the students are expected to learn basic ideas used in organic chemistry, stereochemistry, functional groups, alkanes, alkenes and alkynes.
CHE-RC/HG-1012-LAB: Chemistry-1	In this course, students will have hands on experience on volumetric analysis of some inorganic salts and metal ions. In organic chemistry part students will learn to detect extra element present in the given organic sample through systematic analysis. They will also learn to carry out chromatographic separation of a given organic mixture.

Semester II	
CHE-RC/HG-2014: Chemistry-2	After completion of this course the students will learn periodic properties in main group elements, transition elements. They will also learn the crystal field theory in coordination chemistry unit. In physical chemistry part, the students are expected to learn kinetic theory of gases, ideal gases and real gases, surface tension, viscosity, basic solid state chemistry and chemical kinetics.
CHE-RC/HG-2012-LAB: Chemistry-2	Working through this course, students are expected to develop their skills and knowledge for semi-micro qualitative analysis of at least mixture of four ionic species and quantitative measurement of various ions in a given solution. They will also learn to measure surface tension and viscosity of a liquid, kinetics of certain reactions.
Semester III	
CHE-RC/HG-3014: Chemistry-3	After completion of this course the students will able to understand the chemical system from thermodynamic point of view. They will also learn two very important topics in chemistry-chemical equilibrium and ionic equilibrium. In organic chemistry part, the students are expected to learn various classes of organic molecules-alkyl halides, aryl halides, alcohols, phenols, ethers, aldehydes and ketones.
CHE-RC/HG-3012-LAB: Chemistry-3	In this course, students will have hands on experience on the measurement of P^H of commercially available food drinks, shampoos and soaps. Also gain experience of preparing buffer solution and measurement of its pH. In the organic part, students will learn to purify organic compounds by crystallisation, recrystallisation and distillation. They are also expected to learn organic synthesis and check the purity of the synthesized compounds by measuring their melting point and boiling points.
CHE-SE-3034: Basic Analytical Chemistry	Upon completion of this course, students will be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
Semester IV	
CHE-RC/HG-4014: Chemistry-4	After completion of this course the students will learn solutions, phase rule and its application in specific cases, basic of conductance and electrochemistry. Students will also learn some important topics of organic and biochemistry-carboxylic acids, amines, amino acids, peptides, proteins and carbohydrates.

CHE-RC/HG-4012- LAB: Chemistry-4	In this course, students will learn to conduct the study of equilibrium of a given reaction, phase equilibrium, determination of conductance and potentiometric acid-base titration. In the organic part, they will learn the systematic qualitative organic analysis, preparation of derivatives and chromatographic separation of organic mixtures, determination, differentiation and extraction of organic compounds using specified analytical techniques.
Semester V	
PAPER E 501: General Chemistry	On completion of the course, the student should be able to account for the ➢ Bonding in solid: Band theory. ➢ Electronic properties of solids relating electrical conductivity, conductors, insulators semiconductors, Intrinsic and extrinsic semiconductors. ➢ Ferroelectric and Piezoelectric material and preparation of electronic grade pure silicon.
PAPER E 502: Practical	
Semester VI	
PAPER E 601: General Chemistry	After completion of this course, students will ➢ Have in depth knowledge of basic and applied area of Industrial Chemistry. Students will learn what is polymer, their classification, mechanism of polymerisation, manufacture of certain polymers and also learn their structure, properties and applications. ➢ Gain knowledge on how to prepared coal by Fisher-Tropsch process and isolate various chemicals from coal. They will also learn how various hydrocarbons can be obtained industrially from petroleum, industrial reactions involving those hydrocarbons, the synthetic process of methanol from natural gas, synthesis of petrol, LPG, CNG and biodiesel. ➢ Learndetails of the production of soap and detergents industrially from oils and fats, understand the principle of cleansing action of soap and detergents, industrial applications of enzymes in the production of alcohol by fermentation of sugars. ➢ Recognize the different types of air and water pollutant, sources of the pollutions, the toxic effects the pollutants. Students will get aware of the permissible limits of those pollutants in both air and water and measures to control the pollutions.Appreciate the ethical context of

	environmental issues and the links between human and natural systems. ➢ Get insight of the structures and purposes of basic components of prokaryotic and eukaryotic cells, cell membrane andhave good knowledge on concentration gradient, ion and molecule transport across the cell membrane, the structure and functions of amino acids and proteins. ➢ Have learnt to draw the structure of the carbohydrates, to predict the configuration carbohydrate molecules and knowledge on the methods of their synthesis. ➢ Learn the details of the structure of DNA and RNA, have clear understanding on the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins. ➢ Have good knowledge on the catalytic role of enzymes, the hypothesis of Lock-key model of enzyme-receptor interaction, importance of metalloenzyme, coenzymes and vitamins. ➢ Students will conceptualize how various biomolecules are metabolized inside the body in order to produce energy for various functions and how various metabolic pathways regulate growth and development of living beings. Students will know about role of high energy compounds, how carbohydrates serve as energy source to power various functions ➢ Have good knowledge on the extraction, separation, isolation and structure elucidation of the natural products terpenes and alkaloids. Students must also have understanding on the physiological action of alkaloids ➢ Learn details about the structure of hormone, their functions in biological system and the role of neurotransmitter in their action. ➢ Have good understanding of the chemistry of drugs with respect to their pharmacological activity, learn the structure of variousantibiotic, antimalarial, anticancer drugs, their uses and metabolic pathways
PAPER E 602: Practical	In this course students will able to determine the hardness of water by complexometric titration, equivalent mass by titrimetrically, study the kinetics of a reaction, carry acid-base conductometric titration. In the inorganic part, they will learn to prepare double salt and complex salt.

Signature of HOD

DEPARTMENT OF COMPUTER SCIENCE

BISWANATH COLLEGE

PROGRAMME OUTCOME AND COURSE OUTCOMES

PROGRAMME: B.C.A.

About BCA Programme

The Bachelor of Computer Application (BCA) is a 3-year (6 semesters) undergraduate degree programme affiliated to Gauhati University. It is valuable for the students wishing to learn about the world of computer languages and information technology. It caters to students with specific interests with the core computer science courses and wide range of skill enhancement and elective courses. The course aims to develop students with intellectual and logical skills and at the same time implementation of mathematical and physics problems using popular programming languages.

The department mainly focuses on skilling the students in numerous courses like Data Structure & Algorithms, Programming Languages, Computer Architecture, Operating System, Database Management System, Computer Networks, Numerical Analysis, Data Mining etc. To facilitate continuous learning the department has taken various approaches to bring theoretical and practical knowledge to the students.

Programme Outcome

After successful completion of three years degree programme in BCA the students will be able to:

1. Develop programming & logical skills, networking skills and modern techniques of IT.
2. Learn different programming languages such as C, C++, Java, and VB.NET.
3. Design and implement organization specific databases using latest technologies.
4. Design and analyze algorithms as per need by relating the data structure and algorithms.
5. Get detailed idea of design principles of Operating Systems.
6. Develop organization specific software, web sites and mobile applications.
7. Work as Software Engineer, Mobile Application Developer, Software Tester, Junior Programmer, Web Developer, System Administrator etc.
8. Get skills about research & technical writing, graphing, data analysis and computer presentation using LaTex, SciLab and Office Automation.
9. Develop strong communication skills in both written and verbal.

10. Understand contemporary issues and provide engineering solutions for solving social problems.
11. Get skill and information not only about computer and information technology but also in common organization and management.

Program Specific Outcomes

1. Pursue higher studies in the area of Computer Science/Applications
2. Knowledge of computer system architecture.
3. Knowledge of Compilation and execution of computer programs.
4. Knowledge of word processing and its applications.
5. Application of networking in organizations.
6. Application of algorithms in research and development.
7. Application of *data-mining* techniques in financial analysis and higher education.
8. Uses of computers in Education such as distance learning, online examinations and online training resources.

Course Outcomes Of BCA Core Paper(cbcs)

Course	**Outcomes (After the course the students are expected to be able to)**
SEMESTER 1	
BCA-HC-1016 **Introduction to C Programming**	● Demonstrate an understanding of computer programming language concepts. ● Build up the foundation of programming along with the concepts of data structures, functions and other core part of C Programming. ● Implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems. ● Identify the problem, solve it using logical reasoning and implement it by writing C programs instructing computers to effectively solve the task.
BCA-HC-1026 **Computer Fundamentals & ICT Hardware**	➢ Selecting search results in a systematic and coherent fashion, according to the set targets; ➢ Analysing information quality using approved instruments; ➢ Analysing the relevance of information in the context of a given project; ➢ Learning criteria for assaying the credibility of information sources;

	➢ Assessing the quality of the information collected by checking different sources, authorship and up-to-datedness.
SEMESTER II	
BCA-HC-2016 **Mathematics–I**	➢ Understand the foundations of mathematics. ➢ Be able to perform basic computations in higher mathematics. ➢ Be able to read and understand middle-level proofs. ➢ Be able to write and understand basic proofs. ➢ Develop and maintain problem-solving skills. ➢ Use mathematical ideas to model real-world problems
BCA-HC-2026 **Digital Logic Fundamentals**	➢ Convert different type of codes and number systems which are used in digital communication and computer systems. ➢ Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy,performance and efficiency. ➢ Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods. ➢ Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.
SEMESTER III	
BCA-HC-3016 Software Engineering	➢ Basic knowledge and understanding of the analysis and design of complex systems. ➢ Ability to apply software engineering principles and techniques.
BCA-HC-3026 Data Structure and Algorithms	➢ Ability to analyze algorithms and aalgorithm correctness. ➢ Ability to summarize searching and sorting techniques ➢ Ability to describe stack,queue and linked list operation.

	➢ Ability to have knowledge of treeand graphs concepts
BCA-HC-3036 Database Management System	● Understand the concept of database and database management system. ● Understand the file system Vs database system. ● Design any database system wherever required.
SEMESTER IV	
BCA-HC-4016 Computer Organization and Architecture	➢ Describe the fundamental organisation of a computer system ➢ Explain the functional units of a processor ➢ Explain addressing modes, instruction formats and program control statements
BCA-HC-4026 Mathematics-II	➢ Understand the foundations of mathematics. ➢ Be able to perform basic computations in higher mathematics. ➢ Be able to read and understand middle-level proofs. ➢ Be able to write and understand basic proofs. ➢ Develop and maintain problem-solving skills. ➢ Use mathematical ideas to model real-world problems.
BCA-HC-4036 Object Oriented Programming in C++	➢ To describe the advantages of a high level language like C/C++, the programming process, and the compilation process. ... ➢ To describe and use software tools in the programming process. ... ➢ To apply good programming principles to the design and implementation of C/C++ programs.
SEMESTER V(TDC)	
BCA 5.1 System Administration using Linux	➢ Explain the fundamental concepts of open-source operating system Linux ➢ Understand the basic set of commands and editors in Linux operating system. ➢ Discuss shell programming in Linux operating system ➢ Demonstrate the role and responsibilities of a Linux system administrator. ➢ Distinguish various filter and server commands
BCA 5.2 Computer Networks	➢ Recognize the technological trends of Computer Networking. ➢ Discuss the key technological components of the

	Network. ➢ Evaluate the challenges in building networks and solutions to those.
BCA 5.3 Open Source Software	➢ Ability to build and modify one or more Free and Open Source Software packages. ➢ Ability to use a version control system and to interface with version control systems used by development communities. ➢ Ability to contribute software to and interact with Free and Open Source Software development projects.
SEMESTER VI(TDC)	
General Elective	
BCA Elective 6.1Data Mining & Warehousing (5-1-0-6)	➢ **Identify the key processes of data mining, data warehousing and knowledge discovery process.** ➢ **Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses.** ➢ **Apply data mining techniques to solve problems in other disciplines in a mathematical way.**
BCA Elective 6.2Cyber Law (5-1-0-6)	• **Analyze and evaluate the cyber security needs of an organization.** • **Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.** • **Measure the performance and troubleshoot cyber security systems.** • **Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.** • **Comprehend and execute risk management processes, risk treatment methods.**

General Elective(cbcs)

SEMESTER-I

GE 1B: BCA-HG-1026: Office Automation	· to perform documentation · to perform accounting operations · to perform presentation skills

SEMESTER-II

GE 2B: BCA-HG-2026:Introduction to Bio-Informatics	➢ Classify different types of Biological Databases. ➢ Introduction to the basics of sequence alignment and analysis. ➢ Overview about biological macromolecular structures and structure prediction methods. ➢ To gain knowledge about various Biological databases that provide information about nucleic acids and protein.

SEMESTER-III

GE 3A: BCA-HG-3016:Introduction to Indian History	• This course is an introductory paper intending to introduce prehistory, protohistory and important political events till 400 BCE of India to the students. • The course also intends to give a brief idea about the different sources and the changing interpretations of ancient Indian history.

SEMESTER-IV

GE 4B: BCA-HG-4026:Information Security and Cyber Laws	➢ Make Learner Conversant With The Social And Intellectual Property Issues Emerging From ‘Cyberspace. ➢ Explore The Legal And Policy Developments In Various Countries To Regulate Cyberspace ➢ Develop The Understanding Of Relationship Between Commerce And Cyberspace ➢ Give Learners In Depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection. ➢ Make Study On Various Case Studies On Real Time Crimes

SEMESTER-V/TDC

Computer Oriented Numerical Methods and Statistical techniques (5-0-1-6)	➢ Recognize the error in the number generated by the solution. ➢ Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method. ➢ Apply method of interpolation and extrapolation for prediction. ➢ Recognize elements and variable in statistics and summarize qualitative and quantitative data. ➢ Calculate mean, median and mode for individual series. ➢ Outline properties of correlation and compute Karl-Pearson's coefficient of correlation.

Skill Enhanement Course(cbcs)

SEMESTER-III

SEC-1C: BCA-SE-3034: Open Source Software	• Ability to build and modify one or more Free and Open Source Software packages. • Ability to use a version control system and to interface with version control systems used by development communities. • Ability to contribute software to and interact with Free and Open Source Software development projects.

SEMESTER-IV

SEC-2B: BCA-SE-4024: Mobile Applications	➢ Recognizes the concept of application development for mobile devices. ➢ Recognizes mobile development environments. ➢ Explains the basic concepts of Android phone features and capabilities. ➢ Understands the basic technologies used by the Android platform.

Ability Enhancement Compulsory Course(cbcs)

SEMESTER-I

(English Communication) ENG-AE-1014/	➢ develop vocabulary and improve the accuracy in grammar. ➢ produce words with right pronunciation. ➢ Improve LSRW- listening, speaking, reading and writing skills and the related sub-skills. ➢ demonstrate positive group communication exchanges.

SEMESTER-II

Environmental Science ENV-AE-2024/	➢ Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. ➢ Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.

Practical/Minor/Major Project(cbcs/Tdc)

SEMESTER-I

Lab work using C Language	➢ Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems. ➢ Demonstrate an understanding of computer programming language concepts. ➢ To be able to develop C programs on linux platform. ➢ Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage. ➢ Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures. Student must be able to define union and

	enumeration user defined data types. ➢ Develop confidence for self education and ability for life-long learning needed for Computer language.
Lab work using ICT Tools	➢ How to install software ➢ How to format tools and device ➢ How to use monitor and keyboard properly

SEMESTER-III

Lab work of Data Structure	➢ Develop simple C Programs using pointers and Functions ➢ Develop C program for Linear data structure operations and its applications ➢ Experiment with File Manipulation concepts ➢ Develop programs using various sorting algorithms ➢ Develop programs using different searching methods
Lab work of DBMS	➢ Apply the basic concepts of Database Systems and Applications. ➢ Use the basics of SQL and construct queries using SQL in database creation and interaction. ➢ Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system. ➢ Analyze and Select storage and recovery techniques of database system

SEMESTER-IV

Lab work using C++	➢ Creating simple programs using classes and objects in C++. ➢ Implement Object Oriented Programming Concepts in C++. ➢ Develop applications using stream I/O and file I/O. ➢ Implement simple graphical user interfaces. ➢ Implement Object Oriented Programs using templates and exceptional

	handling concepts.

SEMESTER-V/TDC

Lab work using Linux	• To learn to develop software for Linux/UNIX systems. • To learn the C language and get experience programming in C. • To learn the important Linux/UNIX library functions and system calls. • To understand the inner workings of UNIX-like operating systems. • To obtain a foundation for an advanced course in operating systems.
Lab work of OSS	• Compiling from source : Learn about the various build systems used like the cmake /make / ant etc. instead of just running the commands. • Introduction to package management system : Given set of RPM or DEB, how to build and maintain , serve packages over http or ftp. And also how do you configure client systems to access the package repository. • Install various software packages • Install Samba and share files to windows • Install Common Unix Printing System (CUPS)

SEMESTER-VI/TDC

Major Project	➢ Students will prepare their individual project based on different language like java,C,Php,Asp.net HTML,CSS etc and create various web based and android based project

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Head
Department of Computer Science

DEPARTMENT OF ECONOMICS
BISWANATH COLLEGE
PROGRAMME OUTCOMES

Link to the GU syllabus:

1. Economics Honours (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/economics
2. Economics Regular (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/economics
3. Economics Major/general (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-economics

PROGRAMME: B.A. ECONOMICS

1. Knowledge and Understanding:

a. Theoretical Knowledge on Economic variables, issues and Challenges
b. Practical knowledge on how micro and macroeconomic concepts can be applied to analyze real life situations
c. Application of mathematical tools to calculate economic variables and interpreting the results.
d. Application of Statistics in interpreting Economic Phenomenon.
e. Knowledge on impact of Economic Development on Environment and urge for sustainable development.
f. Detailed knowledge on global environmental issues and how to mitigate environmental pollutions.
g. Knowledge on how to behave as a rational consumer.
h. Useful for students aiming towards careers in the government sector, policy analysis, business and journalism.

2.Intellectual Skills:

a. In-depth knowledge on various economic issues
b. Exploration of socio-economic issues related to human development, environment and sustainable development though observation, media and internet sources.
c. Capacity building for sample survey related to economic issues and environment.

3. .Practical Skills:

a. Study of economic problems like poverty, unemployment, standard of living etc.
b. Consumer survey, Population Survey, Data entry and interpretation, Cost-benefit analysis
c. Field study of the local area to know about the economic issues related to the inhabitants
d. Skill on Software's to entry and interprets data.

4. Transferable Skills:

a. Information technology for accumulation and sharing of data.
b. Dissemination of ideas in writing and interpreting, considering the economic aspects
c. Team spirit.
d. Access of E- resources.

5. Scientific Knowledge and problem analysis:

Application of principles of economics in studying and analysing socio-economic problems and phenomena related to the economy.

6.Usage of Modern tools:

a. Practical application of online teaching-learning platform like Zoom, Cisco Webex, Google Classroom etc.

b. Software like MS Excel, SPSS/PSPP

7. **Ethics**:

1. Promoting self interest and achieve happiness without interfering anyone's Interest.
2. Equal distribution of wealth and opportunity to check the destruction of social cohesion.
3. Application of moral and ethical principles to mitigate environmental issues and maintain sustainable development.

Dr. Karabi Gogoi
Head
Dept. of Economics

DEPARTMENT OF ECONOMICS

BISWANATH COLLEGE

Course Specific Outcomes (CBCS)

B.A. Economics Honours

Biswanath College is affiliated to Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. Gauhati University course curriculum for Economics Honours under CBCS has mentioned some course outcomes while designing the curriculum. However, the college expects more outcomes from the course. Course specific outcomes of Economics Honours, CBCS is summarized below.

Semester: I

ECO-HC-1016: Introductory Microeconomics

- Knowledge on the basic principles of microeconomic theory.
- Emphasis on thinking like an economist
- Practical knowledge on how macroeconomic concepts can be applied to analyze real life situations.

ECO-HC-1026: Mathematical Methods of Economics-I

- Basic knowledge on transmit the body of basic mathematics in order to study the economic theory.
- Illustration of the method of applying Mathematical Techniques to economic theory in general.

Semester: II

ECO-HC-2016: Introductory Macroeconomics

- Basic knowledge on the Concepts of Macroeconomics.

- Basic knowledge on the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, GDP, money, inflation, and the balance of payments.

ECO-HC-2026: Mathematical Methods in Economics-II

- Basic knowledge on transmit the body of basic mathematics in order to study the economic theory.
- Illustration of the method of applying Mathematical Techniques to economic theory in general.

Semester: III

ECO-HC-3016: Intermediate Microeconomics – I

- Basic knowledge on the behaviour of individual agents.
- Basic knowledge on application of mathematical tools to understand the basic concepts of microeconomics.

ECO-HC-3026: Intermediate Macroeconomics

- Knowledge on the various alternative theories of output and employment determination in a closed economy in the short run as well as medium run.
- Basic knowledge on the role of policy in output and employment determination.
- Knowledge on various theoretical issues related to an open economy.

ECO-HC-3036: Statistical Methods for Economics

- Detailed Knowledge on the basic concepts and terminology that are fundamental to statistical analysis and inference.
- Knowledge on probability, probability distributions of discrete and continuous random variables, and joint distribution.
- Knowledge through detailed discussion on sampling techniques used to collect survey data.
- Basic knowledge on sampling distributions – a bridge between probability theory and statistical inference**.**

Semester: IV

ECO-HC-4016: Intermediate Microeconomics-II

- Knowledge on the general equilibrium and welfare, imperfect markets and topics under information economics**.**
- Emphasis on the use of mathematical tools and reasoning to make conceptual clarity.

ECO-HC-4026: Intermediate Macroeconomics-II

- Detailed knowledge on long run dynamic issues like growth and technical progress.
- Knowledge on the various aggregative concepts previously used to build micro-foundations.

ECO-HC-4036: Introductory Econometrics

- Basic knowledge on econometric concepts and techniques**.**
- Knowledge on the statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models.
- Knowledge on the consequences of misspecification of regression models.

COURSE SPECIFIC OUTCOME (NON CBCS)

Semester: V

M 501Elements of Public Finance

- Knowledge on the nature and scope of public finance.
- Detailed knowledge on public revenue – concepts of revenue receipt and non-revenue receipt, tax and non-tax revenues.
- Knowledge on sources and classifications of public revenue.
- Detailed knowledge on public expenditure, classifications and cannons, Wagner's law, effects on production, distribution and economic stability.
- Knowledge on importance of public expenditure in developing countries.
- Detailed knowledge on public debt- sources, burden, redemption of public debt, debt trap.
- Knowledge on role of public debt in developing countries.

M 502 Basic Statistics for Economics

- Theoretical knowledge on central tendency and dispersion.
- Knowledge on various methods of numerical calculations of central tendency and dispersion.
- Detailed knowledge on correlation and regression.
- Knowledge on concepts of probability, random variables and mathematical expectation relating to discrete random variables.

- Basic knowledge on standard probability distributions – Binomial, Poisson and Normal.

M503 Introduction to Environmental Economics

- Knowledge on the nature and scope of environmental economics, Economy-environment interaction
- Detailed knowledge on market failure, externality and public good, tragedy of commons.
- Knowledge on the Environmental Kuznets's curve and pollution control policies.
- Detailed knowledge on global environmental issues.

M504 International Trade: Theory and Policy

- Detailed knowledge on the theories of international trade – Ricardian, Heckscher-Ohlin, Leontief Paradox, factor intensity reversal.
- Knowledge on terms of trade and gains from trade- various concepts and factors affecting the ToT, offer curves, distribution of gains from trade, trade as an engine of growth.
- Detailed knowledge on international trade policy-free trade vs protection, concepts and effects of tariff, optimum tariff and retaliation, types and effects of quotas, optimum tariff and retaliation.

M505 History of Economic Thought-I

- Knowledge on early period- Mercantilism and physiocracy
- Knowledge on classical period- Contributions of Adam Smith, David Ricardo, Thomas Robert Malthus, J.B. Say and J.S.Mill.

M506 Development Policy and the Indian Economy

- Knowledge on the basic features of the Indian economy and increasing importance of tertiary sector.
- Detailed knowledge on poverty, inequality and unemployment – conceptual and measurement issues in the Indian context.
- Detailed knowledge on the role of agriculture in economic development, barriers to agricultural growth, land reforms measures in India, green revolution ,food security and public distribution system.
- Detailed knowledge on the role of industries in the development process, overview of the industrial policy measures before and after reforms.

Semester: VI

M601 Public Economics

- Knowledge on the cannons, types and principles of taxation,
- Knowledge on the impact, incidence and shifting of taxation, taxable capacity.
- Detailed knowledge on the effects of taxation on the production and distribution system, characteristics of a good tax system.
- Knowledge on the concept and classifications of government budget.
- Detailed knowledge on the meaning, objectives, and components of fiscal policy.
- Detailed knowledge on the federal finance, current finance commissions.
- Useful for students aiming towards careers in the government sector, policy analysis, business and journalism.

M602 Applied Statistics

- Knowledge on the concept, uses, problems and methods of constructing index numbers.
- Basic knowledge on the concepts and components of time series analysis.
- Basic knowledge on the concepts and measurements of various fertility and mortality rates; Life tables.
- Knowledge on the sample survey- population, sample, parameter.

M603 Economics of Natural Resources and Sustainable Development

- Knowledge on the types and characteristics of natural resources.
- Detailed knowledge on the Economics of Renewable and Non-renewable resources.
- Knowledge on the environment-development trade-off, Sustainable development – indicators and policy issues.

M604 International Economics

- Basic knowledge on the nature and scope of international economics, international economics as a distinct branch of economics.
- Knowledge on the structure of balance of payments (BOP), types and causes of disequilibrium of BOP.
- Detailed knowledge on foreign exchange market and exchange rates.
- Knowledge on economic integration, international institutions.

M605 History of Economic Thought-II

- Knowledge on some famous schools of thought- marginal school, Austrian school, Neo-classical economics, Welfare economics.
- Knowledge on the Keynesian economics-departure from classical school.
- Detailed knowledge on the Indian Economic thought.

M606 Planning for Development: India and the North-East

- Basic knowledge on meaning, justification and types of planning.
- Broad knowledge on the planning process in India – 1951-90, strategies, goals, achievements and failures; planning in the post liberalisation period.
- Detailed knowledge on the basic features and consequences of economic globalisation in India.
- Knowledge on the FDI and FPI.
- Detailed knowledge on economic problems of north-east India.

COURSE SPECIFIC OUTCOME BA REGULAR COURSE (CBCS)

Semester: I

ECO-RC-1016: Principles of Microeconomics-I

- Expose the students to the basic Principles of Microeconomic theory.
- Illustration of the theories with applications

Semester: II

ECO-RC-2016: Principles of Microeconomics-II

- Expose the students to the basic Principles of Microeconomic theory.
- Knowledge on the theory of markets and conditions of market failure

Semester: III

ECO-RC-3016: Principles of Macroeconomics-I

- Expose the students to the basic concept of macroeconomics.
- Knowledge on various macro economic variables like GDP, Consumption, Savings, Investment etc.
- Knowledge on various theories of determining GDP in the short run.

Semester: IV (Regular)

ECO-RC-4016: Principles of Macroeconomics-II

- Knowledge on various theories of determination of National Income
- Knowledge on the concept of Inflation, its relationship with unemployment and some basic concepts in an open economy.

COURSE SPECIFIC OUTCOME BA GENERAL COURSE (NON CBCS)

Semester: V

E-503: Public Finance

- Knowledge on Public finance-sources of revenue or taxation, debt and expenditure policies as well the government mechanism to deal with a inflationary or inflationary situation.

E-504: Introduction to Economic Growth and Development

- Knowledge on the concept of growth and development, their determinants as well as hindrances of the path of economic development.
- Knowledge on the role of various sectors to Economic development of a country

Semester: VI

E-605: Indian Economy

- Detailed knowledge on the problem and prospects of Indian economy, its basic features as well as various Plan and policies relating to economic development
- Broad knowledge on the planning process in India – 1951-90, strategies, goals, achievements and failures; planning in the post liberalisation period.

E-606: International Economics

- Knowledge on the world Economy, norms of international trade between countries, functions of the world organizations
- Theoretical knowledge on causes of international trade

SKILL ENHANCEMENT COURSE (SEC)

BA Third Semester (CBCS)

ECO-SE-3014: DATA COLLECTION AND PRESENTATION

- Knowledge on use of data and presentation of data using computer software
- Knowledge on preparation of questionnaires and interview schedules
- Expose the students the methods to collect and present primary as well as secondary data

BA Fourth Semester(CBCS)

ECO-SE-4014: DATA ANALYSIS

- Knowledge on how data can be summarized and analyzed for drawing statistical inferences.
- Knowledge on important data sources
- Knowledge on statistical software like SPSS/PSPP to analyse data

- Knowledge on data entry in software like MS Excel, SPSS/PSPP
- Knowledge on statistical tools and their presentation through software.

Department of Education
Biswanath College

Programme Name: B.A. in Education

Link to GU Syllabus:

1. Education Honours (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/education
2. Education Regular (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/education
3. Education Major/General (Non-CBCS): https://sites.google.com/a/gauhati.ac.iahttps://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-education-major-generaln/syllabus-ug-old/undergraduate-courses/tdc-in-education-major-general

Programme Outcome:

- To realize that the pursuit of knowledge is a lifelong process and one can achieve the success only with untiring efforts and positive attitude.
- To develop various communication skills such as reading, listening, speaking, etc., which will be helpful in expressing ideas and views clearly and effectively?
- To realize the importance of literature in terms of aesthetic, mental, moral, intellectual development of an individual and accordingly of the society.
- To understand how issues in the social science get influenced by the literature and how the literature can provide solutions to the social issues.
- To gain the analytical ability to analyze the literature and social issues to appreciate the strength and to suggest the improvements for better results.
- To emerge as a multifaceted personality who is self-dependent; earning his own bread and butter and also creating opportunities to do so.
- To imbibe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
- To develop flair by participating in various social and cultural activities voluntarily, in order to spread knowledge, creating awareness about the social evils, blind faith, etc.

- It attempts to approach new areas of learning, develop competencies in the students thereby opening various avenues for self discovery, academic understanding and employment.

- To realize the importance of literature in terms of aesthetic, mental, moral, intellectual development of an individual and accordingly of the society.

Course Outcome:

Edu-HC-1016 : Principles of Education

- To acquaint the students with the important concepts of Education, curriculum, democracy, discipline and freedom.
- To familiarize students with democratic idea of modern education.
- To help the learners to acquire knowledge about the concept of emotional and national integration and international understanding.

Edu-HC-1026: Psychological Foundation of Education

- To make the students understand the relationship between education and psychology and explain the need of educational psychology in teaching learning process.
- To make students a better understanding about nature and theories of learning, role of motivation, theories of personality, intelligence and adjustment mechanism.

Edu-HC-3016: Development of Education

- To understand the educational situation during the time of independence and explain the educational importance of different educational commissions and committees during post independence period.
- To accustom with the recent Educational Development in India.

Edu-HC-3026: Educational technology and teaching methods

- To make the students aware about the objective of educational technology in teaching learning process and various methods and devices used in teaching.
- To acquaint students with innovations in the field of education through technology and make the students understand the strategies of effective teaching as a profession.

Edu-HC-3036: Value and Peace education:

- To understand the meaning and importance of peace education and its relevance in human life as well as national and international understanding.
- To became aware about the role of educational institutions in building a value based society.

EDU-SEC-3014 : Public Speaking Skill

- Students will able to acquire public speaking skill.

Philosophy of Education: 5.01

- To make students understand how philosophical ideas have influenced educational ideas.
- To help the learners know about the concept of philosophy and its relationship with education.

Educational Thinkers- Oriental and Occidental: 5.02

- To enable students to understand the philosophy of life of different educational thinkers and their contribution to present day educational thought.

Teacher Education: 5.03

- To explain the concept, scope, aims objectives and significance of Teacher Education.
- To develop and understanding about professional ethics and accountability of teacher.

Teaching –learning Method and Pedagogy: 5.04

- To acquaint students with the teaching learning process, the principles, maxims and fundamentals of teaching.
- To understand about teaching effectiveness and classroom management.

Statistics in Education: 5.05

- To enable the students to understand the basic concept of statistics.

- To acquaint students with different statistical Procedure used in Education.

Practical Paper: 5.06

- To enable students to understand about concept of experimental psychology and psychological experiments and tests.

Special education: 6.03

- To help students to understand about the meaning and importance of special education.
- To enable students to know about different issues ,educational provisions and support services of special education.

Guidance and counseling: 6.04

- To enable students to understand the concept, nature, scope and importance of guidance.
- To enable students to understand the role of school counselor and qualities of a good counselor.

Educational Management and Administration: 6.05

- To enable the students to understand the basic concepts of management, organization and administration.

Project work: 6.06

- To enable students to get an idea about to do a small research project by following all systematic steps of research.

DEPARTMENT OF GEOGRAPHY

BISWANATH COLLEGE

PROGRAMME OUTCOMES

Link to GU Syllabus:

1. **BA/BSc. in Geography, Honours (CBCS):** https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/geography
2. **Geography, Regular (CBCS**https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/geography
3. **B.A. in gyography, Major & general (non-CBCS):** https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-geography-general

PROGRAMME: BA/B.SC. GEOGRAPHY

1. **Knowledge and Understanding:**

   a. To Understand the Man- Environment relationship in various Physical Settings.

   b. Create an awareness of the impact of Man on the environment, society, and development outside the scientific community.
   c. Evaluation and assessment of plant and animal diversity.
   d. Understand about various Climatic phenomenons and their impact on the Globe.
   e. Value of biodiversity in terms of ecological balance and sustainable development.
   f. Application of *GIS* techniques in geography.
   g. Acquired statistical knowledge and their application in the subject.
   h. Understand about various economic activities of man and population scenario of the earth.

2. **Intellectual Skills:**

   a. Logical interpretation of problems related to social science.
   b. Dealing with various burning issues related to environment, human and sustainable development though internet.
   c. Developed various skills to control environmental problems.
   d. Demonstrate, solve and understand the major concepts in all disciplines of Geography.

e. Solve the problem and also think rationally, independently and draw a logical and scientific conclusion.

f. Capacity building for individual survey works related to nature and environment.

3. .Practical Skills:

a. Study on the various physical landforms and their evolution on the earth surface.

b. Detail study on the ocean surface and their physical settings.

c. Proper study on the various relief features on the earth surface.

d. Ecological study of the local area.

e. Scientific study on the changing earth surface through sophisticated practical instrument.

4. Transferable Skills:

a. Use of information technology for accumulation and sharing of data.

b. Dissemination of scientific ideas in writing and orally.

c. Creation of team spirit.

d. Access of E- library resources.

e. Create awareness in the Human society.

5. Scientific Knowledge and problem analysis:

a. Application of principles of basic science in studying and analysing problems and phenomena related to biological science.

b. To inculcate the scientific temperament in the students and outside the scientific community.

6. Usage of Modern tools:

a. Practical application of modern techniques/ instruments in Physical geography and Human geography.

7. Ethics:

1. Application of moral and ethical principles to mitigate environmental issues and biodiversity conservation.
2. Basic knowledge on environment and sustainable development will create responsible citizens.

Signature of Head
Deptt. Of Geography

DEPARTMENT OF GEOGRAPHY
BISWANATH COLLEGE
Course Specific Outcomes (CBCS/ NON CBCS)

BA/B.Sc. Geography Honours:

Biswanath College is an affiliated college of Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. Gauhati University course curriculum for geography Honours under CBCS has mentioned some course outcomes while designing the curriculum. However, the college expects more outcomes from the course. Course specific outcomes of geography Honours, CBCS is summarized below.

1. **Semester I:**

GGY-HC-1016: Geomorphology

a. To provide a general idea about the topographic and surfacial characteristics of the earth's surface to the students.
b. To make the students aware of the dynamic geomorphic processes responsible for the development of landforms of varied types and nature.
c. To apply scientific knowledge on landform development based on geomorphic concepts, principles and theories.
d. The students will learn that the earth is unstable and it is undergoing constant changes due to dynamic earth's processes.
e. The students will come to know about the meaning and scope of geomorphology as a major branch of Physical Geography.

f. After gaining knowledge based on the contents embodied in this paper, the students will be able to realize the importance of geomorphological knowledge as applied in various developmental activities executed in different areas.

GGY – HC- 1026: Cartographic Techniques

a. The Cartographic Techniques provides a general understanding of the field of cartography including its modern developments and importance in geographic study. It more particularly focuses on various types of map scale and their construction; principles of map projection and construction of selected few; and preparation of thematic maps through the representation of various geographical data using different cartographic techniques.
b. Understanding the importance of various cartographic techniques in geographical study.
c. General understanding of map type, map scale and map content.
d. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area.

2. Semester II

GGY- HC- 2016: Human Geography

a. The paper intends to introduce students to human geography and how humankind transforms and gets transformed by geographic space.

b. It seeks to develop new insights among students on the relevance of human-environmental relationships and how a spatial perspective shapes these relationships.
c. The subject will be useful for students in developing ideas on human-environment issues.

GGY-HC-2026: Climatology and Biogeography

a. This paper is a core paper that intends to introduce students to the rationale underlying climatological studies in geography.
b. It seeks to develop new insights among students on the relevance of climatic variables on climate change.
c. This paper intends to develop an understanding in the physical and human factors responsible for the distribution, conservation, and restriction of living organisms on the earth surface.
d. The paper will be useful for students in developing ideas on climate related aspects of geographical analyses.

e. The paper will help provide theoretical insights and perspectives to students if they wish to pursue a research programme in future.
d. Students will develop a basic understanding of the introductory concepts in biogeography.

3. Semester III

GGY-HC- 3016: Economic Geography

a. This is a core paper that intends to introduce students to the principles of economic geography and associated patterns and processes of major economic activities in the world.
b. It seeks to develop new insights among students on the relevance of economy geography and associated problems in contemporary times.
c. The paper will be useful for students in developing ideas on how geographical aspects organise economic space and will offer perspectives to students if they wish to pursue a research programme.

GGY-HC-3026: Geography of India with special reference to N.E. India

a. This is a core paper which intends to introduce students to India as a geographical entity.
b. It seeks to develop new insights among students on significant geographical dimensions of the country along with its north-eastern part.
c. A field study is incorporated to make the students understand regional diversity of India with respect to its land, people and economy.
d. The paper will be useful for students in developing understanding on Indian geography and its various dimensions.

GGY-HC-3036: Quantitative Methods in Geography

a. The paper Quantitative Methods in Geography throws light on the importance of data in geography. It deals with the methods and techniques of data collection, data tabulation, data interpretation and analysis through the application of some basic statistical measures. This paper provides an understanding of the pure and applied nature of geography along with the key elements in the discipline.

b. Thorough understanding of the statistical methods and techniques used in geographical studies;

c. Understanding of tabulation, analysis and interpretation of geographical data.

GGY-SE-3054: Thematic Cartography (Skill Enhancement Course)

a. This course on Cartographic Methods provides a general understanding of the field of cartography including its modern developments and importance in geographic study. It more particularly focuses on various types of map scale and their construction; principles of map projection and construction of selected few; and preparation of thematic maps through the representation of various geographical data using different cartographic techniques and methods.
b. Understanding the importance of various cartographic techniques in geographical study.
c. General understanding of map type, map scale and map content.
d. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area.

4. Semester IV:

GGY-HC- 4016: Environmental Geography and Disaster management

a. This paper is a core paper that intends to introduce students to geography and environment interface.
b. It seeks to develop new insights among students on the relevance of environmental studies from a spatial perspective.

c. The paper will be useful for students in developing ideas on environmental issues that geographers usually address.

GGY-HC- 4026: Population and Settlement Geography

a. To understand about the Population scenario of the world and their related problems.
b. To know about the various population characteristics and related population theories.
c. It helps the students to understand the rural urban population structure and their various issues.
d. To understand about the morphology of the various settlement pattern.
e. It helps students to understand the various settlement types and their characteristics.

GGY-HC-4036: Remote Sensing Techniques and GIS

a. This paper is a core paper that intends to introduce students to the interface of Remote Sensing and GIS.
b. It seeks to develop new insights among students on the relevance of geospatial studies within the field of geography.
c. The paper remains useful for students in developing skills in spatial data analysis if they wish to pursue a research programme.

GGY-SE–4014: Advanced Statistical Techniques for Spatial Analysis

a. This paper study on Advanced Spatial Statistical Techniques basically deals with understanding the application of different statistical measures for analysing data relating to various geographical phenomena.
b. It provides general understanding of geographical data and application of various statistical measures for their meaningful analysis
c. Acquiring basic knowledge about probability and normal distributions and their applications for sample data collection and analysis
d. Understanding the patterns and processes associated with various geographical phenomena through application of different statistical techniques.

5. Semester V: (According to CBCS)

GGY - HC -5016: Regional Planning and Development

a. This paper will introduce students to the rationale underlying the relevance of balanced regional development and spatial inequalities in geography
b. It seeks to develop new insights among students on the issue of development and disparities among geographical regions
c. The paper will be useful for students in developing ideas on disparities within and between countries and their fallout.
d. The paper will help provide theoretical insights and perspectives to students if they wish to pursue a research programme in future.

GGY-HC-5026: Social and Political Geography

a. The paper will be useful for the students in developing ideas on basic concept of social geography.
b. It deals with the social categories like- caste, class, religion, ethinicity, and gender and their spatial distribution.
c. The paper indents to provide basic concept of State, Nation and Nation State.
d. The paper will be helpful for the students to know about the various political phenomenon of a county.
e. It helps the leaner to understand various conflicts among the countries of the world.
f. The paper will be useful for the students preparing for competitive exams including state civil service exam and other national level exam.

GGY-HE-5016: Climate Change: Vulnerability and Adaptation

a. To make the students understand that climate change is a continuous process in both global and regional environments.

b. To impact information and knowledge about the impacts of climate change and the different modes of human adaptation to climate change.

c. To educate the students that climate change is a global issue and its management needs global concern and co-operation. Course outcomes.

d. The students will acquire knowledge and skill to detect the noticeable impacts of climate change in their vicinity.

e. The students may join various govt. and non-govt. agencies dealing with climate change study and mitigation.

f. The students will be able to know the extent to which the people and their economic activities are vulnerable to climatic changes and may suggest some adaptation strategies to the affected people, especially in the agricultural sector.

GGY - HC –5056: Urban Geography

a. This paper introduces students to the field of urban geography and its specificities.

b. It seeks to develop new insights among students on the relevance of an urban economy and geography and associated problems in a rapidly urbanizing world.

c. The paper will be useful for students in developing ideas on how geographical factors organize urban spaces and how geographers seek to address city specific problems and issues.

d. It will build skills for students seeking to enrol in a research programme and/or provide openings for them with urban/city planning agencies.

6. Semester VI

GGY - HC – 6016: Geographical Thought

a. This paper is a core paper that intends to introduce students to philosophical and methodological issues in the development of the discipline of geography.
b. To assess the nature and trend of ancient, modern and post-modern trends in the field of geography
c. The paper will be useful for students in understanding perspectives on the development and contemporary trends in geography and its systematic study.

GGY - HC - 6026 Geography of Resources and Development

a. This theory course basically deals with concept of resource and its classification, and the distribution, utilization and management of land, water, forest and energy resources. It also focuses on the natural resource base of North-East India and its problems of conservation and management. Besides, it also provides basic idea about sustainable development of resources.

b. Understanding the basic concept of resource and its various types and their utilities.

c. Acquiring basic information about potentials and management of resources like land, water, forest and power in global context.

d. Understanding the prevailing natural resource potential of North-East India and problems of management.

GGY - HE – 6036: Sustainable Development

a. The paper highlights on the basics of sustainability including the millennium development goals. It also focuses on sustainable and inclusive development along with environmental management. Sustainable development policies and programmes including the principles of good governance are also discussed in the paper.

b. To understanding about the concept of sustainability, sustainable development and inclusive development.

c. Knowledge of sustainable development policies and programmes.

d. Deeper knowledge of the national environmental policy, and the principles of good governance.

GGY - HE – 6044: Research Methods and Project Work

a. The paper Research Methods (Practical) is will enable students to understand how to approach a research problem and to formulate research objectives and research questions in proper perspective. In addition, knowledge of formulating of hypothesis and testing, framing of questionnaires, understand both qualitative and quantitative techniques of data collection and analyze the same Understand the basics and utility of review of literature and preparation of research report.

b. This course will help students to proceed with a research problem and the steps she/he should adopt and the tools and craft to be employed which doing quality research.

7. Semester V (According to Non- CBCS)

GGY- HC- 501: Concept of Regional Development Planning and Geography of Development of USA and JAPAN

a. This paper will introduce students to the rationale underlying the relevance of balanced regional development and spatial inequalities in geography.
b. It seeks to develop new insights among students on the issue of development and disparities among geographical regions of USA and JAPAN.
c. The paper will be useful for students in developing ideas on disparities within and between countries and their fallout.
d. This paper provides information and ideas of distribution of Resources among the developed countries of the world like USA and JAPAN.

GGY-HC- 502: Regional Geography of India and SAARC Nations

a. This is a core paper which intends to introduce students to India as a geographical entity.
b. It seeks to develop new insights among students on significant geographical dimensions of the country.
c. A field study is incorporated to make the students understand regional diversity of India with respect to its land, people and economy.
d. The paper will be useful for students in developing understanding on Indian geography and its various dimensions.

GGY-HC-503: Cartographic and Quantitative Methods

a. The Cartographic Techniques provides a general understanding of the field of cartography including its modern developments and importance in geographic study. It more particularly focuses on various types of map scale and their construction; principles of map projection and construction of selected few; and preparation of thematic maps through the representation of various geographical data using different cartographic techniques.
b. Understanding the importance of various cartographic techniques in geographical study.
c. General understanding of map type, map scale and map content.
d. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area.

e. Thorough understanding of the statistical methods and techniques used in geographical studies;

f. Understanding of tabulation, analysis and interpretation of geographical data.

GGY-HC-504: Population and Settlement Geography

a. To understand about the Population scenario of the world and their related problems.
b. To know about the various population characteristics and related population theories.
c. It helps the students to understand the rural urban population structure and their various issues.
d. To understand about the morphology of the various settlement pattern.
e. It helps students to understand the various settlement types and their characteristics.

GGY-HC- 505: Practical on Cartographic Methods (Surveying and Map Works)

a. This course on Surveying Techniques provides a general understanding of the field of survey including its modern tools and importance in geographic study. It more particularly focuses on various types of survey instruments; principles of different types of surveying, methods of carrying out survey for preparation of plan in different environment and representation of various objects in the plan. Course outcomes
b. Understanding the importance of various surveying techniques in geographical study.
c. General understanding of preparation of different types of plan and map.
d. An acquaintance of different surveying techniques for representation of various objects of earth's surface.

8. Semester VI:

GGY-HC-601: Environment and Development

a. This paper is a core paper that intends to introduce students to geography and environment interface.
b. It seeks to develop new insights among students on the relevance of environmental studies from a spatial perspective.
c. The paper will be useful for students in developing ideas on environmental issues that geographers usually address.

GGY-HC-602: Social and Political Geography

a. The paper will be useful for the students in developing ideas on basic concept of social geography.
b. It deals with the social categories like- caste, class, religion, ethinicity, and gender and their spatial distribution.
c. The paper indents to provide basic concept of State, Nation and Nation State.
d. The paper will be helpful for the students to know about the various political phenomenon of a county.
e. It helps the leaner to understand various conflicts among the countries of the world.
f. The paper will be useful for the students preparing for competitive exams including state civil service exam and other national level exam.

GGY-HC- 603: Regional Geography of North-east India with special focus on ASSAM

a. This is a core paper which intends to introduce students to North- East India as a geographical entity.
b. It seeks to develop new insights among students on significant geographical dimensions of the country along with its north-eastern part.
c. A field study is incorporated to make the students understand regional diversity of North- East India with respect to its land, people and economy.
d. The paper will be useful for students in developing understanding on Assam geography and its various dimensions.

GGY-HC- 604: Principles and Applications of Remote Sensing, GIS and GPS

a. This paper is a core paper that intends to introduce students to the interface of Remote Sensing and GIS.
b. It seeks to develop new insights among students on the relevance of geospatial studies within the field of geography.
c. The paper remains useful for students in developing skills in spatial data analysis if they wish to pursue a research programme.

DEPARTMENT Of HISTORY

BISWANATH COLLEGE

Course Specific Outcome (CBCS)

Link to the Gauhati University syllabus

1. History honours (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/history
2. History regular (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/history
3. History Major/ General (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-history-major

B.A. in History (Honours)

Biswanath College is an affiliated college of Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. While designing the curriculum Gauhati University has mentioned some course outcomes. However, college expects more outcomes from the course .Course specific outcomes of History Honours, CBCS is summarized below.

SEMESTER I:

HIS-HC-1016: HISTORY OF INDIA-I

- Basic knowledge about historical tools in reconstructing pre and proto history.
- Basic Knowledge about Historical Interpretation related to gender, environment, technology and regions.
- Various stages of Human evolution in India.
- Chronological distribution of stone age.
- Basic knowledge of cultures in transition.

HIS-HC-1026: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

- Basic knowledge of world cultural patterns.
- Knowledge of stages of the evolution of various antiquarian periods in History.
- Knowledge regarding connections between various Bronze Age Civilization.
- Transition from Bronze Age to Iron.
- Emergence of Nomadic groups and their migration to various part of world.
- Basic knowledge on debate on slavery and Greece civilization.

SEMESTER-II

HIS-HC-2016: HISTORY OF INDIA-II

- Knowledge about economic and socio cultural connections of early Indian History from 300BCE to 300CE.
- Basic knowledge about transition and stratifications of various dynasties of the said period.
- Knowledge regarding Varna, jati, untouchability, gender, marriage and property relations.
- Basic knowledge about brahmanical traditions, theistic cults, tantricism.
- Knowledge of various Indian literature: Sanskrit, Pali, Prakrit.

HIS-HC-2026: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD.

- Basic knowledge of world civilizations their emergence, growth and decline.
- Slave society and agrarian economy of Roman Republic.
- Knowledge regarding rise and fall of Roman Republic II.
- Economic developments in Europe from the 7^{th} to the 14^{th} centuries.
- Knowledge regarding religion and culture in medieval Europe.
- Basic knowledge of societies in Central Islamic Lands.

SEMESTER III

HIS-HC-3016: HISTORY OF INDIA III(c.750-1206)

- Basic knowledge on developments in India in its political and economic fields.
- Knowledge on sources of the said period.
- Debates on feudalism.
- Knowledge regarding evolution of political structures of Rashtrakutas, Pala, Pratiharas, Rajputs and Cholas.
- Agricultural expansion and society.
- Basic knowledge of trade and commerce and its development throughout the said period.
- Religious and cultural developments.

HIS-HC-3026: RISE OF THE MODERN WEST-I

- Basic Knowledge of major trends and development of western world between 14^{th} to 16^{th} century CE.
- Transition from feudalism to capitalism.
- Geographical exploration and early colonial expansions its factors and motives.
- Causes ,origins and impact of Renaissance
- Knowledge regarding the reformation in the 16^{th} century by Martin Luther,John Calvin, Zwingli ,Anabaptists, Huguenots.

- Counter revolution.
- Shift of economic balance from the Mediterranean to the Atlantic.

HIS-HC-3036: HISTORY OF INDIA IV (c.1206-1550)

- Political and administrative history of India
- Sources : Persian tarikh tradtion, foreign account.
- Foundation and expansion of Delhi Sultanate: Slave dynasty , Khaljis, Tughluqs, Sayyids,Lodis.
- Society and economy : Iqta system , monetization ,market regulation, growth of urban center and Indian ocean trade .
- Basic knowledge on regional polities : Bahmani , Vijayanagar , Gujarat, Malwa, Jaunpur, Assam and Bengal.
- Sufi silsilas and bhakti movement.
- Monotheistic traditions in South and North India.
- Women bhaktas , Nathpanthis and the Sant tradition.

SEMESTER:IV

HIS-HC-4016: RISE OF THE MODERN WEST-II

- Basic knowledge on political and intellectual currents in Europe in the modern age.
- Formation of state in the 17^{th} Century : Spain , France, England, Russia.
- Knowledge on English revolution: Political and intellectual.
- Development in economy in Europe during 17^{th} and 18^{th} centuries.
- Students knowledge will enhance about the parliamentary monarchy , patterns of absolutism in Europe and political and economic issues of American revolution in 18^{th} century.
- The students will also be able to relate the circumstances and casual factors of the industrial revolution , its money economy and its putting out system.

HIS-HC-4026: HISTORY OF INDIA (c.1550-1605)

- Student will get a very sound knowledge on sources and historiography like Persian literature , its translation , memoirs and travelogues .
- It gives knowledge on Vernacular literature , epigraphy and numismatics.

- After completion of this course the student will be able to know about Babur's invasion , military technology and warfare.
- The student also will be able to describe how humayun struggled for empire .
- The paper also speak about the efficient administrative system and revenue reform of Sher Shah.
- After completion of this course the student will also be able to know about Mughal rule under Akbar and his conquest and administrative system : mansabdari system, jagirdari system .
- The course will also provide vivid knowledge about the incorporation of Rajputs , North-west frontier, Gujrat, Deccan, and other indigenous groups in Mughal nobility.
- The paper also speak about land rights , revenue system , extension of agriculture.

HIS-HC-4036: HISTORY OF INDIA VI (C. 1605-1750)

- After completion of this course the student will be able to explain about political culture under Jahangir and shah jahan and their architecture and paintings etc.
- This course will also enable them to know about the Mughal empire under Aurangzab and his religious policies and conquest etc.
- This paper will also enhance student knowledge on regional politics ' rise of Marathas, development of trade commerce and decline of mughal empire.

SEMESTER-V

HIS-HC-5016: HISTORY OF MODERN EUROPE –I (c.1780-1939)

- The student will learn about the French revolution and its repercussions .
- They will also learn about revolutionary and radical movement of 1832 to 1848.
- The paper will also focus on capitalist industrialization , social-economic transformation of late 18^{th} century to c. 1914.
- This paper will also focus on varieties of nationalism(Germany and Italy) and remaking of state in 19^{th} and 20^{th} century.

HIS-HC-5026: HISTORY OF INDIA VII(c.1780-1857)

- The paper focus on expansion and consolidation of colonial power in India and their ideology: Portuguese, Dutch , English, France .
- The student will also be made aware of the rural economy and society and growth of trade and industry.

- The paper also focus on Santhal uprising and 1857 uprising.

SEMESTER VI

HIS-HC-6016: HISTORY OF INDIA VIII(c1857-1950)

- This paper will enable the students to analyse the course of British colonial exploitation ,social mobilization between c1857 to 1950.
- It will enhance student knowledge on socio religious reform movements and rise of National movement.
- It will focus on Gandhian Nationalism , Social groups ,communalism and partition of India.

HiS-HC-6026: HISTORY OF MODERN EUROPE II(circa 1780 -1939)

- The student will be able to analyse the Historical developments in Europe c.1780-1939.
- It will focus on democratic and socialist foundations of Modern Europe.
- Highlight historical development of working class movements, socialist upsurge and the economic forces of the two wars,
- Give knowledge of crisis of feudalism in Russia and experiments in Socialism.
- Basic knowledge of imperialism , war and crisis. c 1880-1919.
- Give knowledge of cultural and Intellectual Developments since circa 1850.

B.A HG and RC

HIS-RC-1016/HIS-HG1016: HISTORY OF INDIA FROM EARLIEST TIMES UPTO c.1206.

- Basic knowledge on state system in North India and South India.
- The student will be able to understand socio political and economic changes in early India.
- They will learn about Indian contacts with outside world.
- The student will learn regarding architectures of the said period.

HIS-HC-2016/HIS-RC-2016: HISTORY OF INDIA c.1206-1757.

- The student will learn to analyse the political and social development in India between 1206-1757.
- Course will provide knowledge on the formation of different states of the said period and their administrative system.
- The student also learn about the socio economic and cultural condition of India between 13^{th} to mid 18^{th} century period.

HIS-HG-3016/HIS-RC-3016:HISTORY OF INDIA fromc.1757-1947.

- The paper will provide knowledge on consolidation of british rule in India.
- It will enhance the knowledge to identify the process of growth of resistance against the British colonial rule.
- The student will learn Indian nationalist movement which lead to the end of the British rule in India.

HIS-HG-4016/HIS-RC-4016: SOCIAL AND ECONOMIC HISTORY OF ASSAM.

- The student will learn the socio economic history of Assam including the development of caste system, religious beliefs, agriculture and land system.
- The student will know regarding social organizations, trade and commerce, various agricultural regulations, Plantation economy.
- They will know about the development of modern Industries ,transport system, education system , the emergence of middle class,
- development of literature and press and the growth of public associations.

HIS-RE-5016: HISTORY OF INDIAc.1757-1947.

- The paper will provide knowledge on consolidation of british rule in India.
- It will enhance the knowledge to identify the process of growth of resistance against the British colonial rule.
- The student will learn Indian nationalist movement which lead to the end of the British rule in India.

HIS-RG-5016:HISTORY OF EUROPEc.1648-1870

- The paper equips students to understand the events that unfolded in Europe during the period and how these events were not only results of previous political, historical as well as economic and social events ,but also shaped the future of European and world history.
- The paper analyse the French revolution, the fall of monarchy,the growth of capitalism and the Industrial revolution and its relation to colonialism.

HIS-RE-6016:HISTORY OF ASSAMc.1826-1947

- The course will provide Knowledge on British rule in Assam after its annexation by the imperialist forces of the said period.
- The student will learn the development of Nationalism in Assam and its role in Indias freedom struggle.
- The learners will come to know about the main current of the socio political and economic development of the colonial period in Assam.

HIS-RG-6016: HISTORY OF EUROPEc.1870-1939.

- The learners will be able to enhance their knowledge on the major political developments in Europe from 1870-1939.
- The student will know regarding the unification of Germany and Italy.
- Rise of imperialism and its impact.
- The course will enable the students to know about the various causes and consequences of world war I and world war II.

HIS-SE-3014:HISTORICAL TOURISM IN NORTH EAST INDIA.

- The learners will be able to know about the Tourism in North East India with reference to the Historical monuments ,cultural and ecological elements and places of north east India as tourist and heritage sites of Nation.
- The learners will come to know about the growing vocation of Tourism as an industry and the applicability of Historical knowledge for its growth.

- The students will further be able to know how to engage themselves in Tourism Industry.

DEPARTMENT OF PHYSICS

BISWANATH COLLEGE

PROGRAMME OUTCOMES

PROGRAMME: B.SC. PHYSICS

Link to GU Syllabus:

1. Physics Major/General (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-physics-major-general
2. Physics Honours (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/physics
3. Physics Regular (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/physics

1. Knowledge and Understanding:

a. In Mathematical Physics, students get the opportunity to learn vectors, vector calculus, Differential Equations, Matrices, Tensor Analysis, and Complex Variables etc.

b. Students learn various facts of Electricity and Magnetism. They also learn the basics of transmission lines, principle of operation of electric motors, electric generator. A comprehensive review on Gauss's Law and its applications in determination of Electric field intensity in different electrical set up.

c. Students will gain adequate knowledge on laws of thermodynamics and its applications in Heat engine, refrigerator etc. They will also grasp the utility of second law in describing entropy of thermodynamic systems and its connection to evolution of universe.

d. Students will learn the basics of electronics, principle of operation of diodes, transistors etc. It will help in understanding the working of rectifiers used for AC-DC conversion, amplifiers etc.

e. Students get the opportunity to learn various computational techniques like C, C++, FORTRAN, and Python. They will also be made acquainted to software's like MATLAB, MATHEMATICA. However, because of time constraint it may not be possible to learn enough on every language or software's.

f. Students learn the evolution of different Atom Models discussed under Atomic Physics. The program will enable students to understand the physics of Hydrogen spectra, fine structure lines in spectroscopy and splitting of spectral lines in external fields. It has far reaching implications in understanding the composition of astrophysical objects of interest.

g. Students will learn the theories and models of Nuclear and Particle Physics. This knowledge will help in understanding the working of modern day detectors, counters.

The concept of Binding Energy will help in understanding the fundamentals of nuclear stability.

h. With the introduction of Statistical Physics, students will understand the physics of many particle systems. The knowledge on classical and quantum statistics will describe the behavior of Bose Einstein's Condensate, Fermi pressure and the behavior of white dwarf star.

i. Students will learn geometrical optics, physical optics and holography to understand various optical phenomena and will understand the designing of optical instruments.

j. The physics of bodies moving at speed comparable to light is indeed very interesting and it conceptualize the understanding on different frame of reference. The students will learn Special Theory of Relativity and its applications.

2. Development of intellectual faculties:

a. Mathematics is the language of Physics. The course will promotelogical and analytical thinking amongst students.

b. Students will eventually develop the art of relating the facts learned in different papers and this will inculcate constructive thinking and will develop problem solving capacity.

c. During the process of performing experiments, a systematic approach is required. This systematic study develops a sense of chronological approach towards a problem.

d. In performing experiments relatedto Electronics paper, students will acquire the skill of designing circuit and assembling components.

e. While learning various facts, students will develop a sense of visualization. It will help them to grasp the nature of subatomic particles and behaviour of different physical systems of interest.

f. Students will develop imaginative power and will also acquire the skill to estimate measurements or make legitimate guess in physics problems.

3.Practical Skills:

a. Students learn the basic measuring techniques of length using slide callipers, screw gauge, spherometer etc.

b. Students will get the exposure to certain experiments of electricity, thermal physics, mechanics, nuclear physics, electronics and so forth.

c. Students will learn how to handle analog and digital multimeters. They will experience the utility of different electronic instruments.

d. Students will get the opportunity to handle function generator and CRO (Cathode Ray Oscilloscope). By this process, they will learn to measure frequency, wavelength of a wave or signal.
e. Students are supposed to pursue a project on a novel topic. This fosters a sense of creativity amongst the students. Also, the students will get a basic feel of research. They will acquire some computational skill, writing skill and will develop physical insight on the problem.
f. Students will get hands-on training on the latest computational techniques like Python, Sci-Lab etc.

4. **Communication and Other Skills:**

a. Students are allowed to prepare a topic holistically and after that they are asked to present. This polishes their communication skills. In other words, the communication skill is developed.
b. While performing the project work, students are encouraged to participate in group discussion with the supervisor, other faculty members and some of the students. This will develop a confidence and art of speaking/delivery in public platform. Sometimes projects are carried out in group. By that process, they develop a team spirit, sportsmanship etc.
c. The course exposes the students to various facets of computer programming and other relevant diagnostic techniques that may have important applications in developing future technology.

5. Prospects of employment:

(a) After the successful completion of this course, a student becomes eligible to pursue higher studies such as MSc (Physics) in different reputed institution across the country.

(b)A student of BSc Physics can be absorbed as a science teacher in a school provided he/she fulfils other eligibility criteria.

(c) A student of BSc Physics may get the opportunity to pursue a course on Geophysics, Biophysics, Sound engineering and so forth.

(d) A student of BSc Physics may get employment in the fields of instrumentation, nuclear medicine, radiology etc.

(e) A student pursuing BSc in Physics may dream of getting placement as Scientists in reputed organization like ISRO, DRDO other research institutes like IUCAA, S.N. Bose institute, SINP, Kolkata after completion of Ph.D and adequate research in respective fields.

(f) Students may undertake various training after completion of BSc and may get a scope to

serve the country through civil services.

(g) Students will get ample opportunity to build a career in reputed Govt. owned enterprises like OIL, ONGC, and IOCL after completion of BSc.

(h) There are opportunities to get a placement in Central, Cooperative Banks as PO, Asst Branch Manager, and Client relationship officer after completion of BSc in Physics, which serves as eligibility criteria.

6. **Ethics**:

(a) In the process of project preparation students will be made aware of IP tools such as copyright. They will learn about plagiarism issues and will practice genuine techniques in preparing projects and other reports related to academics. This will develop an independent feel and bring out creativity amongst students.

(b)Students will understand the protocols of Laboratory work and learn discipline in performing their duties.

Head
Deptt.of Physics

Learning Objective & Outcomes

B.Sc.1st Semester

Subject:Mathematical Physics I **Subject Code:PHY-HC-1016**

Learning Objective

1. The students will be introducedto Mathematical tools needed to address any problems in Theoretical Physics
2. The course will giveknowledge about Vector Calculus, Differential Equations, Curvilinear Coordinates, and Special Functions which have proved to be vital components in understanding key concepts of Electrodynamics, Quantum Mechanics, and Statistical Mechanics.
3. The course is designed in a framework that can inculcate analytical thinking among the students.

Learning Outcomes

After the completion of the course-

1. Students will acquire adequate knowledge about Vector and its applications in various fields.
2. The course will enable the students to apply the knowledge of Differential Equations in different core papers to be learned in subsequent semesters.
3. At the end of the course, the students are expected to understand the importance of different coordinate systems i.e. Cartesian, spherical and cylindrical in studying Physics.
4. The course will enable students to pursue a career in Theoretical Physics in the future.

Learning Objective & Outcomes

B.Sc. 1st Semester
Subject: Mechanics **Subject Code:PHY-HC-1026**

Learning Objective

1. This paper deals with Newtonian mechanics and its importance in classical world.
2. The paper is introduced with the very motive to familiarize students with various conservation laws of nature, physics of astrophysical objects, rigid body dynamics, physics of materials used in daily life.
3. Above all, Special theory of Relativity is introduced to learn the importance of inertial frames, Transformation equations and physical events admissible at speed comparable to light.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Distinguish between inertial, non-inertial frames and physics associated with this reference frames.
2. Understand the Simple Harmonic Motion and the characteristics of such oscillating systems.
3. Grasp the principle of projectile motion and their applications in technological advancement.

Learning Objective & Outcomes

B.Sc. 2nd Sem.

Subject: Electricity and Magnetism **Subject code:PHY-HC-2016**

Learning Objective

This Course is designed to

1. Give detail knowledge on Electric Potential, Fields of different charge configurations. Promote comprehensive discussion on the utility of Laplace's and Poisson's Equation.
2. Develop ideas and gain knowledge on the Dielectric properties of matter and its applications.
3. Generate inquisitiveness among the students about magnetic properties of materials and its contribution in technological advancement.
4. To gain knowledge about Network theorems applicable in circuits.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

1. Understand the details of Electric and Magnetic Fields in matter.
2. Visualize the importance of Faraday's Laws of EM Induction in various applications such as transformer, ac generator etc.
3. Realize the concept of displacement current.
4. Apply knowledge of Kirchhoff's law to understand the operation of various electrical circuits used in modern devices.
5. Understand the functioning of Ballistic galvanometer.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc. 2nd Semester

Subject: Waves and Optics **Subject Code:PHY-HC-2026**

Learning Objective

1. The objective of the course is to develop understanding on the characteristics of mechanical and EM waves.
2. To introduce superposition principle and discuss wave properties like interference, diffraction.
3. To introduce Holography, its principle and applications in defense, medical industry.

Learning Outcomes

After the completion of the course, Students will be able to:

1. Understand the applications of superposition principle and will be able to see the physical origin of Beats.
2. Grasp the physics of musical instruments.
3. Gain knowledge on various Interferometers and understand EM phenomena that occur due to interference and diffraction of light.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc.3rdSemester

Subject: Mathematical Physics II **Subject Code:PHY-HC-3016**

Learning Objective

1. To teach students about the analytical functions, develop the concept of singularity, Frobenius Method, Partial Differential Equations.

2. To introduce Fourier series to the students and show the applications in square and triangular waves.

3. The course discusses the utility of Hermitian, anti Hermitian, symmetric, antisymmetric matrix which will find applications in Quantum Mechanics to be studied in the subsequent semester.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Solve second order ODE using Power series and Frobenius method.
2. Understand the utility of Legendre Polynomial, Hermite polynomial, Laguerre's polynomial and their significance in Electrodynamics, solution of Schrodinger equation.

3. Visualize the mathematical origin of complex wave pattern in signal processing.

4. Do Fourier analysis to understand the complicated periodic function.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc. 3rd Semester

Subject:T h e r m a l P h y s i c s **Subject Code:PHY-HC-3026**

Learning Objective

1. To teach the applications of 1st, 2nd Laws of Thermodynamics and introduce the thermodynamic parameters.
2. To demonstrate the working of Heat Engine, Refrigerator, Carnot cycle.
3. To introduce the concept of entropy, Second law in terms of entropy and its consequence.
4. The develop the concept of Maxwell's Thermodynamic Relations and its applications.
5. To discuss the utility of Clausius-Clapeyeron equation and description of the variation of boiling and melting point with pressure.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Understand the physics of Thermodynamic systems, their phase behavior, conversion mechanism of heat into work.
2. Grasp the concept of reversible and irreversible processes, First law in different thermodynamic processes.
3. Gain knowledge on various thermodynamic potentials and the relations between them.
4. Understand the phase diagram of thermodynamic systems and to assess the order of phase transition with the use of free energy.
5. Develop skill to identify and describe various thermodynamic variables.
6. Figure out the deviation of real gas from ideal ga

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Department of Physics

Learning Objective & Outcomes

B.Sc.3rdSemester

Subject :Digital Systems and Applications **Subject Code : PHY-HC-3036**

Learning objectives

1. The course will introduce CRO and its functioning to the students.
2. To teach the utility of active and passive components in electrical circuit.
3. It is designed to familiarize students with Integrated Circuits and its classifications.
4. The course includes topics on Boolean Algebra which will help in realizing the logic of different gates.
5. The course discusses sequential circuits, memory elements.
6. The course will also introduce Microprocessor and its utility to the students.

Learning outcomes

1. Students will be able to apply the knowledge of Boolean algebra in designing digital circuits.
2. Students will be able to analyze combinational logic circuits.
3. Students will be able to analyze and design sequential logic circuits.
4. Students will gain knowledge on different IC's and their utility in designing electrical circuits used in modern accessories.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc.4th Semester

Subject :M a t h e m a t i c a l P h y s i c s I I I **Subject Code :PHY-HC-4016**

Learning Objective

1. To teach the basics of complex algebra, analytic functions and singularity.
2. To introduce residue theorem and its applications in different physical systems.
3. To develop the concept of Fourier space and transformation of variables from real space to Fourier space.
4. The course aims at developing a concrete idea on tensor analysis among the students with the introduction to kronecker delta, Levi-Civita symbols.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Understand the Mathematical tools needed to address Special and General Theory of Relativity; learn Particle Physics in the future.
2. Apply the knowledge of Fourier and Laplace's Transforms in solving Differential Equations.
3. Grasp the utility of contra variant and co-variant tensors.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc. 4th Semester

Subject: Elements of Modern Physics **Subject code:PHY-HC-4026**

Learning Objective

This Course Enable the Students to

1. Learn the bridge connecting Classical and Quantum Physics.
2. Understand the limitations of Classical Physics with concrete discussion on Black Body radiation, Photoelectric effect and Compton scattering.
3. Grasp the concept of wave particle duality of subatomic particles and its implications, Schrodinger equation for nonrelativistic particles, energy, momentum operators in quantum world.
4. Learn the emission mechanism of alpha, beta and gamma rays from unstable nuclei, utility of semi empirical mass formula, concept of mass defect.
5. Learn about the principle of harnessing nuclear energy, thermonuclear fusion on earth and its success till date.
6. Learn about Laser Physics and its vast utility in the field of medicine, industry.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

1. Derive the Planck's Radiation Formula with the understanding of discrete exchange of energy between matter and radiation, concept of probability. This will be useful to formulate Wien's Displacement law that can help in measurement of surface temperature of stellar objects.
2. Understand the application of Quantum idea in measuring the power radiated off a stellar body.
3. Distinguish the characteristics of Quantum mechanical systems from the classical ones.
4. Acquire adequate knowledge on Binding Energy curve which can be helpful in explaining several nuclear phenomena and importance of magic number.
5. Learn the physics of He-Ne and Ruby Laser and its vast applications in the industrial and medical sectors.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc. 4th Semester

Subject:Analog Systems & Applications **Subject Code:PHY-HC-4036**

Learning Objective

1. To learn the physics of semiconductor devices, physical concept of band gap and biasing of diodes.

2. Learn the usage of Rectifiers in conversion of AC to DC, applications of Zener diode as voltage regulator.

3. The course intends to present a detail description of Transistors and its various configurations. The mechanism of current flow in active electrical components is also included.

4. The course will establish the underlying physical concept of transistor acting as an amplifier and switch.

5. To learn about OPAMP and its utility as an adder, subtractor, Differentiator in analog electronics.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Understand the working of PN junction diodes, photo diodes, zener diodes, solar cell etc. as applications of Semiconductor Physics.
2. Gain knowledge on amplifier circuit and the mechanism of feedback in such amplifiers.
3. Understand the utility of OPAMP and oscillator circuits in electronic devices.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B.Sc.(Physics) 5thSemester

Subject :Quantum Mechanics & Applications **Subject Code :PHY-HC-5016**

Learning Objective

1. To teach the students about time dependent Schrodinger Equation, energy, momentum operators, Eigen functions.
2. To help students inanalyzing the physical meaning of wave functions, the normalization and orthogonality relation concerning the wave function associated with a quantum mechanical system.
3. Students will be taught about time independent Schrodinger equation, wave packets and linear combination of stationary states.
4. To teach the application of Schrodinger equation in Hydrogen like atoms and simple harmonic oscillator.
5. To course intends to provide a detail description on the key concepts of atomic physics such as vector atom model, spectroscopic property of multi electronic atoms and their behavior in electric and magnetic fields.

LearningOutcomes

After the completion of the course, Students will be ableto

1. Understand the fundamentals of Quantum Mechanics and the developed framework to understand the behavior of atoms and subatomic particles.
2. Grasp the concept of free particle, stationary and non-stationary states, the method for solving Schrodinger equation in time dependent and time independent situations.
3. Learn the concept of spatial quantization, spinning electron hypothesis and its applications in spectroscopy.
4. Learn about the physical origin of fine structure lines, its intensity and various selection rules of Quantum mechanical origin.
5. Analyze the splitting of spectral lines in electric and magnetic fields : Stark and Zeeman effect.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B. Sc. 5th Semester

Subject:Solid State Physics **Subject Code: PHY-HC-5026**

Learning objectives

1. To introduce crystalline solids, concept of unit cell, miller indices, reciprocal lattice and Bravais lattice to the students.
2. To teach X ray diffraction : Bragg's law as an experimental diagnostic for analysis of crystal structure.
3. To highlight the importance of specific heat and present a detail description of specific heat for solids: Dulong'sPetit's law, Debye-Einstein theory.
4. To discuss about the magnetic properties of solids, Spontaneous magnetization, Curie's law, Hysteresis and energy loss.
5. The course is designed to teach students about dielectric properties of materials, dispersion relation of normal modes.
6. To teach the students about Free Electron theory, Weidman Franz law and the band theory for distinguishing conductors, semiconductors and insulators.
7. To introduce Superconductivity, Meissner effect and the applications.

Learningoutcomes

1. Students will learn about various types of crystalline solids, their packing fraction, interatomic force and hardness and softness of solids.
2. Students will learn about the behavior of specific heat of solids at low temperature.
3. Students will understand the relation between thermal and electrical conductivity of solids.
4. The course will enable students to learn about cooper pairing and its consequence, critical temperature and critical magnetic field and its significance.
5. Students will also learn about Hall effect and its applications in detecting P type, N type SCs and in measuring conductivity.

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective & Outcomes

B. Sc. 5th Semester

Subject: Advanced Mathematical Physics I **Subject Code:** **PHY-HE-5036**

Learning objectives

1. To teach the students about Linear independence and dependence of a vector.
2. To teach about Eigen values, Eigen vectors and rotations in 3D in matrix algebra.
3. Students will be introduced to Minkowski space, symmetric and anti-symmetric tensor and metric tensor.

Learning outcomes

Upon Completion of the course students will be able to-

1. Grasp knowledge on matrix algebra, Linear Vector Space and Tensor.
2. Deal with the advanced mathematical tools to address problems in theoretical physics.

Learning Objective & Outcomes

B. Sc. 6th Semester

Subject: Electromagnetic Theory **Subject Code:** PHY-HC-6016

Learning objectives

1. To review the Maxwell's Equations, furnish a detail discussion on Lorentz and Coulomb gauge transformation equations, propagation of EM wave through vacuum, dielectric and conducting medium.
2. To make the students acquainted with reflection and refraction of plane waves at the interface, Fresnel's Formula, Polarization and Brewster's law.
3. To give idea on numerical aperture, single and multiple mode fibers.

Learning outcomes

Upon Completion of the course students will be able to-

1. Evaluate EM energy density and quantify rate of energy flow through a surface.
2. Gain knowledge on Poynting Vector,formulate energy conservation principle in the light of Poynting Theorem.
3. Students will understand the propagation of EM waves in homogenous isotropic media.
4. Learn about the boundary conditions operative at the interface. Determination of Reflection, Transmission coefficients and Fresnel's formula.

Biswanath College, BiswanathChariali

Department of Physics

Subject: Statistical Mechanics **Subject Code:** PHY-HC-6026

Learning objectives

1. To introduce the concept of macro state, microstate, develop idea on configuration/phase space.
2. To avail a detail discussion on different types of ensemble admissible in real physical systems.
3. To acquaint students with the characteristics of thermal radiation. Classical description of radiation with the formulation of Wien's law, Rayleigh-Jeans law.
4. To provide adequate knowledge on Quantum theory of radiation, describe Planck's radiation formula and its implications.
5. To discuss in detail Classical and Quantum Statistics and description of many body systems in the light of Distribution law formulated for MB, BE and FD statistics.

Learning Outcome

Upon Completion of the course students will be able to-

1. Understand the application of Statistical Mechanics in addressing various problems of Astrophysics, Plasma Physics also in Chemistry and Life sciences.
2. Describe the behavior of many body systems such as a container filled with gas or a metallic sample with millions of electrons.It can be accomplished with the utility of the Classical and Quantum Statistics.
3. Utilize Wien's Displacement law for measurement of surface temperature of celestial objects, Stefan's law for measurement of radiated power from an object.
4. Grasp the failure of Classical Rayleigh Jean's and Wien's law in describing the Black Body radiation. Understand the concept of Ultra violet Catastrophe.

Course Outcome of Non CBCS Course (Current semesters in practice)

Subject: Mathematical Methods and Classical Mechanics **Subject Code:** PHY-M-5.1

Learning objectives

1. To teach Complex variable with detail discussion on Argand diagram, Euler's formula and De Moivre's Theorem.
2. To discuss analytic functions, Contour integrals and Cauchy Integral Theorem.
3. To develop idea on Residues, zeros and utility of Residue theorem.
4. To discuss motion of objects in central force fields, conservation laws as an outcone of Newtonian mechanics, Constraints.
5. The course will provide discussion on Lagrange's equation and its advantage over Newton's equation of motion.
6. The course also includes application of Lagrange's equation in describing the dynamics of simple pendulum, Atwood's machine, Keplerian motion etc.

7. To provide adequate knowledge on Hamilton's principle and its utility. Applications of Hamilton's formulation to understand the behavior of Oscillating systems, Kepler's problem.

Learning Outcome

Upon Completion of the course students will be able to-

1. Use the knowledge of Complex algebra to solve problems in real physical systems and conduct Fourier space analysis.
2. Understand the dynamics of Planet-Star system in the light of Kepler's law.
3. Determine the nature of orbits in Central force motion.
4. Learn Calculus of variation and its use in the discussion of Hamilton's variational principle.

Subject: Atomic Physics **Subject Code:** PHY-M-5.2

Learning objectives

1. To give a detail idea on Bohr's atomic Model, Determination of total energy of electron, radius of electronic orbit. Drawbacks of the model.
2. To discuss fine structure of spectral lines in the light of Sommerfeld's model.
3. To present a detail description on Vector Atom Model, Concept of Spatial quantization and spinning electron hypothesis.
4. To elucidate the physical mechanism underlying Zeeman Effect, Stark Effect and Pashen Back Effect.
5. To discuss in detail continuous and characteristic x rays and its production.
6. To discuss Raman Effect and its applications.

Learning Outcomes

Upon Completion of the course students will be able to-

1. Understand the Quantization of angular momentum, stationary orbits. Develop enough idea on Bohr's Atomic model.
2. Grasp the utility of X ray and its applications.
3. Understand Rutherford's Atomic model, scattering of particles off a heavy target.

Subject: Quantum Mechanics and Astrophysics **Subject Code:** PHY-M-5.3

Biswanath College, BiswanathChariali

Department of Physics

Learning Objective

1. To teach the students about time dependent Schrodinger Equation, energy, momentum operators, Eigen functions.

2. To help students in analyzing the physical meaning of wave functions, the normalization and orthogonality relation concerning the wave function associated with a quantum mechanical system.

3. Students will be taught about time independent Schrodinger equation, wave packets and linear combination of stationary states.

4. To teach the application of Schrodinger equation in one Dimensional potential barrier, 1D Harmonic Oscillator.

5. To course intends to provide a detail description on development of Quantum Mechanics, failure of Classical idea. Description of BlackBody Radiation and Planck's Quantum Hypothesis.

6. To develop idea on Celestial coordinates, stellar magnitude system and spectroscopic Parallax to measure distance in astrophysical scenario.

LearningOutcomes

After the completion of the course, Students will be ableto-

1. Understand the fundamentals of Quantum Mechanics and the developed framework to understand the behavior of atoms and subatomic particles.
2. Grasp the concept of free particle, stationary and non-stationary states, the method for solving Schrodinger equation in time dependent and time independent situations.
3. Visualize the importance of Quantum tunneling in devices.
4. Grasp the knowledge of stellar magnitude and distance measurement system.
5. Understand the spectral classification and Stellar Evolution.

Biswanath College, BiswanathChariali

Department of Physics

Subject: Electronics **Subject Code:** PHY-M-5.4

Learning objectives

1. To discuss the working of PN junction diode, Half and Full wave rectifier, development of regulated power supply.
2. Introduce Network theorems with examples.
3. Introduce Transistor, CB, CE mode of operation.
4. Discuss Transistor action, transistor as an amplifier.
5. Understand the Feedback mechanism and working principle of oscillators.
6. Introduction to Logic gates, Binary Number system and Flip Flops.

Learning outcomes

After the completion of the course, Students will be ableto-

1. Understand the working of SC diode.
2. Grasp the use of transistor in signal amplification and switching action.
3. Understand the functioning of memory element i.e. Flip Flops and will classify the types of Flip-flop available.

Subject: Nuclear Physics **Subject Code:** PHY-M-6.1

Learning objectives

1. To develop idea on nuclear force and stability of various nuclei.
2. To provide an outline on Yukawa Meson Theory.
3. To introduce radioactive decay process in Nuclear Physics. Understanding on alpha, beta and gamma radiation.
4. To learn about nuclear reactions, accelerators, construction and working of cyclotron.

Learning outcomes

After the completion of the course, Students will be ableto-

1. Understand the concept of binding energy, mass defect and stability of nuclei.
2. Learn the detail of nuclear fission, chain reaction.
3. Learn the fundamental concept of nuclear fusion, fusion barrier and challenges ahead.
4. Gain knowledge on cosmic rays and physical mechanism involving extensive air

shower.

Subject: Mathematical Methods and Solid State Physics **Subject Code:** PHY-M-6.2

Learning objectives

1. Understand Tensor analysis, contra variant and covariant tensors, rules for combination of tensors.
2. To introduce crystalline solids, concept of unit cell, miller indices, reciprocal lattice and Bravais lattice to the students.
3. To teach X ray diffraction: Bragg's law as an experimental diagnostic for analysis of crystal structure.
4. To teach the students about Free Electron theory, Weidman Franz law and the band theory for distinguishing conductors, semiconductors and insulators.

Learning outcomes

After the completion of the course, Students will be ableto-

1. Grasp idea on use of tensor in different fields.
2. Understand the magnetic properties of solids, energy loss in hysteresis.
3. Gain introductory idea on superconductivity, Meissner effect. Applications of superconductors in MRI, NMR and tokamak.

Subject: Modern Optics&EM Theory**Subject Code:** PHY-M-6.3

Learning objectives

1. To teach interference of polarized light, Babinet compensator.
2. To provide adequate knowledge on the principle of Holography, idea about optical fibers.
3. To review the Maxwell's Equations, furnish a detail discussion on Lorentz and Coulomb gauge transformation equations, propagation of EM wave through vacuum,

dielectric and conducting medium.
4. To make the students acquainted with reflection and refraction of plane waves at the interface, Fresnel's Formula, Polarization and Brewster's law.

Learning outcomes

After the completion of the course, Students will be ableto-

1. To introduce polarization, Brewster's Law.
2. Evaluate EM energy density and quantify rate of energy flow through a surface.
3. Gain knowledge on PoyntingVector, formulate energy conservation principle in the light of Poynting Theorem.
4. Students will understand the propagation of EM waves in homogenous isotropic media.

Subject: Statistical Mechanics **Subject Code:** PHY-M-6.4

Learning objectives

1. To introduce the concept of macro state, microstate, develop idea on configuration/phase space.
2. To avail a detail discussion on different types of ensemble admissible in real physical systems.
3. To discuss in detail Classical and Quantum Statistics and description of many body systems in the light of Distribution law formulated for MB, BE and FD statistics.
4. Application of Maxwell velocity Distribution Law, application of FD to discuss electronic specific heat.

Learning Outcome

Upon Completion of the course students will be able to-

1. Understand the application of Statistical Mechanics in addressing various problems of Astrophysics, Plasma Physics also in Chemistry and Life sciences.
2. Describe the behavior of many body systems such as a container filled with gas or a metallic sample with millions of electrons. It can be accomplished with the utility of the Classical and Quantum Statistics.
3. Utilize BE distribution function to determine Planck's Radiation Formula.
4. Grasp idea on BE condensation.

UNDERGRADUATE COURSE STRUCTURE IN POLITICAL SCIENCE

DEPARTMENT OF POLITICAL SCIENCE, BISWANATH COLLEGE

Being an affiliating college of Gauhati university, Biswanath College has to follow the Course curriculum of the parent university. Though the College follows the course specific outcomes of the university, however the college imparts some more outcomes to the Honours and Regular Courses. The following is the course structure and syllabus for Non-CBCS BA (Major) in Political Science.

PROGRAMMES OUTCOMES

Programme: BA Political Science

1. Knowledge and understanding:

a. Understanding the political behavior, governance, political system and various institutions in the worlds.
b. Comparative study of different political system such as United Kingdom, United States, China, Switzerland, Brazil, Nizeria etc.
c. Understanding the political theories.
d. Knowledge of national and international politics.
e .Understanding the processes and dynamics of Indian government and politics.

2. Intellectual skills:

a. Searching various burning issues related to society and politics through internet, newspaper, journal and local magazine etc
b. Logical interpretation/explanations of problems related to political science.

3. Practical Skills:

a. Study of local politics including caste politics, regional politics, and communal politics and its impact on national integration.
b. Study of global politics and environmental degradation.
c. Socio-economic and political impact of human rights violation issues especially vulnerable sections of the society.
d. Study of state security, international relation and peace.

4. Transferable Skills:

a. Access to E library resources.
b. Use of information technology for gathering and sharing of data.

5. Scientific knowledge and Problem analysis-

a. Collection of various datas, conduction of field survey with an aim to solve various socio-political problems through objective methodology.

6. Ethics:-

a. To aware students with knowledge about local, national and global politics
b. To provide practical knowledge about administrative affairs and bureaucratic system.
c. Basic knowledge on constitutional rights and duties.
d. To broaden understanding on existing political theories and concepts like democracy, power, authority and state etc.

COURSE SPECIFIC OUTCOMES (BA-NON CBCS)

FIRST SEMESTER

Paper 1 POLITICAL THEORY-1

- To make students understand about basic concepts and theories of politics.
- The students will be able to know the growth of political theories, different approaches to political theories.
- To analyze the role of power and ideology in understanding the political theories better.

Paper 2 POLITICS IN INDIA – I

- To make students able to understand about the constitutional developments of India.
- To describe the basic features of Indian Constitution.
- To explore the political structure of India which are enumerated in the Indian Constitution.

SECOND SEMESTER

Paper 1 POLITICAL THEORY II

- To provide an understanding of contemporary political theories.
- To analyze the ideas and practices related to the theory of Democracy.
- Clear understanding of students on discourses of development and various models associated with it.

Paper 2 POLITICS IN INDIA – II

- To study the federal structure of India explaining the centre-state Relations.
- To make students understand about multi party system in India.
- To understand the challenges like terrorism, regionalism, casteism etc on the integrity of the country.

THIRD SEMESTER

Paper- 1 INTERNATIONAL RELATIONS-I

- To describe the discipline of International Relations.
- To understand the basic concepts and approaches of International Relations.
- To analyze the impacts of various historical events such as World War I, World War II and Cold war.

Paper 2 PUBLIC ADMINISTRATION-I

- To introduce the concepts of Public Administration.
- To analyze the theories of Public Administration like scientific Management, Bureaucratic Theory etc.
- To understand the principles and structures of Organization.

FOURTH SEMESTER

Paper 1 INTERNATIONAL RELATIONS- II

- To discuss the concepts like Foreign policy and diplomacy Conflict resolution, Non-alignment.
- To analyze the role of United Nations, its formation.
- To discuss the political economy of the world with the analysis of WTO, World Bank etc..

Paper 2 PUBLIC ADMINISTRATION-II

- To discuss the working of personnel administration and financial Administration, budgetary process.
- To understand the growing importance of Development Administration, contribution of F.W. Riggs in the Third world Countries.
- To analyze the citizen's participation in administration process.

FIFTH SEMESTER

Paper 1 WESTERN POLITICAL THINKERS

- To discuss the political thoughts of ancient and medieval political thinkers.
- To discuss the political thoughts of the Contractualists such as Hobbes, Locke and Rousseau.
- To analyze the Marxian Political Thought and its relevance.

Paper 2 SELECT CONSTITUTIONS-I

- To discuss the constitution and political process of the United Kingdom.
- To discuss the constitution and political process of the United States of America.
- To make a comparative study between the United Kingdom and the United States of America.

Paper 3B GENERAL SOCIOLOGY – I

- To understand the meaning, growth and methods of Sociology as a social science discipline.
- To understand the role of family, society and community and to analyze the caste, class and gender as social stratification.

Paper 4A CONTEMPORARY POLITICAL ISSUES

- To understand the importance of environmental issues and the United Nation's initiatives to resolve those.
- To understand the concept of Terrorism with special emphasis on North-east India.
- To discuss the emerging concepts of Human Development, Human security and Gender in world politics.

Paper 5A RURAL LOCAL GOVERNANCE

- To understand the growth of Rural Local Governance from ancient to post-independent India.

- To discuss the constitutional provisions pertaining to 73rd constitutional amendments.
- To analyze the structural growth and supervision of activities of Local governance in India.

Paper 6B HUMAN RIGHTS

- To introduce the concept of Human Rights and different approaches to study human rights.
- To discuss the role of United Nations in promoting Human Rights.
- To understand the role of Non-Governmental Organizations in the protection and promotion of Human Rights.

SIXTH SEMESTER

Paper1 INDIAN POLITICAL THINKERS

- This course is designed to make students understand about the political thoughts of various, reformist, Nationalist, revolutionary thinkers of India such as Manu and Kautilya, Raja Ram Mohan Roy, M.N.Roy and Gandhi, Nehru, Ambedkar and Narayan etc.

Paper 2 SELECT CONSTITUTIONS-II

- To discuss the constitution and political process of the Peoples Republic of China.
- To discuss the constitution and political process of Switzerland.
- To make a comparative study between the Peoples Republic of China and Switzerland.

Paper 3D GENERAL SOCIOLOGY – II

- This course makes students understand about various processes involved in social progress such as Culture, social control, social change, and socialization etc.

Paper 4C CONTEMPORARY POLITICAL IDEOLOGIES

- To understand the Neo-liberal ideology in Contemporary politics.
- To examine the ideology of Feminism as a contemporary ideology.
- To discuss the impacts of religious fundamentalism and multi-culturalism in contemporary politics.

Paper 5C URBAN LOCAL GOVERNANCE

- To understand the growth of Urban Local Governance from ancient to post-independent India.
- To discuss the constitutional provisions pertaining to 74^{th} constitutional amendments.
- To analyze the structural growth and supervision of activities of Urban governance in India.

Paper 6D HUMAN RIGHTS IN INDIA

- To understand Origin and Development of Human Rights in India.
- To discuss Institutional Mechanisms for Protection of Human Rights.

- To discuss the emerging issues of Human rights such as Terrorism, environmental issues and so on.
- To understand the human rights issues of various vulnerable groups of the society.

COURSE OUTCOMES OF BA POLITICAL SCIENCE (CBCS)

POL HC 1016 Understanding Political Theory

Course Objective: This course is divided into two sections. Section A introduces the students to the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.

POL HC 1026 Constitutional Government and Democracy in India

Course objective: This course acquaints students with the constitutional design of state structures and institutions, and their actual working overtime. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

POL HC 2016 Political Theory-Concepts and Debates

Course Objective: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation ofsocial practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.

POL HC 2026 Political Process in India

Course objective: Actual politics in India diverges quite significantly from constitutional Legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of ‘modern’ institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

POL HC 3016 Introduction to Comparative Government and Politics

Course objective: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

POL HC 3026 PERSPECTIVES ON PUBLIC ADMINISTRATION

Objective: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

POL HC 3036 Perspectives on International Relations and World History

Course Objective: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Euro -centricism of International Relations by highlighting certain specific perspectives from the Global South.

POL HC 4016 Political Processes and Institutions in Comparative Perspective

Course objective: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we

study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

POL HC 4026 PUBLIC POLICY AND ADMINISTRATION IN INDIA

Objective: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

POL HC 4036 Global Politics

Course objective: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within then globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans-national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.

POL HC 5016 Classical Political Philosophy

Course objective: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude

inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.

POL HC 5026 Indian Political Thought-I

Course objective: This course introduces the specific elements of Indian Political Thought spanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.

POL HC 6016 Modern Political Philosophy

Course objective**:** Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

POL HC 6026 Indian Political Thought-II

Course objective: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.

B) Generic Elective (Interdisciplinary): Any 4

POL HE 1016 POLITICS IN NORTH-EAST INDIA

Course Objective: The aim of this course is to explore the political history of Assam and North-East India. It discusses the colonial legacies of political system in the region. The course also looks into the recent political developments in the region specifically in Assam.

POL HE 2026 LOCAL GOVERNANCE (RURAL AND URBAN)

Course objective: This course tries to make students aware about the democratic decentralization process of India. It traces the development of Local and urban local governance from ancient to post-independent India. The course aims to discuss the provisions of 73rd and 74th constitutional amendments of the Indian constitution. After studying this paper students will be able to understand the structure and functions of the rural and urban governing bodies and their role in rural development.

POL HE 2016 Feminism: Theory and Practice

Course Objective: The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and

an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. Part II of the paper covers history of feminism in the west, socialist societies and in anti-colonial struggles. Part III focuses a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

POL HE 3016 Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

POL HE 4016 Understanding Ambedkar

Course objective: This course is broadly intended to introduce Ambedkar's ideas and their relevance in contemporary India, by looking beyond caste. Ambedkar's philosophical contributions towards Indian economy and class question, sociological interpretations on religion, gender, caste and cultural issues; ideas on politics such as concepts of nation, state, democracy, law and constitutionalism are to be pedagogically interrogated and interpreted. This will help students to critically engage themselves with the existing social concerns, state and economic structures and other institutional mechanisms. This also will facilitate them to strengthen their creative thinking with a collective approach to understand ongoing social, political, cultural and economic phenomena of the society.

POL HE 1026 GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalising world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

POL HE 4026 Politics of Globalization

Course objective: The objective of this generic elective paper is to make students from diverse background understand the process of globalization from a political perspective. This paper will create a broad understanding of the issues and processes globalization based on critical analysis of the various anchors and dimensions of globalization.

POL HE 3026 UNITED NATIONS AND GLOBAL CONFLICTS

Course Objective: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

(C) DISCIPLINE SPECIFIC ELECTIVE (Any Two)

POL HD 5016 HUMAN RIGHTS

The course objective is to introduce the concept of Human Rights and different approaches to study human rights. It aims to discuss the role of United Nations in promoting Human Rights. The course tries to understand the role of Non-Governmental Organizations in the protection and promotion of Human Rights.

POL HD 6046 Social Movements in North-east India

Course Objective: The course introduces the meaning and nature of Social movements in India. It analyzes the identity movements and the movements for autonomy which are undergoing in the region. The course also emphasizes on the newly emerging environmental, civil and women movements in the region.

POL HD 5046 Select Constitutions

Course Objective: The course introduces the constitutional and political systems of four countries. Students will have a stronger and more informed perspective on approaches to studying the constitutional and political systems of these countries in a comparative manner.

POL HD 5026 Public Policy in India

Course Objective: This course provides a theoretical and practical understanding of the concepts and methods that can be employed in the analysis of public policy. It uses the methods of political economy to understand policy as well as understand politics as it is shaped by economic changes. The course will be useful for students who seek an integrative link to their understanding of political science, economic theory and the practical world of development and social change.

POL HD 5036 Understanding Global Politics

Course Objectives: This course aims to provide students a basic yet interesting and insightful way of knowing and thinking about the world around them. It is centered on three sets of basic questions starting with what makes the world what it is by instructing students how they can conceptualize the world and their place within it. The second module focuses on the basic fault lines that drives the world apart and the last one is designed to help students explore how and why they need to think about the ‘world' as a whole from alternate vantage points.

POL HD 6016 India’s Foreign Policy in a globalizing world

Course objective: This course’s objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India’s foreign policy. The

endeavour is to highlight integral linkages between the ‘domestic’ and the ‘international’ aspects of India’s foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India’s shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an ‘aspiring power’. India’s evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international climate change negotiations, international economic governance, international terrorism and the United Nations facilitate an understanding of the changing positions and development of India’s role as a global player since independence.

POL HD 6036 Women, Power and Politics

Course objective: This course opens up the question of women’s agency, taking it beyond ‘women’s empowerment’ and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook. The course is divided into broad units, each of which is divided into three sub-units.

POL HD 6026 Understanding South Asia

Course Objective: The course introduces the historical legacies and geopolitics of South Asia as a region. It imparts an understanding of political regime types as well as the socioeconomic issues of the region in a comparative framework. The course also apprises students of the common challenges and the strategies deployed to deal with them by countries in South Asia.

(D) ABILITY ENHANCEMENT- (SKILL BASED)

POL AE 3014 PARLIAMENTARY PROCEDURES AND PRACTICES

Course Objective: The course attempts to make the students familiar with legislative practices in India with an orientation to equip them with the adequate skills of participation in deliberative processes and democratic decision making. The introductory unit of the course aims to provide basic understanding on the constitutional provisions related to the process of legislations as well as the kinds of bills. The second unit of this course seeks to enhance proper understanding related to the procedures, practices related to the passage of a bill from drafting to that of the passing of the Bill. Third unit is about different Committees in the House, and the Fourth unit is on hours and motions in the House.

POL AE 3024 YOUTH AND NATION-BUILDING

Course objectives: The aim of this course is to highlight the importance of NCC and NSS. The students will be able to get involved with the NCC and the NSS and learn about its activities and undertake tasks under its aegis. The students will also be able to learn about the basics of disaster preparedness and its management.

DEPARTMENTOFZOOLOGY
BISWANATH COLLEGE

PROGRAMME OUTCOME:

PROGRAMME: B.Sc. Zoology
Link to the GU Syllabus:

1. Zoology Honours (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/honours/zoology
2. Zoology Regular (CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/z
3. Zoology Major (Non-CBCS): https://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-zoology-mjor
4. Zoology General (Non-CBCShttps://sites.google.com/a/gauhati.ac.in/syllabus-ug-old/undergraduate-courses/tdc-in-zoology-general

Graduates of the program should be able to:

A. Disciplinary Knowledge:

1. Deliver excellent explanation about the complex hierarchy of different phyla, their distribution and their relationship with the environment.
2. Describe the structural and functional properties of cell and metabolic activities associated with proper functioning of the organism.
3. Discuss complex evolutionary processes and correlate it to the anatomy, physiology and behavior of animals.
4. Describe multiple areas within Zoology such as cell biology, genetics, taxonomy, physiology, applied zoology, general embryology and public health.
5. Explain diverse commercial aspect of zoology such as agro based small scale industries like sericulture, aquaculture, and apiculture and vermicompost preparation.
6. Understand and commute the importance of environmental conservation processes and its importance, pollution control and biodiversity and protection of endangered species.

B. Laboratory Skill

1. Understand good laboratory practices and biosafety.
2. Know and classify chemical by their nature.
3. Basics on laboratory techniques on staining and biochemical analysis.
4. Proper knowledge on handling and operation of complex laboratory instrument with proper practice manual.

C. Practical Skill

1. Animal classification and identification.
2. Basic knowledge on animal diversity survey methods and instrumentation-GPS and binoculars, needed during survey.
3. Thorough knowledge on histological studies.

D. Critical Thinking and Problem Solving

Effectively communicate biological problems and solutions to both the scientific community and public at large in writing and discussion, by using basic principles of zoology, designing and running appropriate experiment on observational studies and analysis.

E. Soft Skills

1. Develop a professional foundation through activities such as internship, participation in organization, high tech laboratory visit and also field work.
2. Good oral and written communication abilities.
3. Ability to work independently or with team member.

F. Digitally Literate

1. Basic knowledge on ICT hardware and software for use in data analysis, interpretation, storing anddistribution.
2. Knowing on databases for extraction of e-resources.

G. HigherEducation,EntrepreneurshipandEmployability

1. The graduates will be able to persue higher education- M.Sc/Integrated Ph.D or even look up for job oriented professional course.
2. Acquire skill and necessary training to initiate start up in the realm of Zoology.
3. The skills so obtained will maximize the employment probability of the graduates in both course oriented and other professional public sector job like Civil Services.

H. Ethics:

Knowledge and understanding on legal restrictions and ethical considerations placed on animal welfare.

DEPARTMENTOFZOOLOGY

BISWANATH COLLEGE

COURSE SPECIFICOUTCOME:

Biswanath College being affiliated to Gauhati University follows the course curriculum as designed by the university. The course specific outcome for the department of Zoology hence expected from the provided course curriculum has been summarized below:

B.Sc. Honors (CBCS)

1. **Semester I:**

Code: ZOO-HC-1016: Non-chordates I: Protists to Pseudocoelomates

- Students will be able to understand the fundamental principles of systematic in which the Protist, Porifera, Cnidaria, Ctenophora, Platyhelminthes and Nemathalminthes are classified according to their characters uptoclass.
- Life cycle and pathogenicity of *Plasmodium vivax* , *Entamoeba histolytica, Fasciola hepatica, Taenia solium, Ascaris lumbricoides* and *Wuchereri abancrofti* are studied here.
- Students will also gain knowledge on origin, evolution and significance of parasitism, specialized organs, symmetry and segmentation of non-chordates.

Code: ZOO-HC-1026: Principles of Ecology.

- Students will be able to learn in details about population ecology, community ecology andecosystem ecology.
- The students will be able to link the intricacies of food chains, food webs, nutrient cycle andflow of energy through the ecosystem.
- This course will enable the students to comprehend and analyze ecological parameters by using Lotka-Volterra equation, Shannon-Weiner index, Winkler's method, fecundity tables, survivorship curve and soon.
- The learner will also be understands and appreciates the diversity of ecosystems and its role andsignificance in Wildlife Conservation and Management.
- The inclusion of National Park/Biodiversity Park/ Wild Life Sanctuary visit in the course willexpose the students to new ideas and enhance their experimental, participative and life skill.

2. **Semester II:**

Code: ZOO-HC-2016: Non-chordates II: Coelomates

- Students will be able to understand the fundamental principles of systematic in which the Coelomates, Annelida, Arthropoda, Onychophora, Mollusca and Echinodermata are classified according to their characters upto class.
- They will be introduced to the concept of metamorphosis in insects, respiration in Arthropoda, torsion and detorsion in gastropods, pearl formation in Mollusca and life cycles showing the intricate social structure in this invertebrates.
- The practical included in the course will enable the students to identify the specimens of the above mentioned phylum and also it's evolutionary significance.

Code: ZOO-HC-2026: Cell Biology

- The learners will understands and be able to compares and differentiate between the prokaryotic and eukaryotic system.
- The students will be able understand the structures, cellular mechanisms and functioning of basic components of prokaryotic and eukaryotic cell component- particularly plasma membrane, endomembrane system, mitochondria, peroxisomes, cytoskeleton and nucleus.
- Acquire the detailed knowledge of different pathways related to cell signaling and mechanism of cell division – mitosis and meiosis.
- The practical included in the course will enable the students to visualize chromosome behavior during cell division in onion root tip and grasshopper testis.
- The students will learn to demonstrate the presence of barr body, mucopolysacchradies and protein by using appropriate stain/reaction in preparing permanent slide.

3. **Semester III:**

Code: ZOO-HC-3016: Chordata

- The students will be able to describe the origin of chordates and also general taxonomic rules on classification of chordate and protochordata.
- Students will be able to understand the fundamental principles of systematic in which the Agnatha, Pisces, Amphibia, Reptilia, Aves and Mammals are classified according to their characters up to class.

- Students will be familiarized with biting mechanism of snake, parental care in different animals, flight adaptation in birds and also adaptive radiation in mammals.

- Zoogeography included in the course will enable the students to understand the pattern of distribution of animal with the help of pertaining theories – Plate tectonic and Continental Drift Theory.

- The practical included in the course will enable the students to identify the specimens of the different class and also it's evolutionary significance.

Code: ZOO-HC-3026: Animal Physiology: Controlling and Coordinating Systems

- Students will be taught about different types of tissue and also detailed structure and function of certain components such as bone, cartilage, nervous tissue and muscle.

- The students will be introduced to the terminologies and working mechanism relating to various organs systems in animal physiology- Nervous system, Muscle, Reproductive System and Endocrine System.

- Detailed histological structures of organs of reproductive system- testis, ovary; endocrine system- hypothalamus, pituitary, pancreas, adrenal, and thyroid so on and also nerve cells of nervous system are included in the course.

- The students will be able to understand how this system interacts with each other and ultimately control and coordinate the functioning and well-being of the organism.

Code: ZOO-HC-3036: Fundamentals of Biochemistry

- Students will understand the basis and fundamental biochemistry of carbohydrate, lipids, protein and nucleic acids.

- They will also be able to understand the nature, mechanism and kinetics of enzyme action.

- The practical included in the course will enable the students to demonstrate qualitatively the presence of functional groups in carbohydrates, proteins and lipids and also working principle of salivary amylase.

- Students will learn separation techniques of amino acid and protein by paper chromatography and SDS-PAGE.

4. **Semester IV:**

Code: ZOO-HC-4016: Comparative Anatomy of Vertebrate

- The student will understand in detail about the Integumentary system, skeletal system, Digestive system, Respiratory system, circulatory system, nervous system and sensory system.
- They will be able to compare and differentiate the above mentioned systems in different vertebrate group.
- The practical included in the course will enable the students to practically visualize and demonstrate different types of scales in fish, carapace and plastron in tortoise and also mammalian skull.

Code: ZOO-HC-4026: Animal Physiology: Life Sustaining Systems

- Students will know the physiology of Digestion, Respiration, Renal physiology, Blood and Physiology of Heart.
- Students will gain in depth knowledge on functioning and intricate relationship between each of this system and also disorder associated with the failure of any of this system.
- The practical will enable the student to demonstrate and determine the ABO blood group, estimation of RBC, WBC and Haemoglobin and also preparation of haemin crystal.
- Students will also be able to learn the recording of blood pressure using sphygmomanometer.

Code: ZOO-HC-4026: Animal Physiology: Life Sustaining Systems

- Student will understand basic about metabolism of carbohydrate, lipid and protein.
- They will gain knowledge on how the metabolism of above mentioned macromolecules leads to synthesis of energy (ATP) and the role of Mitochondrial Respiratory Chain in ATP Synthesis.
- The students will learn how to estimate macromolecules quantitatively using various method

5. **Semester III:**

Code: ZOO-SE-3014: Ornamental Fish and Fisheries

- Students will learn about the diversity of fish in North East India.

- They will learn in details about aquarium construction and about all basic necessities of required in an aquarium.
- They will also be able to identify the ornamental fish and their management.

6. **Semester IV:**
   Code: ZOO-SE-4014: Non- Mulberry Sericulture

- Students will learn about the history and present status of mulberry and non-mulberry sericulture.
- They will also be able learn about the life cycles, rearing, pest management and entrepreneurship in non-mulberry sericulture.

B.Sc. General (CBCS)

1. **Semester I (General):**
   Code: ZOO-HG-1016: Animal Diversity

- Students will be able to understand the fundamental principles of systematic in which the Protist, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nemathalminthes, Arthropoda, Mollusca, Echinodermata, Protochordates, Agnatha, Pisces, Anphibia, Reptiles, Aves and Mammals are classified according to their characters up to class.
- They will also be learning about life cycle, parental and specialized organs systems in this organism.
- The students will also be able to identify specimens belonging to different class and phylum.

2. **Semester II (General):**
   Code: ZOO-HG-2016: Comparative Anatomy and Development Biology of Vertebrates

- The student will understand in detail and compare the integumentary system, skeletal system, digestive system, respiratory system, circulatory system, nervous system and sensory system of different groups of vertebrate.

- Students will learn the different aspects of early, late and post embryonic developments and its control.

3. Semester III (General):

Code: ZOO-HG-3016: Physiology and Biochemistry

- The students will be introduced to the terminologies and working mechanism relating to various organs systems in animal physiology- Nervous system, Muscle, Reproductive System and Endocrine System.
- Students will understand the basis and fundamental biochemistry of carbohydrate, lipids, protein and nucleic acids.
- They will also be able to understand the nature, mechanism and kinetics of enzyme action.
- The practical included in the course will enable the students to demonstrate qualitatively the presence of functional groups in carbohydrates, proteins and lipids and also working principle of salivary amylase.

4. Semester IV (General):

Code: ZOO-HG-4016: Genetics and Evolutionary Biology

- Students will learn the fundamental genetics like Mendelian and Non Mendelian inheritance, linkage, mutation and sex determination of various animals.
- They will also be able know about population genetics, origin of species, speciation and extinction.

B.Sc. Major (Non- CBCS)

5. Semester V:

Paper: M-501: Animal Physiology

- The students will be introduced to the terminologies and working mechanism relating to various organs systems in animal physiology- Digestive System, Respiratory system, Blood and Physiology of Heart, Excretory System, Nervous System and Muscle chemistry

- They will also learn about osmoregulation in vertebrates.

Paper: M-502: Biochemistry and Bioenergetics

- The students will learn about the chemical foundation of biology- pH. pK , acid and base, buffer and free energy.
- Students will understand the basis and fundamental biochemistry of carbohydrate, lipids, protein and nucleic acids.
- They will also be able to understand the nature, mechanism and kinetics of enzyme action.
- Students will understand the role of thermodynamics in biology and ATP in metabolism.

Paper: M-503: Endocrinology and Immunology

- Students will understand the basis of hormone and histology and functioning of endocrine glands.
- They will learn about the synthesis and mechanism of hormone action and also role of hormones in various aspects of body functioning.
- Students will develop knowledge on structure and function of the components of an immune system.
- They will also be able to understand the concept of cell-mediated and humoral immune system and the working mechanism behind vaccination.

Paper: M-504: Biological Techniques and Biostatistics

- The students will be able to understand the working principle and use of instruments such as- pH meter, Colorimeter, Spectrometer, Ultra Centrifuge and Microscope.
- The will also be introduced with biological techniques like separation techniques using- chromatography and electrophoresis; microtomy, cryopreservation and autoradiography.
- Students will also understand the various aspects of biostatistics such as Central tendencies, t- test, chi-square, correlation and regression and also its utility in biology.

- Students will also be familiarized with basic computational tools.

Paper: M-505: Physiology (Practical)

- The practical will enable the student to demonstrate and determine the ABO blood group, estimation of RBC, WBC and Haemoglobin and also preparation of haemin crystal.

- They will also learn to demonstrate the cardiac cycle in frog/rat using kymograph.

Paper: M-506: Biochemistry and Endocrinology (Practical)

- The practical included in the course will enable the students to demonstrate quantitatively total glucose, total proteins and total lipids, ascorbic acid, vitamin A, mono, di, tri polysaccharides and also working principle of salivary amylase/pepsin.

- They will also learn to separate amino acid using separation technique- paper chromatography and also visualize endocrine gland through dissection.

2. Semester VI:

Paper: M-601: Animal Behavior

- Students will know in details about pattern of behavior, survival strategies, social and cooperative behavior.

- The learner will also be able to understand the mode of communication the animals uses.

Paper: M-602: Evolution and Adaptation

- Students will learn about different theories on origin and evolution of life on earth particularly that of human, horse and bird.

- Zoogeography included in the course will enable the students to understand the pattern of distribution of animal with the help of pertaining theories – Plate tectonic and Continental Drift Theory.

- They will also understand how study of fossil helps in tracing back evolution.
- The survival strategies adopted by organism in the course of evolution – adaptation and mimicry will also be taught to the students

Paper: M-603:Economic Zoology

- Students will learn how commercial aspects of zoology and hence will be introduced to commercial farming and management- Sericulture, Apiculture, Aquaculture, Lac culture.
- They will learn in details about the rearing methodologies and preventive measures for disease control for maximum economic benefit.
- The students will also learn about pest and their various methods of management.

Paper: M-604: Biotechnology, Bioinformatics and computer application

- Students will learn basic concept of genetic engineering, tissue culture, cloning, gene libraries and gene transfer.
- They will also learn the integration between biology and informatics tools and basic computer application.

Paper: M-605: Economic Zoology (Practical)

- The students will learn to identify variety of silkworm, pest and commercially important fishes.
- They will also learn about life cycle of honey bee and prepare slide of its pollen basket.

Paper: M-606: Project

- This course aims to prepare the students for research purpose by introducing them to basis of research methods and methodologies and research writing.

B.Sc. General (Non-CBCS)

1. **Semester V:**

Paper: E-501: Cell Biology, Genetics and Developmental Biology.

- The learners will understands and be able to compares and differentiate between the prokaryotic and eukaryotic system.
- The students will be able understand the structures, cellular mechanisms and functioning of basic components of prokaryotic and eukaryotic cell component- particularly plasma membrane, endomembrane system, mitochondria and chromosome.
- Acquire the detailed knowledge of mechanism of cell division – mitosis and meiosis.
- Students will learn the fundamental genetics like, linkage, crossing over, sex determination of various animals, gene expression and mutation.
- They will gain knowledge on basic of developmental biology- gametogenesis, fertilization, cleavage, induction, extra embryonic membrane and parthenogenesis.

Paper: E-502: Cell Biology, Genetics and Developmental Biology (Practical)

- The students learn to demonstrate, barr body, mitosis and meiosis in onion root tip and grasshopper testis and also the staining techniques to visualize the nucleus, chromosomes and nucleolus.
- They will learn to identify different tissues and stages of development of frog embryo.

2. **SEMESTER VI**

Paper: E-601: Physiology, Biochemistry and Endocrinology.

- The students will be introduced to the terminologies and working mechanism relating to various organs systems in animal physiology- Digestive System, Respiratory system, Blood, Excretory System and Nervous System.
- The students will learn about the chemical foundation of biology- pH. pK , acid and base, buffer and free energy.

- Students will understand the basis and fundamental biochemistry of carbohydrate, lipids, protein and nucleic acids and cellular respiration.

- They will also be able to understand the nature, mechanism and kinetics of enzyme action.

- They will be briefed with the overall outline of endocrinology and regulation of hormone.

- Basic knowledge on biostatistics- Central tendencies and graphical representations will also be taught to the students.

Paper: E-601: Physiology, Biochemistry and Endocrinology (Practical)

- The practical will enable the student to demonstrate and determine the ABO blood group, estimation of RBC, WBC and Haemoglobin and also preparation of haemin crystal.

- The practical included in the course will enable the students to demonstrate glucose (mono, di, tri polysaccharides, proteins and lipids, and also working principle of salivary amylase/pepsin.

- They will also learn to dissect and visualize weberian ossicle and pituitary gland of fish.

DEPARTMENTOFPHYSICS

BISWANATH COLLEGE

PROGRAMMEOUTCOMES

PROGRAMME: B.SC.PHYSICS

LinktoGUSyllabus:

1. Physics Regular (NEP):
   https://syllabus.gauhati.ac.in/fyugp/streams/science/physical#h.tjoyqzm30u9e

2. PhysicsRegular(CBCS):https://sites.google.com/a/gauhati.ac.in/syllabus-ug-cbcs/regular/physics

1. KnowledgeandUnderstanding:

a. InMathematicalPhysics,studentsgettheopportunitytolearnvectors,vector calculus, Differential Equations, Matrices, Tensor Analysis, and Complex Variablesetc.

b. Studentslearnvariousfactsof Electricity andMagnetism.They alsolearn thebasics oftransmissionlines,principleofoperationofelectricmotors,electricgenerator.A comprehensive review on Gauss's Law and its applications in determination of Electricfieldintensityindifferentelectricalsetup.

c. Studentswillgainadequateknowledgeonlaws of thermodynamicsandits applications in Heat engine, refrigerator etc. They will also grasp the utility of second lawindescribingentropy of thermodynamicsystemsanditsconnection toevolution of universe.

d. Studentswilllearn thebasics of electronics,principle of operation of diodes, transistors etc. It will help in understanding the working of rectifiers used for AC-DC conversion, amplifiers etc.

e. StudentsgettheopportunitytolearnvariouscomputationaltechniqueslikeC,C++, FORTRAN, and Python. They will also be made acquainted to software's like MATLAB,MATHEMATICA.However,becauseoftimeconstraintitmaynotbe possible to learn enough on every language or software's.

f. Students learn the evolution of different Atom Models discussed underAtomicPhysics. The program will enable students to understand the physics of Hydrogen spectra, fine structure lines in spectroscopy and splitting of spectral lines in external fields. It has far reaching implications in understanding the composition ofastrophysical objects of interest.

g. Students will learn the theories and models of Nuclear and Particle Physics. This knowledge willhelpin understanding the workingof modern day detectors,counters.

TheconceptofBindingEnergywillhelpinunderstandingthefundamentalsof nuclear stability.

h. With the introduction of Statistical Physics, students will understand the physics of many particlesystems.Theknowledgeon classical andquantum statisticswill describethebehaviorofBose-Einstein'sCondensate, Fermi pressure and the behaviorofwhitedwarfstar.

i. Students will learn geometrical optics, physical optics and holography to understand various optical phenomena and will understand thedesigning of optical instruments.

j. The physics of bodies moving at speed comparable to light is indeed very interesting and it conceptualize the understanding on different frame of reference. The studentswill learn Special Theory of Relativity and its applications.

2. Developmentofintellectualfaculties:

a. Mathematics is the language of Physics. The course willpromotelogical and analytical thinking amongst students.

b. Students will eventually develop the art of relating the facts learned in different papers and this will inculcate constructive thinking and will develop problem solving capacity.

c. Duringtheprocessofperformingexperiments,asystematicapproachis required. This systematic study develops a sense of chronological approachtowards a problem.

d. In performing experiments relatedto Electronics paper, students will acquire the skill of designing circuit and assembling components.

e. Whilelearningvariousfacts,studentswilldevelopasenseofvisualization.It will help them tograsp the nature of subatomic particles andbehaviour ofdifferent physical systems of interest.

f. Studentswilldevelopimaginativepowerandwillalsoacquiretheskillto estimate measurements or make legitimate guess in physics problems.

3. PracticalSkills:

a. Studentslearnthebasicmeasuringtechniquesoflengthusingslidecallipers, screw gauge, spherometer etc.

b. Studentswillgettheexposuretocertainexperimentsofelectricity,thermal physics, mechanics, nuclear physics, electronics and so forth.

c. Studentswilllearnhowtohandleanalogand digitalmultimeters.Theywillexperience the utility of different electronic instruments.

d. Students will get the opportunity to handle function generator and CRO (Cathode Ray Oscilloscope). By this process, they will learn to measure frequency, wavelength of a wave or signal.
e. Students are supposed to pursue a project on a novel topic. This fosters a sense of creativityamongstthestudents.Also,thestudentswillgetabasicfeelof research. They will acquire some computational skill, writing skill and willdevelop physical insight on the problem.
f. Students will get hands-on training on the latest computational techniques like Python, Sci-Lab etc.

3. **CommunicationandOtherSkills:**

a. Studentsareallowedtoprepareatopicholisticallyandafterthattheyareasked to present. This polishes their communication skills. In other words, the communication skill is developed.
b. While performing the projectwork, students are encouraged toparticipatein group discussion with the supervisor, other faculty members and some of the students. This will develop a confidence and art of speaking/delivery in public platform. Sometimes projects are carried out in group. By that process, they develop a team spirit, sportsmanship etc.
c. The course exposes the students to various facets of computer programming and other relevant diagnostic techniques that may have important applications in developing future technology.

4. Prospectsofemployment:

(a) After the successful completion of this course, a student becomes eligible topursue higher studies such as MSc (Physics)in different reputed institution across the country.

(b) A student of BSc Physics can be absorbed as a science teacher in a school provided he/she fulfils other eligibility criteria.

(c) A student of BSc Physics may get the opportunity to pursue a course on Geophysics, Biophysics, Sound engineering and so forth.

(d) A student of BSc Physics may get employment in the fields of instrumentation, nuclear medicine, radiology etc.

(e) A student pursuing BSc in Physics may dream of getting placement as Scientists in reputed organization like ISRO, DRDO other research institutes like IUCAA, S.N. Bose institute, SINP, Kolkata after completion of Ph.D and adequate research in respective fields.

(f) StudentsmayundertakevarioustrainingaftercompletionofBScandmaygetascopeto

servethecountrythroughcivilservices.

(g) Students will get ample opportunity to build a career in reputed Govt. owned enterprises like OIL, ONGC, and IOCL after completion of BSc.

(h) TherearеopportunitiestogetaplacementinCentral,CooperativeBanksasPO,Asst BranchManager,andClientrelationshipofficeraftercompletion of BScinPhysics,which serves as eligibility criteria.

5. **Ethics**:

(a) In the process of projectpreparation students will bemade aware of IP tools such as copyright. They will learn about plagiarism issues and will practice genuine techniques in preparing projects and other reports related to academics. This will develop an independent feel and bring out creativity amongst students.

(b) Students will understand the protocols of Laboratory work and learn discipline in performing their duties.

Head
Deptt.ofPhysics

Course Objective andOutcome:

B.Sc.1st Semester

Subject:MathematicalPhysicsand Mechanics **SubjectCode:PHY0100104**

CourseObjective

1. The students will beintroducedtoMathematical toolsneeded toaddress any problems in Theoretical Physics.

2. To introduce the concepts of dynamics of particles, energy, oscillation and basic properties of matter which will enable students to address different Physics problems in practical sense.
3. Thecoursewillgiveknowledge about Vector Calculus, Curvilinear Coordinates, and Special Functions which have proved to be vital components in understanding key concepts of Electrodynamics, Quantum Mechanics, and Statistical Mechanics.
4. To train the students with concept visualization through some laboratory practices.
5. Thecourseisdesignedinaframeworkthatcaninculcateanalyticalthinkingamong the students.

CourseOutcome:

Afterthecompletionofthecourse-

1. Students will acquire adequate knowledge about Vector Calculus, concept of curved spaces and its applications in various fields.
2. The course will enable the students to apply the knowledge of Dirac Delta function in handling and solving complicated Physics problems with ease.

3. At the end of the course, the students are expected to understand the importance of differentcoordinatesystemsi.e.Cartesian,sphericalandcylindricalinstudying Physics.
4. Students will be able to understand the concepts of dynamics of particles, energy, oscillation and basic properties of matter its applications in various technological applications.

5. Thecoursewilltrain students in concept realization and implementation through laboratory experiments.

LearningObjective&Outcomes

B.Sc.2ndSemester

Subject:Mathematical Physics and Electricity and Magnetism SubjectCode:PHY0200104

CourseObjective:

1. To introduce the methods of solving Differential Equations.
2. To introduce various concepts of matrix algebra.
3. Introduction to potential formulation to solve Electrostatics problems.
4. To develop theoretical foundation on magnetic fields of current carrying conductors, torus, solenoids. Study on magnetic properties of matter.
5. To study and analyze AC circuits and learn the usage of Network Theorems.

Course Outcomes

Afterthecompletionofthecourse,Studentswillbeableto-

1. Understand the methods of solving Differential Equation, evolution of a physical system and trajectory of objects in Classical world.
2. Apply matrix algebra in Physical problems.
3. Graspthеconcept of magnetic fields in matter, dielectric properties, and applications of Kirchoff's law in different electrical circuits.
4. Understand the working of multimeters and potentiometer.

BiswanathCollege,BiswanathChariali

DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.3rdSemester

Subject:MathematicalPhysicsII **SubjectCode:PHY-HC-3016**

LearningObjective

1. Toteachstudentsabouttheanalyticalfunctions,developtheconceptofsingularity, Frobenius Method, Partial Differential Equations.

2. TointroduceFourierseriestothestudentsandshowtheapplicationsinsquareand triangular waves.

3. ThecoursediscussestheutilityofHermitian,antiHermitian,symmetric, antisymmetric matrix which will find applications in Quantum Mechanics to be studiedin the subsequent semester.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto

1. Solve second order ODE using Power series and Frobenius method.
2. Understandtheutility of Legendre Polynomial, Hermite polynomial, Laguerre's polynomialandtheirsignificanceinElectrodynamics,solutionofSchrodinger equation.

3. Visualizethemathematicaloriginofcomplexwavepatterninsignalprocessing.

4. DoFourieranalysistounderstandthecomplicatedperiodicfunction.

BiswanathCollege,BiswanathChariali

DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.3rdSemester

Subject:T hermalPh ys ics **SubjectCode:PHY-HC-3026**

LearningObjective

1. Toteachtheapplicationsof1st,2ndLawsofThermodynamicsandintroducethe thermodynamic parameters.
2. TodemonstratetheworkingofHeatEngine,Refrigerator,Carnotcycle.
3. Tointroducetheconceptofentropy,Secondlawintermsofentropyandits consequence.
4. The develop the concept of Maxwell's Thermodynamic Relations and its applications.
5. TodiscusstheutilityofClausius-Clapeyeronequationanddescriptionof thevariation of boiling and melting point with pressure.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto

1. UnderstandthephysicsofThermodynamicsystems,theirphasebehavior,conversion mechanism of heat into work.
2. Graspthеconceptofreversibleandirreversibleprocesses,Firstlawindifferent thermodynamic processes.
3. Gainknowledgeonvariousthermodynamicpotentialsandtherelationsbetween them.
4. Understandthephasediagramofthermodynamicsystemsandtoassesstheorderof phase transition with the use of free energy.
5. Developskilltoidentifyanddescribevariousthermodynamicvariables.
6. Figure out the deviation of real gas from ideal ga

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DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.3rdSemester

Subject:DigitalS yst ems andApplic at ions **SubjectCode:PHY-HC-3036**

Learningobjectives

1. ThecoursewillintroduceCROanditsfunctioningtothestudents.
2. Toteachtheutilityof activeandpassivecomponentsinelectricalcircuit.
3. ItisdesignedtofamiliarizestudentswithIntegratedCircuitsanditsclassifications.
4. ThecourseincludestopicsonBooleanAlgebrawhichwillhelpinrealizingthe logic of different gates.
5. Thecoursediscussessequentialcircuits,memoryelements.
6. ThecoursewillalsointroduceMicroprocessoranditsutility tothestudents.

Learningoutcomes

1. Studentswillbeabletoapplytheknowledgeof Booleanalgebraindesigning digital circuits.
2. Studentswillbeabletoanalyzecombinationallogiccircuits.
3. Students will be able to analyze and design sequential logic circuits.
4. Studentswillgain knowledge on different IC's and their utility in designing electricalcircuitsusedinmodernaccessories.

BiswanathCollege,BiswanathChariali

DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.4th Semester

Subject:Mathe mat icalPhysic sI II **SubjectCode:PHY-HC-4016**

LearningObjective

1. Toteachthebasicsofcomplexalgebra,analyticfunctionsandsingularity.
2. Tointroduceresiduetheoremanditsapplicationsindifferentphysicalsystems.
3. TodeveloptheconceptofFourierspaceandtransformationofvariablesfromreal space to Fourier space.
4. The course aimsatdevelopingaconcreteideaon tensor analysis amongthestudents with the introduction to kronecker delta, Levi-Civita symbols.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto

1. UnderstandtheMathematicaltoolsneededtoaddressSpecialandGeneralTheoryof Relativity; learn Particle Physics in the future.
2. Apply the knowledge of Fourier and Laplace's Transforms in solving Differential Equations.
3. Grasptheutilityofcontravariantandco-varianttensors.

LearningObjective&Outcomes

B.Sc.4thSemester

Subject:ElementsofModernPhysics **Subjectcode:PHY-HC-4026**

LearningObjective

ThisCourseEnabletheStudentsto

1. LearnthebridgeconnectingClassicalandQuantumPhysics.
2. Understandthelimitationsof Classical Physicswithconcretediscussion onBlack Body radiation, Photoelectric effect and Compton scattering.
3. Grasp the concept of wave particle duality of subatomic particles and its implications, Schrodinger equation for nonrelativistic particles, energy, momentum operators in quantum world.
4. Learn the emission mechanism of alpha, beta and gamma rays from unstable nuclei, utility of semi empirical mass formula, concept of mass defect.
5. Learn about the principle of harnessing nuclear energy, thermonuclear fusion on earth and its success till date.
6. LearnaboutLaserPhysicsanditsvastutilityin thefieldofmedicine,industry.

LearningOutcomes

Uponsuccessfulcompletionofthiscourseitisintendedthatastudentwillbeableto:

1. Derive the Planck's Radiation Formula with the understanding of discrete exchange ofenergybetweenmatterandradiation,conceptofprobability.Thiswillbeusefulto formulate Wien's Displacement law that can help in measurement of surface temperatureofstellarobjects.
2. UnderstandtheapplicationofQuantumideainmeasuringthepowerradiatedoffa stellar body.
3. DistinguishthecharacteristicsofQuantummechanicalsystemsfromtheclassicalones.
4. AcquireadequateknowledgeonBindingEnergycurvewhichcanbehelpfulin explaining several nuclear phenomena and importance of magic number.
5. Learn the physicsof He-Ne andRuby Laseranditsvastapplicationsin theindustrial and medical sectors.

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DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.4thSemester

Subject:AnalogSystems&Applications **SubjectCode:PHY-HC-4036**

LearningObjective

1. Tolearnthephysicsofsemiconductordevices,physicalconceptofbandgapand biasing of diodes.

2. LearntheusageofRectifiersinconversionofACtoDC,applicationsofZenerdiode as voltage regulator.

3. The course intends to present a detail description of Transistors and its various configurations. The mechanism of current flow in active electrical components is also included.

4. The course will establish the underlying physical concept of transistor acting as an amplifier and switch.

5. To learn about OPAMP and its utility as an adder, subtractor, Differentiator in analog electronics.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto

1. UnderstandtheworkingofPNjunctiondiodes,photodiodes,zenerdiodes,solarcell etc. as applications of Semiconductor Physics.
2. Gainknowledgeonamplifiercircuitandthemechanismoffeedbackinsuch amplifiers.
3. UnderstandtheutilityofOPAMPandoscillatorcircuitsinelectronicdevices.

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DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.(Physics)5thSemester

Subject:QuantumMechanics&Applications **SubjectCode:PHY-HC-5016**

LearningObjective

1. To teach the students about time dependent Schrodinger Equation, energy, momentum operators, Eigen functions.

2. Tohelpstudentsinanalyzingthephysicalmeaningofwavefunctions,the normalizationandorthogonality relationconcerningthewavefunctionassociatedwith a quantum mechanical system.

3. StudentswillbetaughtabouttimeindependentSchrodingerequation,wavepackets and linear combination of stationary states.

4. To teach the application of Schrodinger equation in Hydrogen like atoms and simple harmonic oscillator.

5. To course intends to provide a detail description on the key concepts of atomic physics such as vector atom model, spectroscopic property of multi electronic atoms and their behavior in electric and magnetic fields.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto

1. Understand the fundamentals of Quantum Mechanics and the developed framework to understand the behavior of atoms and subatomic particles.
2. Graspthеconceptoffreeparticle,stationary andnon-stationary states,themethodfor solving Schrodinger equation in time dependent and time independent situations.
3. Learntheconceptofspatialquantization,spinningelectronhypothesisanditsapplications in spectroscopy.
4. Learn about the physical origin of fine structure lines, its intensity and various selection rules of Quantum mechanical origin.
5. Analyzethesplittingofspectrallinesinelectricandmagneticfields:Starkand Zeeman effect.

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DepartmentofPhysics

LearningObjective&Outcomes

B.Sc.5th Semester

Subject:SolidStatePhysics **SubjectCode:PHY-HC-5026**

Learningobjectives

1. To introduce crystalline solids, concept of unit cell, miller indices, reciprocal latticeand Bravais lattice to the students.
2. To teach X ray diffraction : Bragg's law as an experimental diagnostic for analysis of crystal structure.
3. Tohighlighttheimportanceofspecificheatandpresentadetaildescriptionofspecific heat for solids: Dulong'sPetit's law, Debye-Einsteintheory.
4. Todiscuss about the magnetic properties of solids, Spontaneous magnetization, Curie's law,Hysteresisandenergyloss.
5. Thecourseisdesignedtoteachstudentsaboutdielectricpropertiesofmaterials,dispersion relation of normal modes.
6. ToteachthestudentsaboutFreeElectron theory,WeidmanFranzlawandtheband theory for distinguishing conductors, semiconductors and insulators.
7. TointroduceSuperconductivity,Meissnereffectandtheapplications.

Learningoutcomes

1. Studentswilllearnaboutvarioustypesofcrystallinesolids,theirpackingfraction, interatomic force and hardness and softness of solids.
2. Studentswilllearnaboutthebehaviorofspecificheatofsolidsatlowtemperature.
3. Studentswillunderstandtherelationbetweenthermalandelectricalconductivityof solids.
4. Thecoursewillenablestudentstolearnaboutcooperpairinganditsconsequence, critical temperature and critical magnetic field and its significance.
5. StudentswillalsolearnaboutHalleffectanditsapplicationsindetectingPtype,N type SCs and in measuring conductivity.

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DepartmentofPhysics

LearningObjective&Outcomes

B. Sc. 5th Semester

Subject: AdvancedMathematicalPhysicsI**Subject Code:PHY-HE-5036**

Learningobjectives

1. ToteachthestudentsaboutLinearindependenceanddependenceofavector.
2. ToteachaboutEigenvalues,Eigenvectorsandrotationsin3Dinmatrixalgebra.
3. StudentswillbeintroducedtoMinkowskispace,symmetricandanti-symmetrictensor and metric tensor.

Learningoutcomes

UponCompletionofthecoursestudentswillbeableto-

1. GraspknowledgeonmatrixalgebraLinearVectorSpaceandTensor.
2. Dealwiththeadvancedmathematicaltoolstoaddressproblemsintheoreticalphysics.

LearningObjective&Outcomes

B.Sc.6thSemester

Subject: ElectromagneticTheory **SubjectCode:**PHY-HC-6016

Learningobjectives

1. Toreview the Maxwell's Equations, furnish a detail discussion on Lorentz and Coulombgaugetransformationequations,propagationofEMwavethroughvacuum, dielectric and conducting medium.
2. Tomakethestudentsacquaintedwithreflectionandrefractionofplanewavesatthe interface, Fresnel's Formula, Polarization and Brewster's law.
3. Togiveideaonnumerical aperture,singleandmultiplemodefibers.

Learningoutcomes

UponCompletionofthecoursestudentswillbeableto-

1. EvaluateEMenergydensityandquantifyrateofenergyflowthroughasurface.
2. GainknowledgeonPoyntingVector,formulateenergyconservationprincipleinthelight of Poynting Theorem.
3. Studentswillunderstandthepropagationof EMwavesinhomogenousisotropicmedia.
4. Learnabouttheboundaryconditionsoperativeattheinterface.Determinationof Reflection , Transmission coefficients and Fresnel's formula.

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DepartmentofPhysics

Subject: StatisticalMechanics **SubjectCode:** PHY-HC-6026

Learningobjectives

1. To introduce the concept of macro state, microstate, develop idea on configuration/phase space.
2. Toavailadetaildiscussionondifferenttypesofensembleadmissibleinrealphysical systems.
3. Toacquaintstudentswiththecharacteristicsof thermalradiation.Classicaldescription of radiation with the formulation of Wien's law, Rayleigh-Jeans law.
4. Toprovideadequate knowledge on Quantum theory of radiation, describe Planck's radiationformulaanditsimplications.
5. To discuss in detail Classical and Quantum Statistics and description of many body systems in the light of Distribution law formulated for MB, BE and FD statistics.

LearningOutcome

UponCompletionofthecoursestudentswillbeableto-

1. Understand the application of Statistical Mechanics in addressing various problems of Astrophysics, Plasma Physics also in Chemistry and Life sciences.
2. Describe the behavior of many body systems such as a container filled with gas or a metallic sample with millions of electrons.It can be accomplished with the utility of the Classical and Quantum Statistics.
3. Utilize Wien's Displacement law for measurement of surface temperature of celestial objects, Stefan's law for measurement of radiated power from anobject.
4. Grasp the failure of Classical Rayleigh Jean's and Wien's law in describing the Black Body radiation.Understandtheconceptof UltravioletCatastrophe.

LearningObjective

1. To teach the students about time dependent Schrodinger Equation, energy, momentum operators, Eigen functions.

2. Tohelpstudentsinanalyzingthephysicalmeaningof wavefunctions,the normalization and orthogonality relation concerning the wave function associated with a quantum mechanical system.

3. StudentswillbetaughtabouttimeindependentSchrodingerequation,wavepackets and linear combination of stationary states.

4. To teach the application of Schrodinger equation in one Dimensional potential barrier, 1D Harmonic Oscillator.

5. To course intends to provide a detail description on development of QuantumMechanics,failureof Classicalidea,DescriptionofBlackBody Radiation and Planck's QuantumHypothesis.

6. To develop idea on Celestial coordinates, stellar magnitude system and spectroscopic Parallax to measure distance in astrophysical scenario.

LearningOutcomes

Afterthecompletionofthecourse,Studentswillbeableto-

1. Understand the fundamentals of Quantum Mechanics and the developed framework to understand the behavior of atoms and subatomic particles.
2. Grasp the concept of free particle, stationary and non-stationary states, the method for solving Schrodinger equation in time dependent and time independent situations.
3. VisualizetheimportanceofQuantumtunnelingindevices.
4. Graspthe knowledgeofstellarmagnitudeanddistancemeasurementsystem.
5. UnderstandthespectralclassificationandStellarEvolution.

BiswanathCollege,BiswanathChariali

DepartmentofPhysics

DEPARTMENT OF CHEMISTRY

Programme Outcomes: B.Sc. in Chemistry

After successful completion of three year degree program in Chemistry a student should be able to;

1. Demonstrate, solve and understand the major concepts in all disciplines of chemistry.
2. Solve the problem and also think methodically, independently and draw a logical conclusion.
3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyse the results of chemical reactions.
4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
5. Find out the green route for chemical reaction for sustainable development.
6. To inculcate the scientific temperament in the students and outside the scientific community.
7. Use modern techniques, decent equipments and chemistry softwares.

Course Outcomes: B. Sc. Chemistry (Honours Course/Major)

Semester I (FYUGP)	
Course	**Outcomes**
Chemistry I: CHE0100104	On successful completion, students would have ➢ Basic insight into the fundamental aspects of atoms, ions and molecules in terms of their electronic structure and reactivity which are dealt with basic quantum chemistry treatment. ➢ They will know periodic classification of elements to illustrate the changes in properties along the periods and groups to be emphasized upon. ➢ A clear understanding of states of matter. ➢
Laboratory Course I	➢ The laboratory course assigned will help students to identify and handle laboratory apparatus and instruments, preparation of standard solutions, measurement of physical properties, and laboratory safety etc. ➢ Calibration of apparatus (volumetric flask, thermometer, melting point apparatus etc.) ➢ Students will be able to measure the surface tension and viscosity of a given solution using certain method specified in the course and to study the variation of the both property of the solution with concentration of the solute. ➢ Students will be able to work in a chemical laboratory following standard safety protocols.

CHE-SEC: SEC0101003 Basic Analytical Chemistry	Upon completion of this course, students will be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
Semester II	
Chemistry II: CHE0200104	On successful completion of this course, students will have ➢ Extensive concepts of chemical bonding and coordination chemistry. The students will be familiarized with the organic reactive intermediates. ➢ Clear elementary concepts of acidity, basicity and thermodynamics. ➢ They shall also understand the chemistry from a thermodynamic point of view.
Laboratory Course II	➢ Laboratory course help students to appreciate the concepts and to hone the experimental skills. ➢ Students will acquire preliminary training on quantitative analysis, synthesis of coordination compounds, qualitative analysis of organic compounds and measurement of a few basic thermodynamic parameters.
CHE-SEC: PHARMACEUTICAL CHEMISTRY	➢ This primary objective of this course is to introduce students to the fundamentals of drug design and development process, drugs for various diseases available in market, their mode of action and side effects. Students are expected to learn the biosynthetic procedures of various bio-relevant small molecules. ➢ Students will be able to appreciate the drug development process, identify various small molecules used for treatments different ailments and other physiological processes
CHE-SEC: LAB	➢ By laboratory experiments, students will be able to prepare drugs of common use such as analgesic, antipyretic, antacid etc.
Semester III	
CHE-HC-3016: Inorganic Chemistry-II	On successful completion of this course students would be able ➢ To apply theoretical principles of redox chemistry in the understanding of metallurgical processes. ➢ To identify the variety of s and p block compounds and comprehend their preparation, structure, bonding, properties and uses. ➢ To explain the use of terms Hard and Soft in relation to metal ions and ligands terms of hard and soft interactions and discuss the stability of complexes. ➢ To explain chemistry of noble gases and their compounds; application of

	VSEPR theory in explaining structure and bonding to know about Inorganic polymers and their uses.
CHE-HC-3016: LAB	Experiments in this course will boost their quantitative estimation skills and introduce the students to preparative methods in inorganic chemistry.
CHE-HC-3026: Organic Chemistry-II	Students will be able ➢ To learn and differentiate between various organic functional groups and method of their synthesis. ➢ To classify organic compounds in terms of their functional groups and reactivity. ➢ To explain, analyse and design transformations between different functional groups. ➢ To learn about the different reaction mechanism involves in the given functional group transformations.
CHE-HC-3026: LAB	In this course, students will have hands on experience on test of functional groups present in a given organic sample by systematic analysis, preparation of some organic compounds using conventional method or green approach.
CHE-HC-3036: Physical Chemistry-III	The students are expected to learn ➢ Phase equilibrium and its application in some specific systems. They will also learn the most important thermodynamic property "chemical potential", the Clausius-Clapeyron equation phase diagram for one component system, solid-liquid equilibria involving eutectic, congruent and incongruent melting points etc. ➢ In the Chemical kinetics chapter they will learn rate laws of chemical transformation, experimental methods of rate law determination, steady state approximation, rate determining state approximation etc. ➢ In the Surface chemistry chapter students will be able to understand different types of surface adsorption processes and basics of catalysis including enzyme catalysis, acid base catalysis and particle size effect on catalysis.
CHE-HC-3036: LAB	On successful completion, students will be able to conduct the physical experiments of phase eqilibria viz., construction of phase diagram, determination of critical solution temperature and composition of the phenol-water system, study the effect of impurities on critical solution temperature and composition of the phenol-water system, determination of distribution coefficient, study the equilibrium and kinetic of a reaction. They will also able to study a given absorption isotherm.

CHE-SE-3034: Basic Analytical Chemistry	Upon completion of this course, students will be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
Semester IV	
CHE-HC-4016: Inorganic Chemistry-III	On successful completion, students will be able to ➢ Name coordination compounds according to IUPAC, explain bonding in this class of compounds, understand their various properties in terms of CFSE and predict reactivity, d-orbital splitting in complexes, chelate effect, polynuclear, labile and inert complexes. ➢ Understanding the nomenclature of coordination compounds/ complexes, Molecular orbital theory, d- orbital splitting in tetrahedral, octahedral, square planar complexes, chelate effects. ➢ To appreciate the general trends in the properties of transition elements in the periodic table and identify differences among the rows, and chemistry of first raw transition elements. ➢ Understanding the transition metals stability in reactions, origin of colour and magnetic properties. ➢ Understanding the separation of Lanthanides and Actinides, its colour, spectra and magnetic behaviour. ➢ Understanding the bioinorganic chemistry of metal ions in biological systems, Haemoglobin-storage and transfer of iron, Na/K pump, Carbonic anhydrase and Carboxypeptidase, about trace metals. ➢ Toxicity of various metals and mechanism of metal-biological interactions, use of chelating agents in medicine.
CHE-HC-4016: LAB	Through the experiments students will be able to prepare, estimate or separate metal complexes/compounds but also will be able to design experiments independently which they should be able to apply if and when required.
CHE-HC-4026: Organic Chemistry-III	After the completion of the course, students willlearn ➢ To identify and classify different types of N-based derivatives, alkaloids, terpenes, heterocyclic compounds and polynuclear hydrocarbonds. ➢ To explain their structureand reactivity. ➢ To critically examine their synthesis and reactions mechanism. ➢ About the synthetic applications of diazonium salts. ➢ To identify the natural source of alkaloids and terpenes and systematic elucidation of their structure.

CHE-HC-4026: LAB	In this course, students are expected to learn to detect the extra elements and function groups present in a given organic sample.
CHE-HC-4036: Physical Chemistry-IV	➢ In this course the students will learn theories of conductance and electrochemistry. ➢ Students will also understand some very important topics such as solubility and solubility products, ionic products of water, conductometric titrations etc. ➢ The students are also expected to understand the various parts of electrochemical cells along with Faraday's Laws of electrolysis. ➢ The students will also gain basic theoretical idea of electrical & magnetic properties of atoms and molecules.
CHE-HC-4036: LAB	On completion of the course, the student should be able to determine a cell constant, equivalent conductance, degree of dissociation and dissociation constant of a weak acid, to perform various conductometric and potentiometric acid-base titrations.
CHE-SE-4034: PHARMACEUTICAL CHEMISTRY	➢ This primary objective of this course is to introduce students to the fundamentals of drug design and development process, drugs for various diseases available in market, their mode of action and side effects. Students are expected to learn the biosynthetic procedures of various bio-relevant small molecules. ➢ Students will be able to appreciate the drug development process, identify various small molecules used for treatments different ailments and other physiological processes
CHE-SE-4034: LAB	➢ By laboratory experiments, students will be able to prepare drugs of common use such as analgesic, antipyretic, antacid etc.
Semester V	
CHE-HC-5016: Organic Chemistry-IV	➢ This course will help students to know structures of nucleic acids, amino acids and pharmaceutical compounds. Students will be able to explain/describe the important features of nucleic acids, amino acids and enzymes and develop their ability to examine their properties and applications. ➢ Students will be familiarized with the importance of nucleic acids, amino acids and develop basic understanding of enzymes, bioenergetics and pharmaceutical compounds.
CHE-HC-5016: LAB	The laboratory course will help ➢ To estimate proteins by various methods like Sorenson's method, Lowry's

	method etc. ➢ To understand the action of enzymes at optimum condition and at various temperatures. They will also know how to isolate and characterize DNA from naturally available species. ➢ To have a clear understanding on determination and importance of iodine number of any given fat/oil.
CHE-HC-5026: PHYSICAL CHEMISTRY V	Tthe students are expected to understand ➢ The application of quantum mechanics in some simple chemical systems such as hydrogen atom or hydrogen like ions. The students will also learn chemical bonding in some simple molecular systems. ➢ They will be able to understand the basics of various kinds of spectroscopic techniques and photochemistry.
CHE-HC-5026: LAB	➢ This laboratory course mainly focuses on the preparation of solutions of various concentrations for UV spectrophotometer and understanding the absorbance spectra with concentration change. Also it will help to understand the pH-dependence and effect of structure of various organic compounds on the UV-Vis spectrum. ➢ The Colourimetric experiments will help the students to verify the Lambert-Beer's law and determine the concentration of a solution of unknown concentration. It will also give knowledge on the kinetics, dissociation constant and analysis of vibration-rotation spectrum.
CHE-HE-5026: ANALYTICAL METHODS IN CHEMISTRY	➢ On successful completion, students will have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. At the same time through the experiments students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.
CHE-HE-5026: LAB	➢ The laboratory experiments will complement the needs of students who wish to learn more about the qualitative/quantitative characterization and separation techniques. ➢ Students will have hands on experience on instrumental techniques for characterization of samples through chemical analysis.
CHE-HE-5056: POLYMER CHEMISTRY	➢ This polymer chemistry syllabus will introduce the theory and applications of polymer chemistry to the students. Some industrially important polymers and conducting polymers, a promising class of polymeric materials for next generation devices will also be discussed as mentioned.

	➢ After completion of this course, the students will learn the definition and classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc. They also learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.
CHE-HE-5056: LAB	➢ Through the laboratory course, students will have hands on preparation methods for various industrially important polymers/resins and conducting polymers etc. ➢ Students will have knowledge on the characterization of polymers through mechanical analysis, molecular weight determination by viscosity average and end group analysis, hydroxyl group determination by colorimetric method etc. ➢ Students will also know how to analyse polymers through IR studies, DSC analysis etc.
Semester VI	
CHE-HC-6016: Inorganic Chemistry-IV	By studying this course the students will be expected to learn about ➢ How ligand substitution and redox reactions take place in coordination complexes. ➢ Students will also learn about organometallic compounds, comprehend their bonding, stability, reactivity and uses. They will be familiar with the variety of catalysts based on transition metals and their application in industry. ➢ On successful completion, students in general will be able to appreciate the use of concepts like solubility product, common ion effect, pH etc. in analysis of ions and how a clever design of reactions, it is possible to identify the components in a mixture.
CHE-HC-6016: LAB	➢ With the experiments related to coordination compound synthesis, calculation of 10Dq, controlling factors etc. will make the students appreciate the concepts of theory in experiments. ➢ The students will also know the absorbance maximum of synthesized coordination complexes through UV-Visible spectra analysis.
CHE-HC-6026: Organic Chemistry**-V**	➢ In this course, students will get introduction to carbohydrate chemistry, dyes and polymers. They are expected to learn about the different spectroscopic techniques and their applications in organic chemistry. ➢ Students shall be apprised with carbohydrate chemistry, dyes and polymers and their structure, reactivity and chemical properties. ➢ Students will also be able to explain/describe basic principles of different

	spectroscopic techniques and their importance in chemical/organic analysis. ➢ Students shall be able to classify/identify/critically examine carbohydrates, polymers and dye materials.
CHE-HC-6026: LAB	➢ Students through these experiments will be able ➢ To extract and purify various organic compounds, and also to prepare polymers/resins through various methods. Apart from it, various carbohydrates like aldoses, ketoses, reducing and non-reducing sugars etc shall be analysed. ➢ To qualitatively analyse unknown organic compounds containing monofunctional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc. ➢ Students will also be able to identify simple organic compounds by IR spectroscopy and NMR spectroscopy
CHE-HE-6026: Industrial Chemicals And Environment	➢ After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. ➢ Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. ➢ Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly "green chemistry" in chemical industry.
CHE-HE-6026: LAB	➢ Through these laboratory experiments, students will learn to ➢ Qualitatively and quantitatively analyse the soil and water quality of various water and soil bodies. ➢ Students will know to study some of the common bio-indicators of pollution, also will be able calculate percentage of available chlorine in bleaching powder.
CHE-HE-6046: LAB	➢ Dissertation

Course Outcomes: B. Sc. Chemistry (Minor/Regular Course/Generic Elective)

Semester I	
Course	**Outcomes**
Chemistry I:	On successful completion, students would have ➢ Basic insight into the fundamental aspects of atoms, ions and molecules in

	terms of their electronic structure and reactivity which are dealt with basic quantum chemistry treatment. ➢ They will know periodic classification of elements to illustrate the changes in properties along the periods and groups to be emphasized upon. ➢ A clear understanding of states of matter. ➢
Laboratory Course I	➢ The laboratory course assigned will help students to identify and handle laboratory apparatus and instruments, preparation of standard solutions, measurement of physical properties, and laboratory safety etc. ➢ Calibration of apparatus (volumetric flask, thermometer, melting point apparatus etc.) ➢ Students will be able to measure the surface tension and viscosity of a given solution using certain method specified in the course and to study the variation of the both property of the solution with concentration of the solute. ➢ Students will be able to work in a chemical laboratory following standard safety protocols.
Semester II	
Chemistry II	On successful completion of this course, students will have ➢ Extensive concepts of chemical bonding and coordination chemistry. The students will be familiarized with the organic reactive intermediates. ➢ Clear elementary concepts of acidity, basicity and thermodynamics. ➢ They shall also understand the chemistry from a thermodynamic point of view.
Laboratory Course II	➢ Laboratory course help students to appreciate the concepts and to hone the experimental skills. ➢ Students will acquire preliminary training on quantitative analysis, synthesis of coordination compounds, qualitative analysis of organic compounds and measurement of a few basic thermodynamic parameters.
Semester III	
CHE-RC/HG-3014: Chemistry-3	After completion of this course the students will able to understand the chemical system from thermodynamic point of view. They will also learn two very important topics in chemistry-chemical equilibrium and ionic equilibrium. In organic chemistry part, the students are expected to learn various classes of organic molecules-alkyl halides, aryl halides, alcohols, phenols, ethers, aldehydes and ketones.
CHE-RC/HG-3012-LAB:	In this course, students will have hands on experience on the measurement of P^H

Chemistry-3	of commercially available food drinks, shampoos and soaps. Also gain experience of preparing buffer solution and measurement of its pH. In the organic part, students will learn to purify organic compounds by crystallisation, recrystallisation and distillation. They are also expected to learn organic synthesis and check the purity of the synthesized compounds by measuring their melting point and boiling points.
CHE-SE-3034: Basic Analytical Chemistry	Upon completion of this course, students will be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
Semester IV	
CHE-RC/HG-4014: Chemistry-4	After completion of this course the students will learn solutions, phase rule and its application in specific cases, basic of conductance and electrochemistry. Students will also learn some important topics of organic and biochemistry-carboxylic acids, amines, amino acids, peptides, proteins and carbohydrates.
CHE-RC/HG-4012-LAB: Chemistry-4	In this course, students will learn to conduct the study of equilibrium of a given reaction, phase equilibrium, determination of conductance and potentiometric acid-base titration. In the organic part, they will learn the systematic qualitative organic analysis, preparation of derivatives and chromatographic separation of organic mixtures, determination, differentiation and extraction of organic compounds using specified analytical techniques.
Semester V	
CHE-HE-5026: Analytical Methods In Chemistry	➢ On successful completion, students will have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. At the same time through the experiments students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.
CHE-HE-5026: LAB	➢ The laboratory experiments will complement the needs of students who wish to learn more about the qualitative/quantitative characterization and separation techniques. ➢ Students will have hands on experience on instrumental techniques for characterization of samples through chemical analysis.
CHE-RE-5056: POLYMER CHEMISTRY	➢ This polymer chemistry syllabus will introduce the theory and applications of polymer chemistry to the students. Some industrially important polymers and conducting polymers, a promising class of polymeric materials for next generation devices will also be discussed as mentioned. ➢ After completion of this course, the students will learn the definition and

	classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc. They also learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.
CHE-RE-5056: LAB	➢ Through the laboratory course, students will have hands on preparation methods for various industrially important polymers/resins and conducting polymers etc. ➢ Students will have knowledge on the characterization of polymers through mechanical analysis, molecular weight determination by viscosity average and end group analysis, hydroxyl group determination by colorimetric method etc. ➢ Students will also know how to analyse polymers through IR studies, DSC analysis etc.
CHE-SE-5014: Chemical Technology & Society	➢ Students shall be familiarized with processes and terminologies in chemical industry, like mass balance, energy balance etc. ➢ Learners will be able to use chemical and scientific literacy as a means to better understand the topics related to the society.
Semester VI	
CHE-RE-6026: Industrial Chemicals And Environment	➢ After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. ➢ Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. ➢ Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly “green chemistry” in chemical industry.
CHE-RE-6026: LAB	➢ Through these laboratory experiments, students will learn to ➢ Qualitatively and quantitatively analyse the soil and water quality of various water and soil bodies. ➢ Students will know to study some of the common bio-indicators of pollution, also will be able calculate percentage of available chlorine in bleaching powder.
CHE-SE-6024: Pesticide Chemistry	➢ Students will be able to explain or describe and critically examine different types of pesticides, their activity/toxicity and their applications and the need for the search of an alternative based on natural products. ➢ Definition of pesticides, general introduction to pesticides (natural and

	synthetic), benefits and adverse effects of pesticides. Classification, mode of action, toxicity and methods of pesticides residue analysis. ➢ Synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene); organophosphate (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor)
CHE-SE-6024: LAB Pesticide Chemistry	➢ The laboratory experiments train students to prepare various organophospate based pesticides and to calculate their respective acidity/alkalinity as per BIS specifications.

Signature of HOD

MATHEMATICS DEPARTMENT

BISWANATH COLLEGE

COURSE OUTCOMES FOR MATHEMATICS

NEP FYUGP SEM I:CLASSICAL ALGEBRA(MAT0101104)

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Identifysymmetricfunctionsoftherootsforcubicandbiquadraticequations,solve cubicandbiquadraticequations.

2.Recognizeconsistentandinconsistentsystemsoflinearequationsbytherowech elonformoftheaugmentedmatrixandcalculatetheinverseandrank of a matrix.

3.ClassifyandcomputeLearnhowtofindthenatureoftherootsofagivenpolynomialequati onbyDescartes'rule

4.Express the basic concepts of exponential,logarithmicandhyperbolic functions of complexnumbers.

5.Apply DeMoivre'stheoreminanumber ofapplications tosolvenumericalproblems.

SEC0108203:Programmingin C

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.UnderstandandapplytheprogrammingconceptsofCwhichisimportanttomathematical investigation and problem solving.

2.Learnaboutstructureddata-typesinCandlearnaboutapplicationsinfactorizationofaninteger and understandingCartesian geometryand Pythagorean triples.

3.Useofcontainersandtemplatesinvariousapplicationsinalgebra.

4.Usemathematicallibrariesforcomputationalobjectives.

5.Representtheoutputsofprogramsvisuallyintermsofwellformattedtextandplots.

6.Inpracticalstudentslearnabouttherootsofaquadraticequation,solutionofanequationusing N-Ralgorithm,sin(x),cos(x)withthehelpoffunctions.

NEP FYUGP SEM II:CALCULUS(MAT020104)

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Describe asymptotic behavior in terms of limits involving infinity.

2.Recognizefunctionoftwovariablesandoperatethepartialderivatives.

3.Express continuity and differentiability in terms of limits.

4.Calculateintegrationswhichcanbesolvedbyreductionformula

5.Use the mean value theorems.

PAPER NAME:LaTeX

PAPER CODE:SEC0206803

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Create and typeset a LaTex document

2.Typeset a mathematical document using LaTex

3.Learn about creating simple pictures using LaTex.

4.Create a beamer presentation.

CBCS COURSE OUTCOMES

MAT-HC-3016:TheoryofRealFunctions

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Havearigorousunderstandingoftheconceptoflimitofafunction.

2.Learnaboutcontinuityanduniformcontinuityoffunctionsdefinedonintervals.

3.Understandgeometricalpropertiesofcontinuousfunctionsonclosedandboundedintervals.

4.Learnextensivelyabouttheconceptofdifferentiabilityusinglimits,leadin gtoabetterunderstandingfor applications.

5.KnowaboutapplicationsofmeanvaluetheoremsandTaylor'stheorem.

MAT-HC-3026:GroupTheory-I

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Recognizethemathematicalobjectsthatare groups,and classifythemasabelian,Cyclicand permutation groups, etc.

2.Linkthefundamentalconceptsofgroupsandsymmetricalfigures.

3.Analyzethesubgroupsofcyclicgroupsandclassifysubgroupsofcyclicgroups.

4.Explainthesignificanceofthenotionofcosets,normalsubgroupsandfactorgroups.

5.LearnaboutLagrange'stheoremandFermat'sLittletheorem.

6.Knowaboutgrouphomomorphismsandgroupisomorphisms.

MAT-HC-3036:AnalyticalGeometry

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

1.Learnconicsectionsand transformco-ordinate systems

2.Learnpolarequation of a conic,tangent, normalandproperties

3.Havea rigorousunderstandingoftheconcept ofthree-dimensionalcoordinates systems

MAT-HG-3016/MAT-RC-3016:DifferentialEquations

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

i) Learnbasicsofdifferentialequationsandmathematicalmodelling.

ii) Solvefirstordernon-lineardifferentialequationsandlineardifferentialequationsofhigherorder using various techniques.

SEMESTER-IV

MAT-HC-4016:MultivariateCalculus

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

i) Learntheconceptualvariationswhenadvancingincalculusfromonevariabletomultivariabledi scussion.
ii) Understandthemaximizationandminimizationofmultivariablefunctionssubjecttothegivenc onstraintsonvariables.
iii) Learnaboutinter-relationshipamongstthelineintegral,doubleandtripleintegralformulations.
iv) FamiliarizewithGreen's,Stokes'andGaussdivergencetheorems.

MAT-HC-4026:NumericalMethods

i) Learnsomenumericalmethodstofindthezeroesofnonlinearfunctionsofasinglevariablean dsolutionofasystemof linear equations, up to a certain given level of precision.
ii) Knowaboutmethodstosolvesystemoflinearequations,suchasFalsepositionmethod,Fixedpoint iterationmethod,Newton'smethod,Secantmethod,LUdecomposition.
iii) Interpolationtechniquestocomputethevaluesforatabulatedfunctionatpointsnot inthe table. Applicationsofnumericaldifferentiationandintegrationtoconvertdifferentialequationsinto differenceequationsfor numerical solutions.

MAT-HC-4036:RingTheory

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Appreciatethesignificanceofuniquefactorizationinringsandintegraldomains.
ii) Learnaboutthefundamentalconceptofrings,integraldomainsandfields.
iii) Knowaboutringhomomorphismsandisomorphismstheoremsof rings.
iv) learnaboutthepolynomialringsovercommutativerings,integraldomains,Euclideandomains ,andUFD.

MAT-SE-4024:LaTeXandHTML

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) CreateandtypesetaLaTeX document.
ii) TypesetamathematicaldocumentusingLaTex.
iii) LearnaboutpicturesandgraphicsinLaTex.
iv) Createbeamerpresentations.
v) Createwebpageusing HTML.

MAT-HG-4016/MAT-RC-4016:RealAnalysis

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Understandmanypropertiesoftherealline R,includingcompletenessandArc himedean properties.
ii) Learntodefinesequencesintermsoffunctionsfrom Rtoasubsetof R.
iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
(IV)Applytheratio,rootandlimitcomparisontestsforconvergenceandabsoluteconver genceofaninfiniteseriesofrealnumbers.

MAT-HC-5016:ComplexAnalysis

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Learnthesignificance ofdifferentiabilityofcomplexfunctionsleadingtothe understandingofCauchy−Riemann equations.

ii) Learnsomeelementaryfunctionsandvaluatethecontourintegrals.
iii) UnderstandtheroleofCauchy−GoursattheoremandtheCauchyintegral formula.
iv) ExpandsomesimplefunctionsastheirTaylorandLaurentseries,classifythenature ofsingularities,findresiduesand apply Cauchy Residue theorem to evaluate integrals.

MAT-HC-5026:LinearAlgebra

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Learnabouttheconceptoflinearindependenceofvectorsoverafield,andthedimensionofavecto rspace.
ii) Basicconceptsoflineartransformations,dimension theorem,matrixrepresentationofalineartransformation,andthe change of coordinate matrix.
iii) Computethecharacteristicpolynomial,eigenvalues,eigenvectors,andeigenspaces,as wellasthegeometricandthe algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.
iv) Computeinnerproductsanddetermineorthogonalityonvectorspaces,includingGram−S chmidtorthogonalizationto obtain orthonormal basis.
v) Findtheadjoint,normal,unitaryandorthogonal operators.

MAT-HE-5016:NumberTheory

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Learnaboutsomefascinatingdiscoveriesrelatedtothepropertiesofprimenumbers, andsomeoftheopenproblemsin number theory, viz., Goldbach conjecture etc.
ii) Knowaboutnumbertheoreticfunctionsandmodular arithmetic.
iii) Solvelinear,quadraticandsystemoflinearcongruenceequations.

MAT-HE-5066:ProgramminginC

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

i) Understandandapplytheprogrammingconceptsof Cwhichisimportanttomathematical investigationandproblem solving.
ii) Learnaboutstructureddata-typesinCandlearnaboutapplicationsinfactorizationofanintegerandunderstanding Cartesian geometry and Pythagorean triples.
iii) Useofcontainersandtemplatesinvariousapplicationsinalgebra.
iv) Usemathematicallibrariesforcomputationalobjectives.
v) Representtheoutputsofprogramsvisuallyintermsofwellformattedtextand plots.
vi) Inpracticalstudentslearnabout the rootsofaquadraticequation,solutionofanequationusingN-Ralgorithm,sin(x), cos(x) with the help of functions.

SEMESTER-VI

MAT-HC-6016:RiemannIntegrationandMetricspaces

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:

i) Learnaboutsomeoftheclassesandpropertiesof Riemannintegrablefunctions,and

theapplicationsoftheFundamental theorems of integration.
ii) Knowaboutimproperintegralsincluding,betaandgammafunctions.
iii) Learnvariousnaturalandabstractformulationsofdistanceonthesetsofusualorunusualen tities.Becomeawareone such formulations leading to metric spaces.
iv) Analysehowatheoryadvancesfromaparticularframetoageneralframe.
v) Appreciatethemathematicalunderstandingofvariousgeometricalconcepts,viz.Ball s orconnectedsetsetc.inan abstract setting.
vi) KnowaboutBanachfixedpointtheorem,whosefar-reachingconsequenceshave resultedintoanindependentbranchof study in analysis, known as fixed point theory.
Learnaboutthetwoimportanttopological
properties,namelyconnectednessandcompactnessofmetricspaces.

MAT-HC-6026:PartialDifferentialEquations

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Formulate,classifyandtransformfirstorderPDEsintocanonical form.
ii) LearnaboutmethodofcharacteristicsandseparationofvariablestosolvefirstorderPDE's.
iii) ClassifyandsolvesecondorderlinearPDEs.
iv) LearnaboutCauchyproblemforsecondorderPDEandhomogeneousandnon-homogeneouswave equations.
v) Applythemethodofseparationofvariablesforsolvingmanywell-knownsecondorderPDEs.

MAT-HE-6066:GroupTheory II

COURSE OUTCOMES: Thestudentswhotake thiscoursewill beable to:
i) Learnaboutautomorphismsforconstructingnewgroupsfromthegivengroup.
ii) Learnaboutthefactthatexternaldirectproductappliestodatasecurityandelectric circuits.
iii) Understandfundamentaltheoremoffiniteabeliangroups.
iv) BefamiliarwithgroupactionsandconjugacyinSn.
v) UnderstandSylow'stheoremsandtheirapplications.

DEPARTMENT OF ZOOLOGY (2023-24)

Programme Outcomes (P.O):

- The program will help the students to know the basic fundamentals of Biological Science and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue advanced degree courses.
- The effort has been made through this program to make the study relevant, interesting and encouraging to the students to join the industry or to prepare them for higher studies including research.
- The program will provide an insight learning of fundamentals of Zoology.
- The program will provide the basic understanding of the nature of living organisms.
- It will help the students to understand the relationship of living organisms with its surrounding.
- The program would provide an insight to the learner about the existence of different life forms on the Earth, and appreciate the diversity of animal life.
- It helps in learning how life survives and grows.
- It helps in developing empathy and conservation towards nature
- It helps to understand the conservation strategy and protection of living organisms.

Programme Specific outcomes (P.S.O):

- It will make the students aware about the characteristic morphological and anatomical features of diverse animals.
- It will enable the students to understand the behaviour, characteristics and evolutionary trends of animals.
- It provides a platform to understand various forces which bring about variations among populations of a species and cause them to diversify into new species.
- The analysis of pedigree leading to development of analytical skills and critical thinking enabling the students to present the conclusion of their findings in a scientific manner.
- Helps in gaining knowledge in economic, ecological and medical significance of various animals in human life; and will create interest among them to explore the animal diversity in nature.
- Helps students to understand the events that lead to formation of a multicellular organism from a single fertilized egg, the zygote.
- It apprises the student with the working of the immune system in normal health and how it fights the disease and may sometimes contributes to disease.
- Helps in understanding various kinds of physical, chemical and biological processes within ecological system and its interaction among different components of the system.
- It will help in understanding the fundamental principles of cell biology, physiology, biochemistry, genetics, ecology, endocrinology, immunology, evolutionary biology and computational biology.
- It provides an insight understanding of the functioning of our body system, also underpins the health and well-being of living organism.

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- Students will develop the problem solving skills, laboratory skills, communication skills, team skills as well as ethics.

Course Specific outcomes (C.S.O):

NEP- Four Years Undergraduate Programme (FYUGP)

1. SEMESTER I (MAJOR AND MINOR):

Code: ~~ZOO-1011~~: Diversity of non-chordates: ZLG01000104

Students will able to characterise and classify the Protista, Porifera, Cnidaria, Ctenophora, Platyhelminths and Nemathelminthes upto the level of class and their specialized organs, symmetry and segmentation. Also helps in understanding the life-cycle and pathogenicity of various parasites and origin, evolution and significance of parasitism.

Code: SEC0101503: Basics of Laboratory Practices in Zoology

Students will learn the fundamental skills and knowledge required to carry out experiments and research in a zoological laboratory setting.

2. SEMESTER II (MAJOR AND MINOR):

Code:~~ZOO-1021~~:Diversity of Chordates: ZLG02000104

The students will understand the scope and historical background of chordates, basic concepts of origin of chordates and make the students understand the characteristics and classification of animals with notochord, helps in understanding the exclusive phenomena in chordates. Practical session will help the students to identify the specimens of different class and its evolutionary significance.

Code: SEC0106703:Non-Mulberry Sericulture

The objectives of the course are to apprise the students about the biology, rearing techniques, constrains of rearing in terms of disease occurrences, causes and precautions of diseases, and employment opportunities of non-mulberry sericulture. It will help the students to venture in sericulture industry by their own or through different state and central organizations and or pursuing higher studies in different research laboratories.

Honours (CBCS)

3. SEMESTER III:

Code: ZOO-HC-3016: Diversity of Chordates

The students will understand the scope and historical background of chordates, basic concepts of origin of chordates and make the students understand the characteristics and classification of animals with notochord, helps in understanding the exclusive phenomena in chordates. Practical session will help the students to identify the specimens of different class and its evolutionary significance

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Code: ZOO-HC-3026: Animal physiology: Controlling and coordinating system

The students will study the life, specially, how cell, tissues and organs functions. Students will understand the interactions of various organ systems. This course will also help in explaining how all physiological systems work in unison to maintain homeostasis in the body and use of feedback loops to control the same.

Code: ZOO-HC-3036: Fundamentals of Biochemistry

Students will understand the foundation knowledge of biochemistry of carbohydrate, lipids, protein and nucleic acid. Students will learn the nature, mechanism and kinetics of enzyme action. Students will know about classical laboratory techniques, conduct qualitative demonstration, and analyze the resulting data. Be knowledgeable in proper procedures and regulations in handling and disposal of chemicals.

Code: ZOO-SE-3014: Ornamental Fish and Fisheries

Students will learn about the diversity of fish in North East India. They will learn in details about aquarium construction and the basic necessities in an aquarium. Also students will able to identify the ornamental fish and their management.

4. SEMESTER IV:

Code: ZOO-HC-4016: Comparative anatomy of Vertebrate

Student will learn the comparative account of integument, skeletal components, digestive system, respiratory system, circulatory system, nervous system and sensory system and their modifications in different vertebrates. Practical session will enable the students to visualize and demonstrate different types of scales in fish, carpase and plastron in tortoise and mammalian skull.

Code: ZOO-HC-4026: Animal physiology: Life Sustaining System

Students will understand the interactions of various organ systems resulting in the complex overall functioning of the body including the physiology of digestion, respiration, renal physiology, blood and biology of heart. Students will understand the normal body functions and intricate relationship between each of the system and disorder associated with the failure of any of this system.

CODE: ZOO-HC-4036: Biochemistry of Metabolic Processes

Students will be able to understand the principles of catabolic and anabolic processes, carbohydrate, protein and lipid metabolism and correlate it practical observations, Understand the process of energy production in the body and will perform practicals related to metabolic processes.

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Code: ZOO-SE-4014: Non-Mulberry Sericulture

Students will learn about the history, present status of mulberry and non-mulberry sericulture. They will also able to learn the life cycles, rearing, pest management and entrepreneurship in non-mulberry sericulture.

5. SEMESTER V:

Code: ZOO-HC-5016: Molecular Biology

Students will understanding the molecular mechanisms governing biological processes. Students will gain knowledge of the structure and function of key biomolecules like DNA, RNA, and proteins, and how these molecules interact to regulate cellular processes.

Code: ZOO-HC-5026: Principles of Genetics

The course will cover principles of genetic inheritance, gene mapping, and mutagenesis, and their implications in areas like biotechnology and medicine. Students will learn the basic principles of inheritance, including Mendelian genetics, and be able to apply these principles to predict inheritance patterns in both simple and complex traits.

Code: ZOO-HE-5016: Computational Biology and Biostatistics

The course "Computational Biology and Biostatistics" combines computational techniques with statistical methods to analyze biological data and Students will gain practical knowledge in bioinformatics applications such as sequence alignment, gene expression analysis, protein structure prediction, and phylogenetic analysis.

Code: ZOO-HE-5036: Endocrinology

Students will gain an in-depth understanding of the synthesis, secretion, and regulation of hormones by the endocrine glands, and how these hormones regulate growth, metabolism, reproduction, and stress response. Students will learn about experimental methods used in endocrinology research, including hormone assays, receptor studies, and animal models to study endocrine function and disease.

6. SEMESTER VI:

Code: ZOO-HC-6016: Developmental Biology

Students will gain knowledge of the key stages of development, including fertilization, cleavage, gastrulation, organogenesis, and differentiation, and how these processes contribute to the formation of the body plan in various organisms. Students will become familiar with various model organisms (e.g.,

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Date.....

Drosophila, zebrafish, mice) used in developmental biology research and how these models have contributed to our understanding of development.

Code: ZOO-HC-6026: Evolutionary Biology

Students will gain a solid foundation in the core principles of evolutionary biology, including natural selection, genetic drift, mutation, and gene flow, and how they shape the diversity of life. Students will gain insight into the evidence supporting evolutionary theory, including the fossil record, comparative anatomy, molecular biology, and biogeography, which provide clues about the history of life on Earth.

Code: ZOO-HE-6026: FISH and Fisheries

Students will gain knowledge of the anatomy, physiology, and classification of fish species, including the differences between freshwater and marine fish, and the role of fish in aquatic ecosystems. Students will develop the ability to analyze fisheries-related issues, apply sustainable practices, and develop strategies to balance the economic, ecological, and social aspects of fish and fisheries management

Code: ZOO-HE-6056: DISSERTATION

Students will learn to identify research questions, formulate hypotheses, and apply critical thinking to solve complex problems within their chosen area of study. They will also evaluate and interpret the results in a meaningful way. Students will enhance their academic writing skills by producing a well-organized, coherent dissertation that follows academic standards. They will also gain the ability to present their research findings effectively in both written and oral formats.

B.Sc. Honours General(CBCS)

1. SEMESTER I
Code: ZOO-HG-1016: Animal Diversity

Students will be able to understand the fundamental principles of systematic in which the Protists, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nemathalminthes, Arthropoda, Mollusca, Echinodermata, Protochordates and Vertebrates are classified according to their characters up to class. Students will also able to learn about the life cycle, parental and specialized organ systems. Practical sessions will help the students to identify different organisms belonging to different phyla.

2. SEMESTER II :
Code: ZOO-HG-2016: Comparative Anatomy and Development Biology of Vertebrates

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Student will learn the comparative account of integument, skeletal components, digestive system, respiratory system, circulatory system, nervous system and sensory system and their modifications in different vertebrates. Students will learn the different aspects of early, late and post embryonic developments and its control.

3. SEMESTER III :

Code: ZOO-HG-3016: Physiology and Biochemistry

Students will understand the interactions of various organ systems resulting in the complex overall functioning of the body including the physiology of nervous system, muscle, reproductive system and endocrine system. Students will understand the foundation knowledge of biochemistry of carbohydrate, lipids, protein and nucleic acid. Students will learn the nature, mechanism and kinetics of enzyme action. Students will know about classical laboratory techniques, conduct qualitative demonstration, and analyze the resulting data.

4. SEMESTER IV :

Code: ZOO-HG-4016: Genetics and Evolutionary Biology

Students will learn the fundamentals of genetics like Mendelian and Non-Mendelian inheritance, linkage, mutation and sex determination of various animals. They will also understand about population genetics, origin of species, speciation and extinction.

5. SEMESTER V :

CODE: ZOO-RE-5026: Applied Zoology

Students will gain an understanding of how zoological concepts, such as animal behavior, physiology, and ecology, can be applied to solve problems in various sectors including agriculture, healthcare, and environmental management. Students will learn how principles of applied zoology are used in integrated pest management (IPM), including the control of harmful pests through biological, chemical, and ecological approaches.

6. SEMESTER VI :

CODE: ZOO-RE-6016 : Aquatic Biology

Students will gain knowledge of the structure and function of freshwater and marine ecosystems, including the physical, chemical, and biological factors that influence aquatic life and ecosystem dynamics.

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DEPARTMENT OF GEOGRAPHY

BISWANATH COLLEGE

ACADEMIC SESSION 2023-24

Program outcomes, program specific outcomes and course outcomes for Geography under Choice-based Credit System (CBCS)

The BA Geography Honors course is designed by the affiliating University i.e. Gauhati University and approved in the Academic Council held on 8/11/2019 where a Choice-based Credit System (CBCS) has been implemented since the academic session 2019. The geography honors syllabus broadly encompasses two major areas of geographical studies- Physical and Human Geography. Physical Geography deals with the understanding and study of Earth's physical features including landforms, rivers, oceans, atmosphere, etc. Whereas Human Geography consists of the study and analysis of spatial patterns and processes which are intricately related with human activities, culture and history.

Program Outcomes (POs)

Graduates of the **BA/BSc (Honours) in Geography** program will enable to:

1. **Understand the Earth's Physical and Human Systems** – Gain knowledge about natural and human-made geographic systems, including landforms, climate, population, and economic activities.
2. **Apply Geographic Techniques** – Utilize cartographic, statistical, and GIS-based methods for data collection, analysis, and presentation.
3. **Analyse Spatial Patterns and Processes** – Evaluate the interactions between physical and human geography, such as environmental changes, urbanization, and regional development.
4. **Conduct Field Research and Data Collection** – Develop skills in fieldwork, surveying, and observation for practical applications in geographical studies.
5. **Engage in Sustainable Development and Disaster Management** – Understand environmental challenges and propose solutions for sustainable resource management and disaster risk reduction.
6. **Develop Critical Thinking and Problem-Solving Skills** – Use quantitative and qualitative methods to address geographical problems and interpret spatial data.
7. **Enhance Communication and Technological Proficiency** – Effectively present geographic information using modern tools like GIS, remote sensing, and thematic mapping.
8. **Prepare for Higher Studies and Careers** – Gain a solid foundation for pursuing postgraduate studies, research, and careers in teaching, planning, environmental management, and related fields.

Odd Semester:

Course Outcome for 3rd Semester

Credit and Marks distribution scheme for CBCS Curriculum: Honours Course (IIIrd Semester)

Semester	Course Type	Paper Code	Paper Name	Credits	Full Marks
Semester III Credit: 28 Marks: 500	Honours Core	GGY - HC - 3016:	Economic Geography	4+2=6	100
		GGY - HC - 3026:	Geography of India with Special Reference to North- East India	4+2=6	100
		GGY - HC - 3036:	Quantitative Methods in Geography	4+2=6	100
	Skill Enhancement Course (any one)	GGY - SE - 3044:	River Basin Studies	2+2=4	100
		GGY - SE - 3054:	Thematic Cartography	2+2=4	100
	Generic Elective paper (any one)	GGY - HG - 3066:	Economic Geography	4+2=6	100
		GGY - HG - 3076:	Cartographic Methods	4+2=6	100

Course Name: Economic Geography

Paper Code: GGY-HC-3016

This paper examines the role of geographical factors in shaping economic space, providing students with insights for research and academic exploration. It will also serve as a valuable resource for those preparing for UGC NET/SLET and other competitive exams, including civil services, by offering relevant perspectives on economic geography.

Course Name: Geography of India with Special Reference to N.E. India

Paper Code: GGY-HC-3026

This paper will help students develop a comprehensive understanding of Indian geography, including its physical, economic, social, and environmental dimensions. It will provide valuable insights into how geographical factors influence various aspects of the country's development. Additionally, the paper will be a useful resource for students preparing for competitive examinations, including civil services, by offering in-depth knowledge and analytical perspectives essential for tackling geography-related questions effectively.

Course Name: Quantitative Methods in Geography

Paper Code: GGY-HC-3036

This paper aims to equip students with a thorough understanding of statistical methods and techniques commonly used in geographical studies. It will cover essential statistical tools, including data collection, sampling methods, measures of central tendency, dispersion, correlation, and regression analysis, all of which are crucial for geographical research.

Additionally, students will gain expertise in the tabulation, analysis, and interpretation of geographical data. This includes organizing raw data into meaningful formats, using graphical and cartographic representations, and applying statistical techniques to derive insights. Such skills are essential for conducting spatial analysis, making informed decisions, and understanding complex geographical patterns and trends.

Course Name: Thematic Cartography

Paper Code: GGY–SE-3054

This paper aims to provide students with a comprehensive understanding of the importance of various mapping techniques in geographical studies. Maps are essential tools for spatial analysis, and mastering different methods of map preparation enables students to accurately represent and interpret geographical data.

Students will develop a general understanding of preparing different types of plans and maps, including topographic maps, thematic maps, cadastral maps, and climatological maps. They will learn how to use symbols, scales, projections, and coordinate systems to create maps that effectively convey spatial information.

Furthermore, the paper will introduce students to various cartographic techniques for representing different aspects of the Earth's surface. This includes contour mapping for elevation representation, choropleth and isopleth mapping for population and climate data, and flow maps for movement patterns. By acquiring these skills, students will be better equipped to analyse and visualize geographical phenomena in a meaningful and scientifically accurate manner.

Regular Course:

Course Name: Economic Geography

Paper Code: GGY-RC–3016

This paper will help students understand how geographical factors, such as location, climate, and resources, shape economic spaces. They will learn about the spatial distribution of economic activities like agriculture, industry, and trade, and how geography influences patterns of production, consumption, and exchange. The course will also highlight regional economic disparities caused by differences in resources, infrastructure, and human capital. This knowledge is essential for analysing economic landscapes and is valuable for careers in economic geography, urban planning, and regional development.

Course Outcome for 5th Semester

Credit and Marks distribution scheme for CBCS Curriculum: Honours Course (Vth Semester)

Semester V Marks 400 Credit 24	Honours Core	GGY - HC - 5016	Social and Political Geography	4+2=6	100
		GGY - HC - 5026	Field Techniques in Geography	4+2=6	100
	Discipline Specific Elective (Any two)	GGY - HE - 5036:	Geography of Transportation	4+2=6	100
		GGY - HE - 5046:	Regional Development and Planning	4+2=6	100
		GGY - HE - 5056:	Urban Geography	4+2=6	100
		GGY - HE - 5066:	Agricultural Geography	4+2=6	100

Course Name: Social and Political Geography

Paper Code: GGY-HC-5016

This course will provide students with a deep understanding of the social and political dimensions of geographical phenomena and their interconnectedness within the broader geographical context. Students will explore how social factors such as culture, population dynamics, migration, and urbanization interact with political structures, governance, and policies to shape geographical landscapes. The paper will examine the role of political geography in addressing issues such as borders, territorial disputes, geopolitical strategies, and the impact of political decisions on the environment and resource distribution.

The course will also delve into how geography influences political power, economic development, and social cohesion within regions and nations. By studying the complex interplay of social, cultural, economic, and political forces, students will develop a comprehensive understanding of the spatial organization of human societies and their governance systems.

Course Name: Field Techniques in Geography

Paper Code: GGY-HC-5026

This course will equip students with the skills to identify research problems, design methodologies, and use appropriate tools for conducting high-quality geographical research. Fieldwork will be a central component, allowing students to experience "geographical reality" and deepen their understanding through direct observation. They will engage with respondents, collect data via questionnaires, and gain hands-on experience in data collection. Additionally, students will learn how to design and write comprehensive field reports, enhancing their ability to present and analyse research findings effectively.

Course Name: Regional Development and Planning

Paper Code: GGY-HE–5046

This paper will help students understand the socio-economic disparities that exist both within and between countries, exploring the causes, consequences, and implications of these disparities. It will examine issues such as wealth inequality, access to resources, education, healthcare, and infrastructure, and how these factors contribute to regional and global differences in development. By analysing these disparities, students will gain insights into the complexities of global development, inequality, and the challenges facing various countries.

Additionally, the paper will provide valuable theoretical insights and perspectives for students who wish to pursue higher studies or research in the future. By studying key concepts in economic geography, development theory, and global inequalities, students will build a strong foundation for advanced academic work. They will be well-equipped to undertake research that addresses critical issues in development studies, international relations, and global economics.

Course Name: Urban Geography

Paper Code: GGY-HE-5056

This paper will help students understand how geographical factors shape urban spaces, including the distribution of populations, land use, transportation systems, and infrastructure within cities. It will explore how geographers study the spatial organization of urban areas, addressing issues such as urban sprawl, housing shortages, slums, traffic congestion, and environmental concerns. The paper will delve into the complex relationships between urban geography and socio-economic, political, and cultural factors that influence the growth and development of cities.

Moreover, the paper will build critical skills for students pursuing advanced studies in urban development and planning. It will provide them with the analytical tools and theoretical frameworks needed to understand urbanization patterns and challenges, as well as strategies for sustainable urban planning and policymaking. Students will gain insights into how geographical analysis can inform decision-making in areas such as land-use planning, resource management, and infrastructure development, preparing them for research or careers in urban studies, planning, and development.

Regular Course:

Course Name: Environmental Geography and Disaster Management

Paper Code: GGY-RE-5016

This paper will help students develop a deep understanding of various environmental issues, including natural disasters, that geographers commonly study. It will explore how environmental factors such as climate, landforms, and ecosystems influence the occurrence and impact of disasters like earthquakes, floods, cyclones, droughts, and landslides. Students will learn how geographers analyse the spatial patterns of these events, assess their causes and effects, and study the ways in which communities adapt to or mitigate disaster risks. The paper will also cover the role of human activities in exacerbating environmental problems, such as deforestation, pollution, and climate change, and the measures needed to address these issues. By studying these topics, students will gain a broader understanding of the complexities of environmental geography, helping them develop solutions for sustainable environmental management and disaster preparedness.

Even Semester:

Course Outcome for 4th Semester

Credit and Marks distribution scheme for CBCS Curriculum: Honours Course (IVth Semester)

Semester IV Marks 500 Credit 28	Honours Core	GGY - HC - 4016:	Environmental Geography and Disaster Management	4+2	100
		GGY - HC - 4026:	Population and Settlement Geography	4+2	100
		GGY - HC - 4036:	Remote Sensing , GIS and GPS	4+2	100
	Skill Enhancement Course (Any one)	GGY - SE - 4044:	Advanced Statistical Techniques for Spatial Analysis	2+2	100
		GGY - SE - 4054:	Surveying Techniques	2+2	100
	Generic Elective Paper (Any one)*	GGY - HG - 4066:	Geography of India with Reference N.E. India	4+2=6	100
		GGY - HG - 4076:	Population and Settlement Geography	4+2=6	100

Course Name: Environmental Geography and Disaster Management

Paper Code: GGY-HC-4016

This paper will help students develop a deeper understanding of key environmental issues, including climate change, biodiversity loss, pollution, deforestation, and natural disasters such as earthquakes, floods, cyclones, and landslides. It will explore how geographers analyse these issues using spatial and scientific approaches to assess their causes, impacts, and possible mitigation strategies.

Additionally, the paper will be highly beneficial for students preparing for various competitive examinations, including civil services, as it covers important topics relevant to environmental geography, disaster management, and sustainable development. By studying these concepts, students will enhance their analytical skills and gain insights into policy frameworks, environmental governance, and disaster preparedness, which are crucial for tackling geography-related questions in exams and real-world applications.

Course Name: Population and Settlement Geography

Paper Code: GGY-HC-4026

This paper will help students develop a comprehensive understanding of spatio-temporal changes in population and settlement characteristics, focusing on how these patterns evolve over time and space. It will examine key demographic factors such as population growth, density, distribution, migration, and urbanization, along with their underlying causes and consequences.

Students will also explore various settlement types, including rural and urban settlements, their spatial organization, and the socio-economic and environmental factors influencing their development. The paper will analyse trends in settlement expansion, infrastructure development, and land-use changes while addressing issues such as housing, slums, and urban planning.

By studying these concepts, students will gain insights into the dynamic relationship between human populations and their environments, equipping them with the analytical skills needed for research, policymaking, and competitive exams that include topics on population geography and urban studies.

Course Name: Remote Sensing, GIS and GPS

Paper Code: GGY-HC-4036

The paper on Remote Sensing, GIS, and GPS is instrumental in equipping students with essential skills in spatial data analysis, which is crucial for geographical research and real-world applications. Remote Sensing provides students with an understanding of satellite imagery, aerial photography, and sensor-based data collection techniques used to monitor and analyse Earth's surface changes over time.

Geographic Information Systems (GIS) enables students to store, manage, analyse, and visualize spatial data effectively. They will learn to integrate various datasets, perform spatial queries, and create thematic maps, which are valuable for urban planning, environmental management, disaster assessment, and resource allocation.

Global Positioning System (GPS) enhances students' abilities to accurately determine location, track movement, and collect geospatial data for mapping and navigation purposes. These skills are critical for research in fields such as land-use planning, transportation, climate studies, and natural resource management.

By mastering these technologies, students will be well-prepared to engage in advanced research programs, contribute to data-driven decision-making, and apply spatial analysis in various academic and professional domains.

Course Name: Surveying Techniques

Paper Code: GGY-SE-4054

This paper aims to provide students with a comprehensive understanding of surveying techniques and their significance in geographical studies. Surveying plays a crucial role in accurately measuring, mapping, and analysing spatial features of the Earth's surface, which is essential for land-use planning, infrastructure development, and environmental management.

Students will develop a general understanding of the preparation procedures for different types of plans and maps. This includes learning about cadastral maps for land ownership, topographical maps for elevation and terrain representation, and thematic maps for analysing population distribution, climate patterns, and resource allocation. The process of data collection, measurement, and cartographic representation will be explored to ensure accuracy in mapping.

Additionally, the paper will introduce students to various surveying techniques used for representing spatial objects and phenomena. These techniques include plane table surveying, chain and tape surveying, theodolite surveying, total station surveying, and GPS-based geodetic surveys. Each method has specific applications in capturing spatial data related to landforms, settlements, transportation networks, and environmental changes.

Regular Course:

Course Name: Geography of India with Reference N.E. India

Paper Code: GGY-RC-4016

This paper will help students gain a comprehensive understanding of Indian geography, covering its physical, economic, social, and cultural dimensions. Students will explore the diverse landscapes, climate zones, natural resources, and the complex interrelations between the environment and human activities in India. It will also examine the challenges and opportunities presented by India's geography in areas such as urbanization, regional development, and environmental sustainability. Additionally, the paper will be highly beneficial for students preparing for competitive examinations, including civil services, by providing essential insights into Indian geography, which is a critical topic in such exams. The knowledge gained will support both academic growth and exam preparation, helping students develop the analytical skills needed for a wide range of geographical and development-related questions.

Course Outcome for 6th Semester

Credit and Marks distribution scheme for CBCS Curriculum: Honours Course (VIth Semester)

Semester VI Marks 400 Credit 24	Honours Core	GGY - HC - 6016	Geographical Thought	4+2=6	100
		GGY - HC - 6026	Research Methods in Geography and Project Work	4+2=6	100
	Discipline Specific Elective (Any two)	GGY - HE - 6036	Geography of Health	4+2=6	100
		GGY - HE - 6046:	Hydrology	4+2=6	100
		GGY - HE - 6056:	Geography of Tourism	4=2=6	100
		GGY - HE - 6066:	Geography of Resources and Development	4+2=6	100

Course Name: Geographical Thought

Paper Code: GGY-HC-6016

This course offers a thorough foundation in geography, helping students develop a comprehensive understanding of the discipline's various branches, such as physical geography, human geography, and geographical techniques. It emphasizes how geography connects with other fields, equipping students with the knowledge needed to address a wide range of real-world issues.

By integrating both historical and contemporary perspectives, the course enables students to apply past geographical patterns and trends to understand current global challenges. This approach helps students grasp how historical events, environmental changes, and socio-economic developments have shaped present-day geographic problems. Students will learn how to use both traditional and modern geographical methods to analyse and interpret issues such as climate change, urbanization, resource distribution, and geopolitical conflicts,

preparing them to approach geographic problems from an informed and multi-faceted perspective.

Course Name: Research Methods in Geography and Project Work

Paper Code: GGY-HC-6026

This course is designed to guide students through the process of conducting quality geographical research, starting from identifying a research problem to effectively presenting research findings. It will teach students how to define a clear research question, develop hypotheses, and select appropriate methodologies for data collection and analysis. The course will cover both qualitative and quantitative research techniques, equipping students with the tools necessary to conduct robust and reliable research.

Students will learn about various research tools, including statistical software, geographic information systems (GIS), remote sensing, and fieldwork techniques, to gather and analyse data. The course will also emphasize the importance of research design, data interpretation, and ethical considerations in the research process. By mastering these steps and tools, students will be able to carry out high-quality research that contributes valuable insights to the field of geography.

Course Name: Geography of Health

Paper Code: GGY-HE–6036

This course will provide students with a deep understanding of human health and healthcare from a geographical perspective, focusing on how spatial factors influence the health of populations. It will explore the geographic distribution of diseases, healthcare access, and the social, economic, and environmental factors that impact health outcomes across different regions.

Students will learn about the various factors that influence human health, such as climate, geography, socioeconomic conditions, access to healthcare services, sanitation, and nutrition. The course will also examine the relationship between ecological settings and the occurrence of diseases, particularly how environmental conditions, such as pollution, water quality, and habitat destruction, can create conditions that either promote or hinder human health.

A key focus will be on the impact of global climate change on human health, particularly in the context of India. The course will explore how rising temperatures, altered rainfall patterns, and extreme weather events are affecting the spread of diseases like malaria, dengue, and cholera, as well as the broader implications for public health systems and healthcare delivery. Students will gain an understanding of how geography and environmental changes intersect to shape health outcomes, providing them with valuable insights into the complex relationship between the environment and human well-being.

Course Name: Geography of Tourism

Paper Code: GGY–HE-6056

This paper will help students understand the role of geographical factors in shaping tourism activities, focusing on how natural landscapes, climate, infrastructure, and socio-cultural elements influence tourism trends and development. It will explore how geographical

environments—such as mountains, coastlines, forests, and urban areas—serve as both attractions and resources for tourism, and how these areas must be carefully managed to ensure sustainable development.

Students will also examine the concept of carrying capacity, which refers to the ability of an environment to support tourism without causing irreversible damage. By studying these issues, students will learn to balance tourism growth with environmental conservation and social equity.

Furthermore, this paper will help build essential research skills for students aiming to pursue higher studies or research programs. By exploring key concepts in tourism geography, sustainability, and planning, students will gain the expertise needed to analyse tourism development and its impacts. The paper will also open career opportunities for students interested in working with tourism and eco-tourism planning agencies, equipping them to contribute to responsible tourism practices and the development of sustainable tourism strategies.

Regular Course:

Course Name: Social and Political Geography

Paper Code: GGY-RE-6016

This course will enable students to understand the social and political dimensions of geographical phenomena, focusing on how human activities, governance, and political systems interact with geographical factors. Students will explore how issues like migration, urbanization, resource distribution, and territorial disputes are influenced by social structures, political decisions, and geographical context. The course will also address how geography shapes political power, regional development, and the movement of goods and people. By studying these interconnections, students will gain a deeper understanding of how geographical factors contribute to social inequalities, political conflicts, and global challenges, preparing them to analyse complex issues from both a geographical and a socio-political perspective.

Program outcomes, program specific outcomes and course outcomes for Geography under NEP, 2020 (FYUGP Program)

The National Education Policy (NEP) 2020 is a transformative policy introduced by the Government of India to reform the country's education system. It replaces the NEP 1986 and aims to make Indian education more holistic, flexible, multidisciplinary, and globally competitive. Colleges affiliated to Gauhati University have adopted this policy since August, 2023.

Key Features of NEP 2020:

- Implementation of a Four-Year Undergraduate Programme (FYUGP) with multiple exit options.
- Establishment of a Multidisciplinary Education and Research Universities (MERUs) for excellence in higher education.
- Flexibility in choosing subjects and credit transfer through the Academic Bank of Credits (ABC).
- Encouragement of multidisciplinary education and holistic learning.

NEP 2020 envisions making India a global knowledge hub by providing flexible, inclusive, and skill-based education. It aims to bridge the gap between education and employability, ensuring universal access, equity, and quality in learning. The policy aligns with India's goal of achieving a knowledge-driven economy and empowering youth for the 21st century.

Odd Semester:

Course Outcome for 1st Semester (Major/Minor)

Course Name: Introduction to Physical Geography

This course provides an overview of Physical Geography, exploring the areas of Geomorphology, Climatology, Hydrology and Biogeographical studies.

In Unit I, students will learn about the historical development, branches, and interdisciplinary connections of Physical Geography. Unit II focuses on geomorphology, introducing key concepts like catastrophism, uniformitarianism, and landform development. Unit III covers climatology, examining atmospheric processes such as insolation, heat budget, pressure, wind systems, and precipitation. Unit IV explores oceanography, including the origin of ocean basins, currents, and the relationship between temperature and salinity. Finally, Unit V introduces biogeography, focusing on ecosystems, biodiversity, and ecological processes.

By the end of this course, students will develop analytical skills to interpret physical processes, understand environmental interactions, and apply geographical principles to real-world challenges. It prepares them for careers in environmental research, climate studies, and geographic sciences, fostering awareness of sustainability and Earth's dynamic systems.

Even Semester:

Course Outcome for 1st Semester (Major/Minor)

Course Name: Introduction to Human Geography

Course Outcome – Fundamentals of Human Geography

This course provides an overview of Human Geography, exploring the relationship between humans and their environment, cultural patterns, and spatial analysis.

In Unit I, students will understand the meaning, scope, and evolution of Human Geography and its connection with other social sciences. Unit II examines key concepts of man-environment relationships, including determinism, possibilism, and cultural determinism. Unit III introduces major schools of thought in Human Geography, such as Human Ecology, Landscape, and Locational Analysis. Unit IV explores the dynamic relationship between humans and the environment, analysing urbanization and human impact on nature across different geographical conditions. Finally, Unit V focuses on cultural aspects, discussing ethnicity, race, and the socio-economic differences between rural and urban environments.

By the end of this course, students will develop critical thinking skills to analyse human-environment interactions, understand spatial and cultural diversity, and apply geographic principles to real-world socio-environmental challenges.

BISWANATH COLLEGE

DEPARTMENT OF BODO

PROGRAMME: UNDERGRADUATE BODO MINOR (FYUGP)

Link to the GU Syllabus: Programs, GU - MIL

PROGRAMME OUTCOME:

After successful completion of the degree programme in BA Bodo Minor, the students will be able to:

- Know about the origin and development of the Bodo language.
- Know about the present status of the Bodo language.
- Know about the origin and development of Bodo's written literature.
- Understand the history of scripts in Bodo literature.
- Understand the concept, definitions of culture classifications and its relationship with society and literature.
- Know about the basic ideas of culture and Bodo culture.
- Know about the festivals, Folk dances and music of the Bodos.

COURSE SPECIFIC OUTCOMES (FYUGP)

Biswanath College is an affiliated college of Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. While designing the curriculum Gauhati University has mentioned some course outcomes. However, college experts have more outcomes from the course. Course-specific outcomes of Bodo Minor under FYUGP has been summarized below.

Semester: I

BOD0100104

Growth and Development of Bodo Language

- Students are expected to learn the origin and development of the Bodo Language.
- Students know about the Sino-Tibetan language family, Bodo and its cognate languages.
- Know about the present status of the Bodo language.

Semester: II

BOD0200104

Growth and Development of Bodo Literature (Inception to 1952

- Students will know about the origin and development of Bodo written literature.

- Know about the development of Bodo literature from Pre-Bibar Era to Bibar Era.
- The students learn the history of script in Bodo literature.

Semester: III

BOD0300104

Introduction to Culture and Bodo Culture

- The students learn the concept, definitions of culture classifications and its relationship with society and literature.
- Know the basic ideas of culture and Bodo culture.
- Know about the festivals, folk dances and music of the Bodos.

DEPARTMENT OF BODO

BISWANATH COLLEGE

PROGRAMME: BA BODO

Link to the GU Syllabus:

Bodo Regular (CBCS): https://syllabus.gauhati.ac.in/ug/courses/regular/bodo

PROGRAMME OUTCOME:

After successful completion of three years degree programme in BA Bodo the students will be able to:

- Know about the spelling system used in writing Bodo language.
- Practical application of Bodo language in different perspectives.
- Understand of non-fictional prose in the early and modern period.
- Know about the life and works of Kalam Kumar Brahma and his literary contribution to Bodo literature.
- Understand about different types of drama in Bodo literature.
- Know the influences of Assamese and Bangla drama in Bodo literature.
- Know about types of translation and translation from different aspects in Bodo.
- Know about the life and works of Nilkamal Brahma and his contributions to different genres of literature.
- Understand about Bodo novels and short stories.
- Get details ideas about manuscript preparation and the use of punctuation and symbols.
- Understand the costume and textile design of the Bodos.
- In-depth knowledge of different genres of Bodo folk literature.
- Understand the food processing system of the Bodos.
- Get details ideas on life writing and its types.

DEPARTMENT OF BODO

BISWANATH COLLEGE

COURSE SPECIFIC OUTCOMES (CBCS)

Biswanath College is an affiliated college of Gauhati University. Hence the college has to follow the course curriculum of the affiliating university. While designing the curriculum Gauhati University has mentioned some course outcomes. However, college experts have more outcomes from the course. Course-specific outcomes of Bodo Regular under CBCS has been summarized below.

Semester: I

BOD-RC-1016

Textual Analysis on Bodo Drama (Early Period)

- Students will come to know about the background of Bodo drama.
- Students will come to know about old-period Bodo drama.

BOD-AE-1014

Communicative Bodo

- To provide knowledge about the spelling system used in writing the Bodo language.
- To provide knowledge about the practical application of the Bodo language from different perspectives.
- To examine the use of Bodo language in print and electronic media, administrative terminology.

Semester: II

BOD-RC-2016

Non-fictional prose in Bodo

- Come to know about the development of non-fictional prose in early and modern periods.
- Can acquire knowledge about a few prose in Bodo.

Semester: III

BOD-CC-3016

Kamal Kumar Brahma

- To provide a comprehensive biography of Kamal Kumar Brahma, including his early life, education and the factors that influenced his career and contributions
- To explore and analyse Kamal Kumar Brahma's contributions to Bodo literature.
- To examine Brahma's role in the development and promotion of Bodo grammar and language standardization.
- To investigate Kamal Kumar Brahma's contribution in the Bodo film industry.

BOD-RC-3016

Bodo Drama

- To explore different types of drama in Bodo literature.
- To study the influence of Assamese and Bangla drama in Bodo literature.
- To analyse a few selected dramas in Bodo.

BOD-SE-3014

Translation Studies

- To know different types of translation.
- To know about the challenges of translation.
- To know about the importance of translation in News Item, Easy and Interview.
- To review on suitability and acceptability of the translated book "Wings of Fire" by Dr. A. P. J. Abdul Kalam.

Semester: IV

BOD-CC-4016

Nilkamal Brahma

- To know about the life and works of litterateur Nilkamal Brahma.
- To know about the literary contributions of Nilkamal Brahma in different genres of literature.
- To know his contribution to translation work.

BOD-RC-4016

Bodo Fiction

- To know about the selected Bodo novels.
- To know about selected Bodo short stories.

BOD-SE-4014

Manuscript Preparation

- To know about manuscript preparation and the use of punctuation and symbols.
- To know about the benefits of editing and taking into MS Word & PageMaker.

Semester: V

BOD-SE-5014

Costume and Textile Design of the Bodos

- To trace the historical evolution of Bodo costume and textile design from ancient tradition to contemporary styles.
- To explore the cultural significance of Bodo costumes and textiles.
- To describe the traditional textile production techniques employed by the Bodo community.
- To know the challenges facing Bodo costume and textile design.
- To assess the economic and cultural impact of Bodo textiles, including their role in generating income through craft and textile production.

BOD-RE-5016

Bodo Folk-Literature

- Come to know about Bodo folk literature and its sub-division.

- Come to know about different genres of Bodo folk literature.

BOD-RG-5016

Children Literature

- To know about the concept of Children literature.
- To provide a historical overview of Bodo children literature.
- To know about the development of children literature in Bodo.

Semester: VI

BOD-SE-6014

Food Processing System of the Bodos: Tradition to Modernity

- To know about the food processing system of the Bodos from past to present.
- To methods and types of Food Processing System.
- To know the impact of modern food processing system on food habits of the Bodos.

BOD-RE-6016

Life Writing in Bodo

- Come to know about life writing and its types.
- Come to know about biography and travel works in Bodo.

BOD-RG-6016

Dissertation Writing

- To enable students to get an idea about the research project by following all systematic steps of research.

Biswanath College

Department of English

ENGLISH CORE

PROGRAMME SPECIFIC OUTCOMES

PSO 1: Demonstrate essential knowledge and understanding of English literature in terms of its history, forms, locations, themes, contexts, and literary practices.

PSO 2: Apply critical understanding by engaging literary criticism to evaluate and examine diverse kinds of English writing.

PSO 3: Analyse, conceptualise and communicate ideas, theories, concepts and research related to literatures in English.

PSO 4: Evaluate global issues and multicultural perspectives, and integrate values, ethical practice and responsibility towards society and the environment.

Paper1
English CORE: Semester 1
English Literary and Social History
ENG010104

Objectives:

This paper is designed to introduce students to English literary and social history in terms of ideas and/or events that bear on the production of texts earmarked for study of the basics of English literature. Students will here be expected to familiarise themselves with the literary and social aspirations of English as revealed in its literature through the different periods and ages. Topics are broad and general enough to be readily manageable in the first semester and have been selected with a view to sensitising students to the vast panorama of socio-cultural changes across different ages.

Course Outcome

At the end of this course ,the students would be able to:

CO1: Outline and describe the chronology of English literary and social history

CO2: Summarise and analyse the contexts of English literature over different historical and social periods

CO3: Apply multiple reading processes in interpreting English literary and social history

CO4: Differentiate, distinguish and compare literary traits, genres, and practices in English literature from different historical periods.

CO5: Evaluate the impact of location, culture, texts and contexts in the growth of literary traditions in English literature

Paper2
English CORE: Semester2
Forms, Genres and Concepts of English Literature
ENG020104

Objectives:

This paper is designed to introduce students to the major forms, genres and concepts of English literature. Students will here be expected to familiarise themselves with the themes, ideas and different generic dimensionsof literary writing and practice. The topics are broad and general enough to be readily manageable in the second semester and have been selected with a view to enable students to connect and associate these concepts and forms with reference to texts and their specific contexts.

Course Outcome:

At the end of this course, the students would be able to:

CO1: Identify different types of writing and practice in English literature

CO2: Classify the genres and concepts of English literature over different historical periods

CO3: Apply knowledge of forms, genres and concepts in interpreting literary texts

CO4: Compare literary forms, genres, and concepts across different historical periods.

CO5: Evaluate the growth of various English literary traditions

Department of Education
Course Paper and Course code (2023-24)
FYUGP

1. **Semester:** 1st Semester (Major/Minor)
   Course Name: Principles of Education
   Course Code: 100-199
   Course Outcomes: After going through this paper the students will be
   - Able to know the meaning, types and sound principles of education.
   - Students will be able to get acquainted with the concepts like different aims of education , Curriculum , Democracy, discipline, Freedom, etc
   - Have knowledge about different aims of education and its application in educational setting.
   - Able to understand the democratic ideals and set up of education.

2. **Semester:** 2nd Semester (Major/Minor)
   Course Name: Educational Psychology
   Course Code: 100-199
   Course Outcomes: After completion of this course the students will be able to:
   - Understand the relationship between education and psychology.
   - Explain the need of educational psychology in teaching learning process.
   - Describe the nature and theories of learning and role of motivation in learning.
   - Understand the concept of memory, forgetting, attention and interest.
   - Understand intelligence, its theories and measurement and acquaint themselves with different types of personality and the adjustment mechanism.
   - Understand the types of exceptional children and significance of individual differences in a classroom.

Department of Education
Paper name and Paper code (2023-24)
CBCS

3. **Semester:** 3rd Semester (Honours)
   Paper Name: Development of Education in India-II
   Paper Code: EDU-HC-3016
   Course Outcomes: After completion of this course the learner will be able to:
   - Understand the Educational situation during the time of Independence
   - Explain the recommendations and educational importance of different Education Commission and Committees in post Independent India
   - Analyze the National Policy on Education in different tomes
   - Accustom with the recent Educational Development in India

4. Semester: 3rd Semester (Honours)

Paper Name: Educational Technology and Teaching Methods

Paper Code: EDU-HC-3026

Course outcomes: After completion of this course the learner will be able to:

- Make the students understand the objective of educational technology in teaching learning process
- Acquaint the students with innovations in the field of education through technology
- Make the students understand about various methods and devices of teaching
- Acquaint students with levels, effectives of teaching and classroom management
- Make the students understand the strategies of effective teaching as a profession.

5. Semester: 3rd Semester (Honours)

Paper Name: Value and Peace Education

Paper Code: EDU-HC-3036

Course outcomes: After completion of this course the learner will be able to:

- Become aware about the role of educational institutions in building a value based society.
- Understand the meaning and concept of peace and its importance in human life.
- Understand the meaning and importance of peace education and its relevance at national and international level.
- Identify the different issues/ challenges in imparting peace education.
- Identify the strategies and skills in promoting peace education at institutional level.

6. Semester: 3rd Semester (Regular)

Paper Name: Guidance and Counselling

Paper Code: EDU-HG/RC-3016

Course outcomes: After completion of this course the learner will be able to:

- Help the students to understand the concept, need and importance of Guidance and Counselling
- Enable the students to know the different types and approaches to Guidance and Counselling
- Acquaint the students with the organization of guidance service and school guidance clinic
- Enable the learners to understand the challenges faced by the teacher as guidance worker.

7. Semester: 3rd Semester (SEC)

Paper Name: Guidance and Counselling

Paper Code: EDU-SEC-3014

Course outcomes: After completing this course, students will be able to acquire the capacities of public speaking skill.

8. Semester: 4th Semester (Honours)
Paper Name: Great Educational Thinkers
Paper Code: EDU-HC-4016
Course outcomes: After completion of this course the learner will be able to:

- Enable the students to learn the Philosophy of life of different Educational Thinkers and their works.
- Enable the students to learn about the views of thinkers in educational context.
- Enable the students to learn about relevance of some of their thoughts at present day context.

9. Semester: 4th Semester (Honours)
Paper Name: Educational Statistics and Practical
Paper Code: EDU-HC-4026
Course outcomes: After completion of this course the learner will be able to:

- Develop the basic concept of Statistics,
- Be acquainted with different statistical procedures used in Education.
- Develop the ability to represent educational data through graphs.
- Familiarize the students about the Normal Probability Curve and its applications in Education.

10. **Semester:** 4th Semester (Honours)
Paper Name: Emerging Issues in Education
Paper Code: EDU-HC-4036
Course outcomes: After completion of this course the learner will be able to:

- Make the students acquaint with major emerging issues national, state, and local
- Acquaint the students with the various issues in education that are emerging in the recent years in the higher education system
- Address the various problems and challenges of education in India at all levels.

11. **Semester:** 4th Semester (Regular)
Paper Name: History of Education in India
Paper Code: EDU-HG/RC-4016
Course outcomes: After completion of this course the learner will be able to:

- Analyse the education system during British Period
- Understand the Educational situation during the time of Independence
- Explain the recommendations and educational importance of different Education Commission and Committees in post Independent India
- Analyse the National Policy on Education in different tomes
- Accustom with the recent Educational Development in India.

12. Semester: 4th Semester (SEC)

Paper Name: Writing Bio-data and facing an interview

Paper Code: EDU-SEC-4014

Course outcomes: After completing this course, students will be able to write a bio-data scientifically and will develop confidence to face different types of interview.

13. Semester: 5th Semester (Honours)

Paper Name: Measurement and Evaluation in Education & Practical

Paper Code: EDU-HC-5016

Course outcomes: After completion of this course the learner will be able to:

- Enable the students to understand the concept of measurement and evaluation in education.
- Acquaint the students with the general procedure of test construction and characteristics of a good test.
- Develop an understanding of different types of educational tests and their uses.
- Acquaint the students about personality test, and aptitude tests.

14. Semester: 5th Semester (Honours)

Paper Name: Guidance and Counselling

Paper Code: EDU-HC-5026

Course outcomes: After completion of this course the learner will be able to:

- Help the students to understand the concept, need and importance of Guidance and Counselling
- Enable the students to know the different types and approaches to Guidance and Counselling
- Acquaint the students with the organization of guidance service and school guidance clinic
- Enable the learners to understand the challenges faced by the teacher as guidance worker.

15. **Semester:** 5th Semester (Honours)

Paper Name: Developmental Psychology

Paper Code: EDU-HE-5026

Course outcomes: After completion of this course the learner will be able to:

- Enable the students to understand the basic concepts relating to development
- Acquaint the students about heredity and environmental factors affecting pre-natal development
- Enable the students to understand the development aspects during infancy and childhood
- Enable the students to understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage.

16. Semester: 5th Semester (Honours)
Paper Name: Teacher Education in India
Paper Code: EDU-HE-5046
Course outcomes: After completion of this course the learner will be able to:

- Explain the Concept, Scope, Aims & Objectives and Significance of teacher education
- Acquaint with the development of Teacher Education in India
- Acquaint with the different organizing bodies of teacher education in India and their functions in preparation of teachers for different levels of education
- Acquaint with the innovative trends and recent issues in teacher education, and be able to critically analyze the status of teacher education in India
- Understand and conceive the qualities, responsibilities and professional ethics of teachers

17. Semester: 5th Semester (Regular)
Paper Name: Developmental Psychology
Paper Code: EDU-RE-5026
Course outcomes: After completion of this course the learner will be able to:

- Enable the students to understand the basic concepts relating to development
- Acquaint the students about heredity and environmental factors affecting pre-natal development
- Enable the students to understand the development aspects during infancy and childhood
- Enable the students to understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage.

18. **Semester:** 5th Semester (SEC)
Paper Name: Extension Activities
Paper Code: EDU-SEC-5014
Course outcomes: After completing this course, students will be able to do extension activities.

19. **Semester:** 6th Semester (Honours)
Paper Name: Education and Development
Paper Code: EDU-HC-6016
Course outcomes: After completion of this course the learner will be able to:

- Relation between education and development
- Educational development in the post globalization era
- Role of education in community development
- Education for human resource development
- Economic and political awareness through education

20. **Semester:** 6th Semester (Honours)
Paper Name: Project
Paper Code: EDU-HC-6026
Course outcomes: After completion of this course the learner will be able to:

- Explain the process of conducting a Project.
- Prepare a Project Report.

21. **Semester:** 6th Semester (Honours)
Paper Name: Mental Health and Hygiene
Paper Code: EDU-HE-6016
Course outcomes: After completion of this course the learner will be able to:

- Acquaint with the fundamentals and development of mental health and the characteristics of a mentally healthy person.
- Understand the concept and importance of mental hygiene and its relationship with mental health.
- Acquire knowledge about the principles, factors promoting mental health and the role of home, school, and society in maintaining proper mental health.
- Learn the meaning and problem of adjustment and also the different adjustment mechanisms.
- Familiarize with the concept and issues of positive psychology, mental health of women, role of WHO and stress management.

22. Semester: 6th Semester (Honours)
Paper Name: Educational Management
Paper Code: EDU-HE-6036
Course outcomes: After completion of this course the learner will be able to:

- Develop an understanding of the basic concept of educational management.
- Enable the students to know about the various resources in education
- Enable the students to understand the concept and importance of educational planning.
- Enable the students to know about the financial resources and financial management in education.

23. Semester: 6th Semester (Regular)
Paper Name: Mental Health and Hygiene
Paper Code: EDU-RE-6016
Course outcomes: After completion of this course the learner will be able to:

- Acquaint with the fundamentals and development of mental health and the characteristics of a mentally healthy person.

• Understand the concept and importance of mental hygiene and its relationship with mental health.
• Acquire knowledge about the principles, factors promoting mental health and the role of home, school, and society in maintaining proper mental health.
• Learn the meaning and problem of adjustment and also the different adjustment mechanisms.
• Familiarize with the concept and issues of positive psychology, mental health of women, role of WHO and stress management.

24. Semester: 6th Semester (SEC)

Paper Name: Developing Teaching Skill

Paper Code: EDU-SEC-6014

Course outcomes: After completing this course, students will be able to develop understanding about different teaching skills which are used in classroom transaction.

BISWANATH COLLEGE (GAUHATI UNIVERSITY)

COMMERCE DEPARTMENT

PROGRAM OUTCOME (POs) for B.Com 2nd, 4th (FYUGP) and 6th (CBCS) SEMESTER

B.COM 2nd SEMESTER (FYUGP)

DEPARTMENT	COMMERCE
COURSE	B.COM 2nd SEMESTER
COURSE CODE	COURSE NAME
COM -151	Corporate Accounting
COM-152	Principles & Practice of Management
COM- 153	Principles of Marketing

After successfully completing the B.Com 2nd Semester, students will be able to:

1. **Apply Marketing Principles –** Demonstrate an understanding of fundamental marketing concepts, consumer behavior, market segmentation, and digital marketing strategies.

2. Develop Managerial Competence – Apply management principles such as planning, organizing, staffing, leadership, and decision-making in business scenarios.

3. Analyze Corporate Financial Data – Interpret and prepare corporate financial statements, including share capital, debenture accounting, and corporate restructuring.

4. Make Informed Business Decisions – Use management and marketing knowledge to analyze business challenges and develop effective solutions.

5. Understand Ethical and Legal Aspects – Recognize ethical issues in marketing, management, and corporate accounting, ensuring compliance with corporate governance norms.

6. Enhance Problem-Solving and Analytical Skills – Apply logical reasoning and financial analysis to solve real-world business and accounting problems.

7. Communicate Effectively in Business – Develop written and verbal communication skills required for business presentations, reports, and negotiations.

8. Adapt to Technological Changes in Business – Utilize digital marketing techniques, accounting software, and modern management tools for business operations.

9. Develop Entrepreneurial and Leadership Abilities – Cultivate leadership skills and entrepreneurial thinking to manage business ventures effectively.

10. Prepare for Advanced Learning – Build a strong foundation for higher studies marketing, management, accounting, and finance.

These Program Outcomes (POs) integrate key knowledge and skills gained from Principles of Marketing, Principles and Practice of Management, and Corporate Accounting, ensuring holistic business education and career readiness.

B.COM 4TH SEMESTER (FYUGP) PO:-Program Outcomes (POs)

	B. COM 4TH SEMESTER
All majors	COM-251 Fundamentals of Financial Management
Major in Finance, HRM, & MM	1. Direct & Indirect Tax COM-252 2. Cost & Management Accounting COM-253
Major in Accountancy & Finance	1. COM-254 2. Financial Market Operations
Major in Accountancy	COM-255 Income Tax Laws & Practices COM-256 Cost Accounting COM-257 Advanced Corporate Accounting
Major in Finance	COM-258 Insurance
Major in HRM	COM-259 Labour Laws
	COM-260 Industrial Relations
Major in MM	COM-261 Retail Management COM-262 Customer Relationship Management

After successfully completing the B.Com 4th Semester,students will be able to:

1. Apply Financial Management Principles – Understand and apply financial decision-making techniques, including capital budgeting, risk assessment, and working capital management.

2. Analyze Direct & Indirect Taxation – Gain knowledge of income tax laws, GST, and other indirect taxes, and apply tax planning strategies for individuals and businesses.

3. Develop Cost & Management Accounting Skills – Apply cost accounting methods for cost control, budgeting, and decision-making in business operations.

4. Understand Financial Market Operations – Analyze the structure, functioning, and regulatory framework of financial markets, including stock exchanges and capital markets.

5. Implement Income Tax Laws & Practices – Compute taxable income, understand tax deductions, and file income tax returns in compliance with legal provisions.

6. Master Advanced Corporate Accounting – Handle complex accounting topics such as amalgamation, reconstruction, valuation of shares, and liquidation of companies.

7. Understand Insurance Principles – Gain knowledge about life, health, and general insurance policies, risk assessment, and the role of insurance in financial planning.

8. Apply Labour Laws in Business – Understand and apply laws related to wages, working conditions, industrial disputes, and employee welfare in business operations.

9. Analyze Industrial Relations – Examine employer-employee relationships, trade unions, collective bargaining, and conflict resolution mechanisms in industrial settings.

10. Develop Retail Management Skills – Understand retail operations, consumer behavior, supply chain management, and strategies to enhance customer experience.

11. Enhance Customer Relationship Management (CRM) Skills – Implement CRM strategies to improve customer satisfaction, loyalty, and business growth.

12. Integrate Accounting and Financial Knowledge with Technology – Use modern accounting software, financial tools, and CRM applications for efficient business management.

13. Improve Analytical and Decision-Making Abilities – Utilize financial, accounting, and taxation knowledge to make data-driven business decisions.

14. Promote Ethical and Sustainable Business Practices – Develop awareness of ethical business practices, corporate social responsibility (CSR), and sustainable financial management.

15. Prepare for Professional Certifications and Careers – Build a strong foundation for careers in accounting, taxation, finance, banking, and corporate management or pursue professional certifications like CA, CMA, CS, and CFA.

These Program Outcomes (POs) ensure that students acquire technical knowledge, analytical skills, and managerial abilities to excel in commerce and finance-related careers.

B.COM 6TH SEMESTER (CBCS) PROGRAM OUTCOME:-

Semester VI		
COM-HC-6016	Auditing and Corporate Governance	**Core Course C-13**
COM-HC-6026	Indirect Tax Laws	**Core Course C-14**
	DSE-3 (*Any one of Group B other than the subject selected under DSE-4*)	**Discipline Specific Elective (DSE)-3**
	DSE-4 (*Any one of Group B other than the subject selected under DSE-3*)	**Discipline Specific Elective (DSE)-4**
	Discipline Specific Elective (DSE) Group B	
COM-DSE- HC-6036 (A)	Fundamentals of Investment	
COM-DSE- HC-6036 (B)	Consumer Affairs and Customer Care	
COM-DSE- HC-6036 (C)	Advanced Corporate Accounting	
COM-DSE- HC-6036 (D)	International Business	
COM-DSE- HC-6036 (E)	Industrial Relations and Labour Laws	
COM-DSE- HC-6036 (F)	Business Research Methods and Project Work	

(Auditing & Corporate Governance, Indirect Tax, Consumer Affairs & Customer Care, International Business)

After successfully completing these subjects, students will be able to:

1. **Understand the Principles of Auditing – Explain the fundamental concepts, types, and procedures of auditing, ensuring accuracy and compliance in financial statements.**
2. **Apply Corporate Governance Practices – Analyze corporate ethics, transparency, and governance mechanisms to ensure accountability and stakeholder protection in business operations.**
3. **Analyze Indirect Taxation Laws – Gain knowledge of GST, Customs Duty, and other indirect taxes, and understand their impact on businesses and the economy.**

4. **Compute GST & Tax Liabilities – Learn the GST registration process, input tax credit, tax returns filing, and compliance requirements.**
5. **Develop Consumer Protection Awareness – Understand consumer rights, responsibilities, and redressal mechanisms under the Consumer Protection Act.**
6. **Apply Customer Care Strategies – Implement customer relationship management (CRM) strategies to enhance customer satisfaction, loyalty, and service quality.**
7. **Understand International Business Concepts – Analyze global trade policies, foreign exchange regulations, and strategies for international market entry.**
8. **Evaluate Global Trade Practices – Study trade agreements, WTO policies, and cross-border trade regulations affecting international businesses.**
9. **Enhance Problem-Solving & Decision-Making Skills – Apply taxation, auditing, and consumer protection knowledge to solve real-world business challenges.**
10. **Develop Ethical and Legal Business Understanding – Recognize corporate social responsibility (CSR), ethical business practices, and legal compliance in taxation, auditing, and governance.**
11. **Use Technology in Business Operations – Utilize modern tools for tax filing, auditing software, and CRM applications to improve business efficiency.**
12. **Prepare for Professional Growth & Higher Studies – Build a strong foundation for careers in finance, taxation, auditing, international trade, and corporate management or pursue certifications like CA, CS, CMA, or ACCA.**

13. These Program Outcomes (POs) ensure that students gain theoretical knowledge and practical skills to navigate taxation, auditing, consumer affairs, and international business successfully.

COURSE OUTCOME

B.COM (CBCS)

Subject Code	Subject		Course Outcome
Semester I			
BCM-AE-1014	Business Communication (English/Hindi/MIL)		• The objective ies in preparing the students for better communicative ski ls through vocabulary bu ld ng and written correspondences. • Secondarily to equip the students with enhanced communicative mediums through new technologies • To boost the confidence among students through practical lessons on Presentation, Group Discussion, Personal Interview etc.
	Business Communication (Assamese)		• From this book the students are expected to learn about the modern technology such as Power Point, Emails, Correspondence through letters, internet and also how to publish their own writings in public newspapers. The students are facilitated the same through the book prescribed for them.
	Business Communication (ML)		• To equip students with the effective faculties of reading, writing, comprehension and communication • Secondarily to equip the students with enhanced communicative mediums through new technologies
COM-HC-1026	Financial Accounting		• Acquire conceptual knowledge of financial accounting • Learn about accounting information, accounting principles and the use of accounting standard • Understand the theory of measurement of Business Income • Learn Computerised accounting system with practical application of Tally-ERP 9 • Learn the procedure of preparation of Final Accounts • Learn the concept of Hire-Purchase, Installment Payment System and Branch Account

COM-HC-1036	BusinessLaw		•Impart basic knowledge of the important business legislation along with relevant caselaw.
COM-GE-1046(A)	Micro Economics		•CO1: To understand the consumer buying behaviour and their process of decision making to create demand •CO2: To understand the supply side of the market and producers' equilibrium through cost and revenue.
COM-GE-1046(B)	Investing in Stock Markets		•Provide basic skills to operate in stock markets and the ways of investing in it •Enable the student to take up investment in stock markets independently.
SemesterII			
ENV-AE-2014	Environmental Studies		•To provide the knowledge of environment education, its importance and various environmental related issues •To make aware of students for various environmental effects and social responsibilities for protection and reservation of natural resources.
COM-HC-2026	Corporate Accounting		•Acquire conceptual knowledge of Corporate Accounting and learnabout the process of preparation of Final accounts ofJoint Stock Company (as per Companies Act, 2013) •Learn about the concept and methods of valuation of Goodwilland Shares • Learn about the concepts andaccounting • treatment of Right Shares, Bonus Shares and Buy Back of Shares • Learn the basic concepts of Holding Company as per Companies Act and Accounting Standards and preparation of Consolidated Balance Sheet.
COM-HC-2036	Corporate Laws		• Impart basic knowledge of the provisions of the Companies Act 2013 • Impart basic knowledge of the provisions of the Depositories Act, 1996. • Impart knowledge on practical aspects through case studies involving issues in corporatelaws.
COM-GE-2046(A)	Macro Economics		•CO1: To provide basic knowledge of macroeconomic variables. •CO2: To understand the working of the variables in determining equilibrium of the economy.

			•CO3: To understand the policy framework of the economy in the light of open economy
COM-GE-2046(B)	Insurance & Risk Management		•Develop an understanding among students about identifying analyzing and managing various types of risk. •Understand principles of insurance and its usefulness in business. • Impart knowledge on regulatory framework.
Semester III			
COM-HC-3016	Computer Applications in Business		•To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations •To enable the students familiar with the practical applications for preparing business information.
COM-HC-3026	Income-tax Law and Practice		•Acquire basic knowledge and equip themselves with application of principles of Income Tax Act 1961 and the relevant rules •Learn to compute taxable income under different heads of income • Learn the computation of income tax liability and deduction available • Learn to file Income Tax Return electronically
COM-HC-3036	Management Principles and Applications		•Gain knowledge of the principles and practices of management techniques •Understand the various managerial functions in detail. • Apply principles of management in real business environment.
COM-GE-3046 (A)	Business Statistics/		•To provide knowledge to students about the basic statistical tools that are used in business and commerce and thus provide them with an expertise in managerial decision making so as to effectively handle statistical data vis-a-vis the application of these tools
COM-GE-3046 (B)	Operation Research in Business		•To Provide knowledge to the learners in the field of decision making, Queuing Theory, replacement techniques and reliability so as to equip them for business forecasting and decision making

COM-SEC-HC-3054 (A)	Entrepreneurship/		•Comprehend the role of entrepreneurship in social-economic development at local, state, national and global level. •Evaluate the necessary techniques and formalities involved in building start ups •Develop an entrepreneurial mindset and zeal to pursue entrepreneurship as a profession and reap the benefits of self employment
COM-SEC-HC-3054 (B)	New Venture Planning		•Understand the process of identifying new business opportunities, researching and developing a business concept and analyzing the resources and strategies necessary to implement •Learn about startups and how new ventures can be fruitfully operated
Semester IV			
COM-HC-4016	Cost Accounting		• To acquaint with the basic concepts used in cost accounting • Learn about various elements of cost like Materials, Labour and Overheads •Learn the concept and calculation of cost in special situation like Job Costing, Contract Costing and Process Costing •Acquire knowledge of Integral and Non-Integral System
COM-HC-4026	Business Mathematics		•To provide the learners with the basic knowledge of mathematical tools so as to familiarise them with the application of these tools in business and economic situations
COM-HC-4036	Human Resource Management		• Gain knowledge of the processes to apply Human Resource Management Principles and techniques in dealing with human capital in organizations • Understand emerging challenges of HRM, methods of acquiring human resource, training them and measuring their performances • Learn issues related to Voluntary Retirement Scheme (VRS), downsizing, fringe benefits, HRIS, HRA, social security, employee welfare and ethics in HRM.
COM-GE-4046 (A)	Indian Economy		•CO1: To give a clear picture of the major problems of Indian economy and their solutions. •CO2: To understand the history of growth

			and development of the economy . •CO3: To understand reforms introduced . •CO4: To inculcate spirit of entrepreneurship
COM-GE-4046 (B)	Micro Finance		•Make the students understand the basic concepts of micro-finance and its importance. •Develop understanding about the institutional structure of microfinance in India • Develop understanding about the management of micro-finance institutions •Impart knowledge about microfinance in Indian context.
COM-SEC-HC-4054 (A)	E-Commerce		•To provide knowledge about various e-commerce tools, techniques, security issues for conducting business transactions through electronic means . •To Provide practical skills for online transaction, e-payment and web designing methods etc.
COM-SEC-HC-4054 (B)	E-Filing of Returns		• Acquire concepts and practical knowledge about E-filling of Returns • Learn how to register on Income Tax E/filling Website and file various Income Tax returns • Learn about the concept of TDS and E-filling of TDS returns • Acquire the knowledge about the relevant notification regarding E-filling of GST returns and the process of filling the same.
Semester V			
COM-HC-5016	Principles of Marketing		•Gain basic knowledge of concepts, principles, tools and techniques of marketing •Understand about marketing mix components, consumer behavior, market segmentation, consumerism and •Apply the learnt concepts in the context of recent developments in marketing.
COM-HC-5026	Fundamentals of Financial Management		•Familiarize the students with the principles and practices of financial management.
COM-DSE-HC-5036 (A)	Management Accounting		•Acquire conceptual knowledge of various tools and techniques of Management

			Accounting •Development of Managerial decision making skill •Learn the preparations of various budgets required in a business organisation •Acquire the knowledge of Standard Costing and variance analysis
COM-DSE- HC-5036 (B)	Advanced Financial Accounting		• Advanced knowledge on Financial Accounting applicable in Business of special nature and on Government Accounting • Learn the accounting treatment for preparation of Royalty Accounts • Acquire the knowledge of Insurance claim and Departmental accounts • Learn the accounting treatment of Amalgamation and dissolution of Partnership firm
COM-DSE- HC-5036 (C)	Advertising		•Acquire knowledge of the basic concepts of advertising as a promotional tool and medium of communication. •Understand major media types, developing advertising appeals and measuring advertising effectiveness in view of social, ethical and legal aspects of advertising in India.
COM-DSE- HC-5036 (D)	Banking		•Provide knowledge of Banking principles, procedures and techniques in accordance with current legal requirements and professional standards.
COM-DSE- HC-5036 (E)	Computerised Accounting System		•Provide skills for designing Computer based accounting system
COM-DSE- HC-5036 (F)	Indian FinancialSystem		• Provide students the basic knowledge of Indian Financial System and its components, institutions and their functions.
Semester VI			
COM-HC-6016	Auditing and Corporate Governance		• Acquire knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards • Acquire knowledge of conducting audit of Limited Company • Learn about Cost audit , Tax audit and Management audit • Get an overview of the principles of Corporate Governance and Corporate

			Social Responsibility
COM-HC-6026	Indirect Tax Laws		• Acquire the basic knowledge of Indirect Tax Laws • Learn various provisions of Central Excise and Custom Laws • Acquire knowledge about the structure of GST in India • Learn the procedure of registration, levy and collection of Tax under GST.
COM-DSE- HC-6036 (A)	Fundamentals of Investment		• Familiarize the students with different investment alternatives • Introduce students to the framework of investment analysis and valuation • Highlight the role of investor protection
COM-DSE- HC-6036 (B)	Consumer Affairs and Customer Care		• Know their rights as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights. • Understand the procedure of redressal of consumer complaints and the role of different agencies in establishing product and service standards • Comprehend the business firm's interface with consumers and the consumer related regulatory and business environment.
COM-DSE- HC-6036 (C)	Advanced Corporate Accounting		• Acquire conceptual knowledge of accounting standards • Learn about Corporate Annual Reports – its contents and Provisions • Learn about the preparation of Liquidators Final Statement of Accounts • Learn about the preparation of accounts of Banking and Insurance Companies
COM-DSE- HC-6036 (D)	International Business		• Familiarize the students with the concepts, importance and dynamics of international business • Highlight India's involvement with global business. • Theoretical foundations of international business to the extent these are relevant to the global business operations and developments
COM-DSE- HC-6036 (E)	Industrial Relations and Labour Laws		• Learn the concept of employer-employee relations discipline, collective bargaining, workers participation in management, arbitration, adjudication and negotiations to manage industrial disputes and

			conflicts •Evaluate the different labour laws related to trade unions, industrial disputes, provisions relating to health, safety, welfare measure and working hours in factories
COM-DSE- HC-6036 (F)	Business Research Methods and Project Work		• Learn Research Methodology • Demonstrate innovative thinking/ideas for future applications • Orient the students for research work • Acquire practical experience of Field Survey

B.COM (FYUGP)

Semester1

BCM0100204	FINANCIAL ACCOINTING		•Acquire conceptual knowledge of financial accounting • Learn about accounting information, accounting principles and the use of accounting standard • understand the theory of measurement of business income • learn the procedure of preparation of final accounts • learn computer accounting system
BCM0100104	BUSINESS ORGAINSATION AND MANAGEMENT		•Acquire conceptual knowledge of nature and concept of business, factors to be considered for starting a business • Learn about forms of business organization, business formats-Brick & Mortar, E-commerce, Franchising •Learn about planning and organization, centralization and decentralization, delegation facts
BCM0100304	INDIAN FINANCIAL SYSTEM		•Provide students the basic knowledge of Indian Financial System and its components, institutions and their functions

Semester 2			
BCM0200104	CORPORATE ACCOUNTING		• Acquire conceptual knowledge of corporate accounting and learn about the process of preparation of final accounts of joint stock company • Learn about the concept and methods of valuation of goodwill and shares • understand the treatment of right shares, bonus shares and buy back of shares • learn the basic concepts of holding company and preparation of consolidated balance sheet
BCM0200304	PRINCIPLE OF MARKETING		• Acquire knowledge of concepts, principles, tools and techniques of marketing • Learn about marketing mix components, consumer behavior, market segmentation and consumerism • Apply the learn concepts in the context of recent developments in marketing
BCM0200204	PRINCIPLES AND PRACTICE OF MANAGEMENT		• apply management principles and theories in practical situations • demonstrate effective leadership skills. • Analyze and solve management problems • learn about organizational objective setting, decision making environments, motivation theories

DEPARTMENT OF PHILOSOPHY

BISWANATH COLLEGE

Program outcomes, program specific outcomes and course outcomes for Philosophy

The BA Philosophy honours course is designed by the affiliating University under choice-based semester system has been taught in this college since the academic session 2019. The philosophy honours syllabus includes two major areas- Philosophy and Logic. The philosophy part includes history of both Indian and western philosophy, their natures, different philosophical concepts of different philosophers. Again the Logic part familiarizes the students with the basic logical concepts like proposition, term, hypothesis, logical arguments etc. The objectives of the program have been summed up below.

1. The primary goal of philosophy course is to address some of those ultimate questions so as to enable students to lead a more substantive and meaningful life and have a reasoned foundations conducive to support for human values; to an awareness of a duty to work for justice, compassion, and peace; and to the integrated and rich human life worth living.
2. providing students the abilities and opportunities to be more responsible for the interdependent world in which they find themselves.
3. The Philosophy program seeks to promote the development of the person as an individual and as a meaningful contributor to the society.
4. Moreover, philosophical training is intrinsically as well as extrinsically valuable. It seeks to enhance in students the skills they need to develop, establish, reconstruct, and evaluate arguments in any field. Philosophical training also helps students seek general explanatory principles, reflect upon what really matters, look for alternatives to widely accepted views, and learn to distinguish what is significant from what is not.

SEMESTER I (HC)

PAPER PHI-HC- 1016 INDIAN PHILOSOPHY -I

This paper aims to acquaint students with the ancient Indian Texts-Vedas,Upanisads and Bhagavadgita-their meanings and different divisions etc. It also intends to acquaint students with the development of Indian Philosophy-its nature, scope and characteristics, different schools of Indian Philosophical system.

PAPER PHI-HC- 1026 LOGIC-I

It aims to acquaint the students with the basic logical concepts like proposition, argument, syllogism, Venn diagram, concept of set etc. this will enable the students to think logically in their day-to-day lives. Students will be acquainted with the development of symbolic logic from its traditional form, the uses of symbols in logic, the concept of variables and constant, types of logical connectives, the concept of truth table and truth function, construction of truth table

SEMESTER I (RC)

PAPER PHI-RC-1016 GENERAL PHILOSOPHY

This paper acquaints the students with the general nature of philosophy, its scope, branches, different approaches to knowledge like rationalism, empiricism, criticism etc. This helps them to understand what philosophy is as a whole.

SEMESTER II (HC)

PAPER PHI-HC-2016 GREEK PHILOSOPHY

This paper enables the students to have basic ideas of ancient Greek philosophy. This paper includes the philosophies of Thales, Anaximender, Heraclitus, Socrates, Plato, Aristotle etc. Students can know the beginning of philosophy here.

PAPER PHI-HC-2026 LOGIC II

Logic II paper enables the students to be acquainted with symbolic logic in details. Here they can learn logical constants, variables, truth table, formal proof of validity etc. This will help them to find the validity or invalidity of any given argument.

SEMESTER II (RC)

PAPER-PHI-RC-2016 INDIAN PHILOSOPHY

This paper includes the meaning, nature and different schools of Indian philosophy. There are two major schools of Indian philosophy Astika and Nastika. Carvaka, Buddha and Jaina are the

three Nastika schools. Here the students read the philosophies of carvaka, Budhha and Jaina. He will come to know that Indian philosophy is not wholly spiritual in nature. It has given importance on our practical lives too.

Semester III (HC)

PAPER PHI-HC- 3016 WESTERN PHILOSOPHY- DESCARTES TO HEGEL

This paper includes the basic philosophies of rationalism and empiricism. This paper aims to acquaint students with the Rationalists philosophers and the Empiricists philosophers and their philosophical doctrines. Here students get Descartes' method of doubt, mind-body dualism, Spinoza's substance, Leibnitz' Monadology and Pre-established Harmony. Again Locke's criticism of innate ideas, primary and secondary qualities, his theory of substance, Kant's concept of space and time ,categories, Hegel's dialectical method and Absolute Idealism are also included in this paper.

PAPER PHI-HC- 3026 INDIAN PHILOSOPHY II

Aims to acquaint students with the Vedic or Astika schools of Indian Philosophy and their different philosophical theories. Doctrine of Purusa and Prakrti, theory of Satkaryavada of Sankhya, concept of perception and inference of Nyaya, Vaisesika's seven categories(padarthas) and its atomic theory, Mimamsa's pramanas etc. are taught in this paper. It also aims to acquaint students with Sankara and Ramanuja's philosophy of Brahman,Atman etc. And also Sankaradeva's philosophy of God and Bhakti.

PAPER PHI-HC- 3036 ETHICS

This course seeks to acquaint students This course seeks to acquaint students with the meaning, nature and scope of Ethics and the relationship of Ethics with other disciplines of study, object of moral judgement and moral obligations, the postulates of morality, concept of deontological and teleological ethics virtue ethics of Aristotle, Kant's deontological ethics, utilitarianism of Mill and Bentham, different theories of Punishment, the concept of professional ethics and environmental ethics, and the study of the law of karma, varna-asrama dharma, Buddhists pancasila, Jaina's Triratna and its other related topics

PAPER-PHI-RC-3016 ETHICS

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SEMESTER-IV (HC)

PAPER-PHI-HC-4016CONTEMPORARY INDIAN PHILOSOPHY

The course outcome is to make students aware about the philosophical thoughts of different Contemporary Indian Philosophers such as Aurobindo, Radhakrishanan, Gandhi and Vivekananda

PAPER PHI-HC- 4026 PHILOSOPHY OF RELIGION

The course outcome is to understand the critical examination of religion and to understand contemporary challenges to religion

PAPER-PHI-HC-4036 POLITICAL AND SOCIAL PHILOSOPHY

The course outcome is to understand the present day situation of society and politics and the different challenges of the present society.

SEMESTER-IV (RC)

PAPER- PHI-RC-4016 LOGIC

This paper includes fundamental concepts of Logic like proposition ,argument, truth and validity, symbolic logic etc. This paper enables the students to understand validity or invalidity of any argument and can use them in their day-to-day lives.

SEMESTER-V (HC)

PAPER-PHI-HC -5016 ANALYTIC PHILOSOPHY

The course aims to acquaint students with the analytic philosophy of Moore, Russell,Wittgenstein and their major philosophical theories.

PAPER-PHI-HC-5026 PHENOMENOLOGY AND EXISTENTIALISM

The course aims to have an understanding of the phenomenological and existential theories of Kierkegaard,Sarte,Heidegger and Husserl.

PAPER-PHI-HE-5016 PHILOSOPHY OF UPANISHADS

The course aims to have an understanding of the principal Upanishads such as Isa, Kena, Manduka, Mandukya, Katha, Brihadarnyaka Upanishads etc.

PAPER-PHI-HE-5026 PHILOSOPHY OF GITA

This paper aims to acquaint the students with the philosophical ideas of Gita such as Niskama-karma, concept of God, concept of world, theory of incarnation, relation between God and the world, relation between God and soul etc. It enhances in the students the capacity of living a spiritual but realistic life.

SEMESTER-V (RC)

PAPER PHI-RE-5016 CONTEMPORARY INDIAN PHILOSOPHY

The course outcome is to make students aware about the philosophical thoughts of different Contemporary Indian Philosophers such as Aurobindo, Radhakrishanan, Gandhi and Vivekananda

PAPER PHI-RE-5026 WESTERN PHILOSOPHY

This paper includes the philosophies of the great rationalists and empericists philosophers like plato , Descartes, Hegel, Spinoza Jhon Loke, David Hume etc. Reading of this paper helps the students to understand different approaches of knowledge in Western Philosophy.

PAPER PHI-GE-5016 INDIAN YOGIC TRADITION

This paper aims to acquaint the students with the ancient Indian Yoga, its meaning, nature, benefits etc. This helps the students to live a stress-free live.

SEMESTER-VI

PAPER-PHI-HC-6016 PHILOSOPHY OF MIND

This paper aims to acquaint the students with basic philosophy of mind, its various aspects, concept of memory, personal identity , various theories of mind-body relation etc.

PAPER-PHI-HC-6026 META ETHICS

Here students are enabled to grasp the ethical terms on linguistic basis. Instead of learning the basic ethical ideas they can learn here the meaning, nature of the ethical terms like Good, Bad, Ought etc.

PAPER-PHI-HE-6016 PHILOSOPHY OF LANGUAGE

This paper helps the students to study philosophical language.

PAPER-PHI-HE-6026 APPLIED ETHICS

Here the students can learn ethics as a practical discipline. This paper includes environmental ethics, medical ethics etc. Students can know that other living beings are our integral companion and it is our duty to protect them. This helps us to protect our environment.

SEMESTER VI (RC)

PAPER PHI-RE-6016 PHILOSOPHY OF RELIGION

The course outcome is to understand the critical examination of religion and to understand contemporary challenges to religion

PAPER PHI-RE-6026 POLITICAL AND SOCIAL PHILOSOPHY

The course outcome is to understand the present day situation of society and politics and the different challenges of the present society.

PAPER PHI-GE-6016 PHILOSOPHY OF RELIGION

This paper includes basic religious concepts like faith, God, soul, immortality, arguments for existence of god, relation of God and the world etc. The course outcome is to understand the existence of God with its relation to the soul and the world.

NEP-FYUGP

Semester: I

Paper -ANCIENT INDIAN THOUGHT. Course Level: 100-199

This paper includes both Vedic and Non-Vedic thoughts, basic doctrines of Puranas, Ramayana and Mahabharata.

i. **Course Objectives** : -The Course introduces the students to thoughts which were available in ancient India. -The Course introduces the ideas and concepts which helped systems of Indian Philosophy to develop. -The Course introduces the students to the objectives towards which knowledge was directed in ancient India.

ii. **Learning Outcomes**: - At the completion of the Course, a student is expected to be able to articulate the distinct areas of thoughts of ancient India. - At the completion of the Course, a student is expected to be able to determine the characteristics/ distinguishing marks of a specific area of thought in ancient India. - At the completion of the Course, a student is expected to be able to identify/ trace ideas of ancient India that have continued.

SEMESTER II

Paper- GREEK PHILOSOPHY. PHI-HC-2016 Course Level: 100-199

This paper includes ancient Greek philosophy. Philosophical theories of the sophists, Socrates, Plato and Aristotle are included in this paper.

i. Course Objectives : -The objective of the course is to introduce the student to the main tenets of Greek philosophy. -The objective is to trace the origin of Greek philosophy, beginning from Pre-Socratic to Socrates, Plato and Aristotle.

ii. Learning outcomes: - It will give the students a comprehensive understanding of early Greek Philosophy. - -The student will learn about the questions concerning virtue, justice, theory of forms, and causality. -The student will learn about the different philosophical theories about the composition of the stuff that makes up the world.

Semester-III

Paper-INTRODUCTION TO SYSTEMS OF INDIAN PHILOSOPHY. Course Level: 200-299 .

This paper includes ancient Indian philosophy . The philosophical doctrines of Buddha, Jaina, Sankhya, Yoga , Nyaya , Vaisesika are discussed here.

i. Course Objectives : -The Course introduces the students to systems of Philosophy which developed in India before the widespread influence of outside thoughts. -The Course introduces the students to the books and scholars need to be studied to have a proper understanding of the systems. - The Course introduces the students to the basic ideas and thoughts of each specific system.

ii. Learning outcomes: -At the completion of the Course, a student is expected to be able to name the systems of philosophy that originated in India before outside influence became prevalent. - At the completion of the Course, a student is expected to be able to identify the books and scholars to be studied to develop an understanding of a definite system of Indian Philosophy. -At the completion of the Course, a student is expected to be able to state the basic concepts and theories that are specific to a system.