



OFFICE OF THE PRINCIPAL
PUB-KAMRUP COLLEGE

P.O.- BAIHATA CHARIALI
DIST.- KAMRUP (ASSAM), PIN- 781381
E-mail : principal@pubkamrupcollege.org

Phone : 03621-286300

PROGRAMME OUTCOME AND COURSE
OUTCOME (NON-CBCS) OF PUB KAMRUP
COLLEGE



Dr. B. K. Dev Choudhury

Principal

Pub Kamrup College

Principal

Pub Kamrup College

P.O. - Baihata Chariali

Program Outcome and Course Outcomes

Assamese

Programme Outcome

Creative thinking : The programme will help to build skills of analytical and interpretive arguments; become careful and critical readers, practice writing in a variety of genres as a process of intellectual inquiry, creative expression and ultimately to become more effective thinkers and communicators in Assamese.

Social responsibility: That literature is a reflection of the society is a fact that has been widely acknowledged. Literature indeed reflects the society, its good values and its ills. The study of B.A Assamese courses students are expected to process in depth knowledge about Assamese society in general and the Assamese language , literature, culture in which he or she lives in. The realization of responsibility to the society will be beneficial for the society in general and in the individual level as well.

Cultural awareness : Under graduate course in Assamese major deals with language, literature and culture. It incorporates Assamese literature from the 9th to the 21st century and also includes Western and Eastern literature and cultural history. The cultural history paper includes various aspects like tourism, archaeology, agriculture and fashion. This paper requires the students to acquire knowledge on indigenous dress and ornaments. It also encompasses information on various religious and historical places of interest and archaeology. Variety and scope of agriculture is another area that it covers. To acquaint the learners with the meaning of culture and various manifestations of culture such as social customs, clan , tradition, rituals, festivals, beliefs ,etc.

Career opportunities: TDC Assamese course comes with various exciting career opportunities. Students pursuing the course can find employment as a consultant, customer service associate, sociologist, relations executive, interpreter, translator, teacher , professor, content writer, content editor, journalist, Proff reader, compositor ,etc. One with a good command over the language can also take private tuitions.

Course Outcome

C01: Students will introduce with the history of Assamese literature. To learn regarding various Assamese folk literature and written literature during Sankari and Pre- Sankari era. It also aim to acquaint the students regarding evolution of Assamese scripts.

C02: Learn about the origin, development and Characteristics of the ancient Assamese poetry.

C03:To throw light on various Assamese Literature Urnig Post- Sankari to Abahan Era. Gain knowledge about the beginnings of popular assamese magazines (like Arunoday , Jonakee and Awahan) and its prose style in the late 19 th and early 20 th centuries.

C04: This paper will help the students in acquiring some knowledge on romantic and modern Assamese poetry. An idea on romantic poems, its characteristics and about the authors of these poems, could be formed .The students will know about the modern poems, its characteristics and about subject matter of these poems.

C05: To acquaint the students regarding the history and evolution of Assamese Language .Acquaint them with the Indo-European language family and will get an opportunity to learn some aspects of the worlds biggest and primary language family. The brief introduction of the Non-Aryan languages of surrounding the Northeast states of Assam and the contribution of these languages to the Assamese language.

C06:This is an optional paper. From this paper the students will be able to learn about the main theme and the style of Sankariyan and Bezbaruahan literature.

C07: The students in acquiring knowledge on the structure of Assamese language. The can learn about the uniqueness of Assamese phonology and morphology.

C08: Students will introduce with the meaning , nature , scop and characteristics of culture. It will acquaint the with cultural background of Assam as a unique cultural spot of observation as it has been occupied by various ethnic groups of people.

C09: The students have to prepare a field study report on a particular place, folk culture , folk literature, festivals etc. Under the guidance of a faculty member of the department.

C010: Acquire knowledge about the characteristics and methodology of Ankiya Nat which is a one act play written by Sankardeva and his followers for spreading the New Vaishnavism religion in 15 th century Assam.

C011: Students will introduce with the developmental history of assamese prose literature. Students will introduce with the characteristics and diversity of Assamese prose.

C012: The students can acquire knowledge about the origin, development and characteristics of Brajawalee language through some Brajawalee poems.

C013: The paper will help the students in acquiring knowledge about Pali , Prakrit and Apabhrangsha literature and language.

C014:Students will introduce with the literary theorise and its nature and scopes. Students will understand the common trajectory of growth of literary criticism and the various aspects of literary criticism and its branches.

C015: The paper will help the students in acquiring knowledge about the various language families of the world. On the other hand they can also learn the various form of language like standard language , dialect, state language, international language etc.

C016: The students will acquire knowledge about the origin of modern Assamese drama and its history and analyse some famous modern drama.

C017: Students will introduce with the developmental history of Assamese prose literature. Students will introduce with the characteristics and diversity of Assamese prose.

C018: It gives the students some idea about Indian literature and its trends through some selected texts of various language of India and abroad . Students will acquaint with the diversity of Indian and literature.

C019: Students will acquire knowledge on different types of Assamese short stories and novels.

C20: The students will learn about Assamese Sanda and Alankar (Figure of speech and verse) as eastern criticism of literature.

C021: To know about the linguistics on basis of different branches of language analysis, steps and ways .Trace the history about language study.

C022: Students will introduce with the history of Assamese poetry. Students will introduce with the characteristics and diversity of Assamese poetry. Students will introduce with some selected poets and their work.

C023: To give knowledge regarding Assamese Prose. From this paper the students will be able to learn about Assamese prose by studying some famous prose pieces.

C024: This paper the students will be able to acquire some knowledge on Ankiya Nat and Assamese modern drama in literary aspect.

C025: The students will be acquainted with some famous Assamese short stories and one famous Assamese historical novel.

C026: The paper will help the students in understanding about the evolution of Assamese script, folk literature and the literature of Pre-Sankari , Sankari yug as well.

C027: To acquaint the students regarding various language families and evolution of Assamese language.

C028: Students will introduce with the characteristics and diversity of Assamese literature till the Sankrottar Era. Students will introduce with the history of Assamese literature from the period of Awahan to contemporary Era.

C029: Students will introduce with the theoretical knowledge of Phonology, Morphology ,Syntax and Word formation of Assamese language .It will develop the language skill of students.

C030: This paper contains some famous Assamese poems which will help the students in appreciating Assamese poetry.

C031: Students will acquaint with the movements of the growth of Assamese plays.

C032: From this paper the students will be able to learn about Assamese prose through study of some selected prose pieces.

Economics

Program Outcome and Course Outcomes

PO1: This programme is designed to provide a strong foundation in Economics through proper structured curricula.

PO2: It also emphasizes in imparting theoretical and quantitative knowledge of the discipline.

PO3: After pursuing this programme, students become proficient in applying theoretical aspect in the practical world as well as analyze the policy issues.

PO4: This course builds critical thinking aptitude along with development of empirical foundation.

PO5: After graduating from this programme, students get enough opportunities for further studies as well as opportunities for employment in diverse sectors.

Course outcomes

CO1: M 104 Microeconomics I- This course provides basic microeconomic concepts comprising of consumer behaviour and demand, theory of production and cost, output decisions and profit maximisation.

CO 2: M 105 Macroeconomics I- this course enables the students to have an understanding on basic macroeconomic concepts like national income accounting, theories of output and employment, consumption function and investment function.

CO3: M 204 Microeconomics II- this course provides broader idea on microeconomics concepts in continuation to first semester course which focuses on market structure, theory of distribution, welfare economics and financial microeconomics.

CO4: M 205 Macroeconomics II - This course is a follow-up of 1st semester Macroeconomics course and emphasises on goods and money market equilibrium business cycle, quantity theory of money and inflation.

CO5: M 304 Elementary Mathematics for Economics - this course gives basic idea on elementary mathematics for economics related to basic concepts of sets, functions, equations etc and also on matrix and determinants, differential calculus and integral calculus.

CO6: M 305 The Monetary System- this course gives ideas on basic concepts of money, commercial banking, Central banking and about the financial system.

CO7: M 404 Mathematical Applications in Economics- this course is about the mathematical application in economics and it focuses on calculus in economics application, maxima and minima, elements of linear programming and also the idea to game theory.

CO8: M 405 Introduction to Development Economics- this course helps to gather knowledge on economic development and growth and their measurements, the various growth and development theories like, Smith and Ricardo development theory, Harrod-Domer model of growth, Vicious circle of poverty, balanced and unbalanced growth, Lewis theory of unlimited labour supply etc.

CO9: M 501 Elements of Public Finance- this course helps to give ideas on nature and scope of public finance, Public revenue, Public expenditure and regarding public debt. It will enable students to grasp how public finance plays a crucial role in the management of the economy.

CO10: M502 Basic statistics (for BA) / Introduction to Econometrics (for B.Sc)- It gives basic insights about the use of statistics in the various fields of economics. It focuses on central tendency and dispersion, correlation and regression and the probability. / Students learn the basics of econometrics like the theoretical distribution, statistical inference and linear regression models. This course enables students to analyse data and find results in research works.

CO11: M 503 Introduction to Environmental Economics I- it gives ideas on economy-environment interaction, market failure, externality, public good, pollution control policies and about implications and mitigations of global environmental problems.

CO12: M 504 International Trade and Policy- this paper introduces students about different theories of international trade, terms of trade and gains from trade and international trade policies.

CO13: M 505 History Economics Thought- this course provides historical insights/developments of economic ideas in various time periods like early mercantilism period, physiocracy period, classical period, Neo-classical period and the socialist thought period.

CO14: M 506 Policy and the Indian Economy- this course provides an overview of the features of Indian economy, problems concerning Indian economy and contribution of various sectors like agriculture, industry and service sector.

CO15: M 601 Public Economics- it give ideas on taxation, govt. Budget, fiscal policy and federal finance which helps students to gain knowledge about public economics.

CO16: M 602 Applied Statistics (For BA) / Econometric Methods (For BSc)- Applied Statistics course focuses on index number, time series analysis, vital statistics and sample survey. It enables to apply statistics empirically. / Econometric Methods course gives ideas on econometric methods like problems in OLS estimation, LAG models and dummy variables and time series analysis.

CO17: M 603 Economics of Natural Resources and Sustainable Development- This course is designed to provide knowledge as well as awareness to the students about natural resource and sustainable development from an economic point of view.

CO18: M 604 International Economics-Along with studying the international aspect of an economy this course provides the broader ideas about international economics as a distinct branch and the various theories concerning it.

CO19: M 605 History of Economics Thought II-This course is a continuation to fifth semester course on history of economic thought. It focuses on various schools of thought like marginalist school, Austrian school, neo classical economics and Keynesian economics. It also includes various Indian economic thought.

CO20: M 606 Planning for Development: India and the Northeast- This paper discusses about the various planning period of India, strategy and objectives. It also gives overview of India's position in global economy. Along with India as a whole special emphasis is given to northeast India in particular.

Education

Programme Outcome – BA. in Education

PO1: Comprehensive Development: The knowledge and skills provided through education leads to the comprehensive development of students including physical, mental, social, moral, spiritual etc.

PO2: Creative Thinking: Education enables the students to use imagination and critical thinking to create new and meaningful forms of ideas by fostering creative thinking abilities.

PO3: Mental Health: The subject of education promotes students' mental health by providing adequate knowledge for maintaining a sound mental health.

PO3: Social Awareness and Responsibility: Education is a subject through which social and cultural values are inculcated among the students, which further facilitates the development of social awareness and responsibility.

Course Outcome

CO1: This paper acquaints the students with the concept, nature, scope and principles of education. Further it also helps to gain knowledge about different dimensions and aims of education along with creating awareness among the students about the latest trends and current educational thoughts.

CO2: The knowledge provided through this paper enables the students to understand different aspects of psychology, mental processes, personality, intelligence, creativity. Again it also enables the students to understand the concept and process of adjustment and mental health and hygiene for promotion of mental health.

CO3: This paper provides the students an understanding of the developmental history of education in Assam as well as in India.

CO4: The students are expected to understand and different aspects of education from social perspective. It also helps to develop social habits and attitudes among the students which make them socially adjustable.

CO5: This paper acquaint the students with various emerging issues in education such as different literacy programme, women empowerment, human rights, globalization, indiscipline etc. It also acquaints the students with the concept and importance of national integration, international understanding, life skill education, peace education and role of education in promoting them.

CO6: This paper provides an understanding of different concepts and aspects of measurement and evaluation in education along with the procedure of constructing educational and psychological tests.

CO7: This paper acquaints the students with different aspects of educational technology and also introduces the students with different innovations like team teaching, E- learning, E- library etc.

CO8: This paper enables the students to understand the concept, importance and programmes of environmental education at different levels of education. Furthermore, this paper makes the students aware of environmental stressors and knowledge on disaster management education.

CO9: The knowledge provided through this paper enables the students to understand both Indian and Western philosophical thoughts.

CO10: This paper familiarises the students with the philosophy of life of various educational thinkers and their views and contributions to the present day educational thought.

CO11: This paper develops an understanding of various aspects of teacher education, different policies and practices, professional ethics and accountability of teachers and different organizations involved in teacher education.

CO12: This paper acquaints the students with the teaching- learning process, methods and devices, levels, strategies and models of teaching. Again it develops a positive attitude towards the teaching profession.

CO13: This paper enables the students to understand different statistical procedures, normal probability curve and its applications in education.

CO14: This paper develops scientific attitude among the students by enabling them to understand the concept of experimental psychology and methods of conducting various psychological experiments and tests.

CO15: This paper enables the students to understand different concepts related to development during pre-natal, infancy, childhood and adolescence period including various problems associated with different stages of human development.

CO16: This paper enables the students to understand the concept, relevance and methods and techniques of continuing education, adult education and its problems. It also equips the students with distance education, its instructional strategies along with distance mode of learning.

CO17: This paper provides an understanding of the concept of special education, different policies and legislations of government regarding person with disabilities and different issues, educational provisions and support services of special children.

CO18: This paper familiarises the students with different aspects of guidance and counselling, their problems and ways for their improvement.

CO19: This paper introduces the students with the basic concept of management, organization and administration, educational supervision, institutional planning and educational administrative structure of India in general and Assam in particular.

CO20: This paper is on project work, which enables the students to prepare projects on different practical fields.

CO21: This paper acquaints the students with scientific and sound principles and theories of education, concept of discipline and freedom and value education.

CO22: This paper enables the students to understand the concepts and aspects of psychology, educational psychology, its theories and different mental processes.

CO23: The developmental history of education during ancient, medieval and British period in India as well as in Assam is introduced to the students through this paper.

CO24: The students are expected to gain the knowledge of education from social perspective. It helps to understand education as a determinant of social change and development.

CO25: This paper acquaint the learner with the emerging issues in education including literacy programme, women empowerment, human rights, globalization, vocationalization of secondary education etc.

CO26: This paper develops an understanding of measurement and evaluation, different educational tests and their uses. It also acquaints the students with the procedure of construction of educational and psychological tests.

CO27: This paper enables the students to understand the concept and related aspects of educational technology, teaching technology, behavioural technology and instructional technology.

CO28: This paper enables the students to understand the concept and related aspects of environmental education and makes the students aware of environmental stressors and disaster management education.

Program Outcome and Course Outcomes

English

- **Creative thinking:** The literature component in English curriculum provides learning experiences to appreciate and enjoy literature, encourage self-expression and creativity, enhance student's critical and analytical skills and improve their competence in the use of English language.
- **Social responsibility:** Since literature is a mirror of the society, students are expected to possess in-depth knowledge about societies in general and the society in which he or she lives in. In the long run this realization of responsibility to the society will be beneficial for the society in general and in the individual level as well.
- **Cultural awareness:** Literature is a concoction of, language, culture and folklore. A student of language or literature is expected to have general ideas about culture and folklore. In a globalised and glocalised world cultural awareness is an important aspect that needs to be realized in a positive way. A student of English literature is expected possess this awareness.
- **Career Opportunities:** Pursuing English literature help a student to have a mastery over English language and creative writing which enables the students to move in different directions so far as career opportunities are concerned.

Course Outcome-

ENGLISH

(MAJOR PAPERS)

CO1: This paper provides a preliminary study of the English literary tradition. Students are expected to understand the literary parameters that have shaped the social and literary context of English literature beginning from Medieval to Renaissance period. This understanding acquaints them how literature is related to the society.

CO2: This course provides an understanding of poetry and drama that emerged against the aforementioned literary and historical period in England. Students are introduced to the stalwarts of English literature which helps them to understand the content and context.

CO3: Students are given to read specific periods in English literature beginning from the Restoration of Charles II and the reopening of the theatres in 1660 to the Age of Romanticism. It enhances their understanding of some of the landmark events of English literary tradition. Sense of historicity is better realized when one goes through this course.

CO4: The students are expected to understand the socio-cultural and political interests of England. The outcome is such that the students are able to identify and read the texts in context.

CO5: The socio-political scenario during the Victorian period is introduced to the students in this course with the objective of understanding the social and literary history of the Victorian society. It helps students in developing critical thinking in the field of politics and History.

CO6: In this paper, the students read the poems and fictions that are characteristic of the Victorian period. They are introduced to some great Victorian fiction and poems and also to some of the pioneers of the period.

CO7: This paper helps the students to understand the social and political background that led to the rise of the Modernist period in English and American literature. They are immensely benefitted from this paper since the basic tenets of modernism are being taught to them.

CO8: In this paper, students are introduced to some cherry-picked poetry and fiction from diverse literary cultures like the American and the Latin American. This paper is useful to them since their literary horizon would not only be limited to the British culture but would take them afar.

CO9: The stylistic, technical and thematic innovations in drama would be made available to students in this paper. They will be introduced to 20th century English and European drama and their understanding of literary genre from poetry and fiction to drama would be refined.

CO10: In this paper, students learn about the theoretical aspects of Modern Drama and the modern innovations in drama have greatly bolstered their critical thinking.

CO11: Students are introduced to the literary form of the essay through a selection of representative texts from the 18th and 19th centuries. An elaborate reading of these essays helps them to understand the political, social and cultural context of the 18th century England.

CO12: This paper has been introduced to expose students to developments in the genre of the essay in the 20th century. These developments have more to do with factual and colloquial mode of writing rather than the elevated, literary and classical style of earlier writers.

CO13: In this paper, the exemplary biographies of distinguished man of letters are taught to the students. Through various forms of life-writing such as memoirs, letters and biographies, students learn about the techniques of narrativization and appreciate the 'literary' or constructed nature of life-writing purportedly telling nothing but the truth.

CO14: A pertaining question of feminism and related body of works are introduced in this paper spanning from American feminist movements to the homegrown authors and activists. Students are confronted with women's issues and interests, her rejection of the status quo, the way a woman writer participates in the questions of selfhood and how she has empowered herself through her revolutionary writings.

CO15: In this paper students learn about the key ideas of Western literary criticism from Graeco-Roman antiquity to the modern period. Students are provided with the opportunity to study the key concepts associated with the names of significant thinkers in history.

CO16: New paradigm shifts in the field of literary criticism are taught to the students which includes the re-reading of culture, language and literature in the 20th century. Students are fully enabled to understand the common concepts and notions associated with literary theories.

CO17: The study of the relationship between literature and the physical environment is examined in this paper which is, in literary terms, known as Ecological literary criticism. Students are encouraged to critically engage in a quest for the reinstatement of nature as a positive creative process in the context of modernity and urbanization.

CO18: This paper is expected to provide a gateway to the reception of mythical ideas and images in western art and literary cultures. Students obtain knowledge of a specific range of myths and mythical characters through their literary representations and narratives.

CO19: Students are introduced to the distinctive literature produced in India in the wake of English education; first under British colonial rule and then after Independence. They learn about the concept of modern India with some preliminary knowledge of the politics of British ideas and are confronted with the basic understanding of Indian English Literature.

CO20: Set against the glorious cultural and historical background, this paper helps the students to understand the themes of poetry, fiction and drama written by notable Indian academicians. The development of early nationalist consciousness in India is also taught to the students.

General Papers:

BA

CO21: This course gives some idea about various literary prose pieces written by some reputed Indian as well as British authors. After completing the course students get acquainted with these authors, their works, style, the language they use and a reading of these texts enhances students' authors of India

CO22: This course gives an in-depth knowledge about English literature, language and culture.

BA/BSc Geography

Programme Outcome

Geography mainly concerns changes in spatial attributes in a temporal perspective. The major programme in Geography is tailored to meet the students' specific educational and professional goals in mind. It focuses on spatial studies, quantitative as well as qualitative emphasis on human environment relationship.

Studying geography a student can learn-

- The basic physical systems that effect everybody life (earth-sun relationship)
- The location of places and the physical and cultural characteristics of those places in order to function more effectively in our increasingly interdependent world.
- The geography of past time and how geography has played important role in evolution of people, their ideas, places and environment.
- The spatial organization of society and see the order in what often appears to be random scattering of people and places.
- To able to make sensible judgments about matters involving relationship between the physical environment and society.

- To appreciate earth as the homeland of humankind and provide insight for wise management decisions about how the planet's resources should be used.
- To understand global interdependence and to become a better global citizen.

Course Outcome

CO-01: The paper will be useful for students in understanding perspectives on the development trends in Geography. The paper will also be useful for students preparing for UGC Net/SLET examination and other competitive exams including the civil services.

CO-02: The students will learn that the earth is unstable and it is undergoing constant changes due to dynamic earth's processes. Students also come to know about the meaning and scope of Geomorphology as a major branch of physical geography. 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.

CO-03: This paper will be helpful to gather practical knowledge about some geomorphological concepts and ideas.

CO-04: The paper will be useful for students in developing ideas on ocean and climate related aspects of geographical analysis. The students will learn the dynamic processes associated with the ocean and also the importance and values of the ocean resources. The paper will help to provide theoretical insights and perspectives to students if they wish to pursue research programme in future. Further the paper be very useful for students preparing for UGC NET JRF/SLET examinations and other competitive examinations including civil services.

CO-05: This paper will remain useful for students in understanding about the different regions of the world in relation with physiographic, climate, population etc. This paper will also be helpful for the students preparing for UGC NET/SLET examinations and other competitive examinations.

CO-06: This paper will helpful to gain practical knowledge about oceanography, climatology and world regional geography which are very much useful to know geography precisely.

CO-07: The paper will be useful for students in developing a basic understanding of the introductory concepts in soil and biogeography. Further the paper will help to provide theoretical insights and perspectives to students if they wish to pursue a research programme in future. The paper will be very useful for students preparing for UGC NET/SLET examinations and other competitive examinations including civil services.

CO-08: The paper will be useful for students in developing ideas on how geographical aspects organize economic space and will offer perspective to students if they wish to pursue a research programme. The paper will also be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including the civil services.

CO-09: This practical paper will be helpful to gain practical knowledge about the biogeographically and economic geographical data. This paper will also useful how to prepare field study adopting research methodology.

CO-10: By the study of this paper, students will be able to learn use of a few instruments like rotameter, planimeter etc. The students will learn the preliminary concepts of morphometric analysis techniques.

CO-11: The paper will be useful for students in developing ideas in human environmental issues that geographers usually address in the anthropocene. The paper will also be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including the civil services.

CO-12: This paper will be useful to gain practical knowledge about the different geomorphic processes. It also helpful to gain practical knowledge of morphometric analysis and other fluvial geomorphic processes.

CO-13: The paper will be useful for students in developing ideas on disparities within and between countries and their fallout. The paper will also help to provide theoretical insights and perspectives to students if they wish to pursue research programme. Further the paper will help to know the developmental status of the USA and Japan. The paper be very useful for students preparing for UGC NET/SLET examinations and other competitive examinations including civil services.

CO-14: The paper will be useful for students in developing on Indian geography and its various dimensions and brief outline of SAARC nations. This paper will also be useful for students preparing for UGC NET/SLET examinations along with civil services and other competitive examinations.

CO-15: Understanding the importance of various cartographic techniques in geographical study. General understanding of map type, scale and map content. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area. Thorough understanding of the statistical methods and techniques used in geographical studies. Further the understanding of tabulation, analysis and interpretation of geographical data.

CO-16: This paper will be helpful for students in developing concepts and ideas in population dynamics and the settlement patterns. This paper will also be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including civil services.

Co-17: This paper will be helpful to gain practical knowledge about different cartographic methods particularly surveying and other map works in geographical study.

CO-18: The paper will be helpful to gather the practical knowledge about different quantitative measures in geographical studies. Practical knowledge of quantitative methods in geography is very useful in research purposes.

CO-19: The paper will be useful for students in developing ideas on environmental concepts and issues that geographers usually address. Further the paper will be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including civil services.

CO-20: This paper will be useful for the students in developing ideas and concepts about the social and political geographical aspects. This paper will help to know how the geographical conditions influence the social and political perception. Further this paper will also be helpful for the students preparing for UGC NET/SLET examinations and other competitive examinations.

CO-21: This paper will be useful for students in developing understanding on the geography of NE India particularly Assam and its various dimensions. This paper will also be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including civil service examinations.

CO-22: The paper will be useful for students in developing skills in spatial data analysis if they wish to pursue a research programme. The paper will be useful for students preparing UGC NET/SLET examinations and other competitive examinations including civil services.

CO-23: This paper will be helpful to get practical knowledge about remote sensing, GIS and GPS. Proper practical knowledge on the said topic will help to research purposes in geography.

CO-24: This course will help students to proceed with a research problem and the steps he/she should adopt and tools and craft to be employed which doing quality research.

CO-25: The students will learn that the earth is unstable and it is undergoing constant changes due to dynamic earth processes. The students will come to know about the meaning and scope of geomorphology, which is a main branch of physical geography. After gaining knowledge based on the contents embodied in this paper, the students will be able to realize the importance of geomorphological and oceanographic knowledge as applied in various developmental activities executed on the land and the oceans.

CO-26: The students will learn about the meaning and scope of climatology, biogeography and soil geography. After gaining knowledge based on the contents embodied in this paper, the students will be able to well realize the importance of climatologic knowledge to know other branches of geography properly.

CO-27: The paper will be useful for students in developing ideas on human environmental issues that geographers usually address in the anthropocene. The paper will also be useful for students preparing for UGC NET/SLET examinations and other competitive examinations including the civil services.

CO-28: The paper will be helpful to gain practical knowledge about the different concepts of physical geography.

CO-29: Understanding the importance of various techniques of preparation of maps in geographical study. It also helps for general understanding of different types of maps. It will also be helpful for acquaintance of different cartographic and quantitative techniques for preparation and solution of various facets of earth surface.

CO-30: The paper will be helpful to gain practical knowledge about different human geographical concepts.

CO-31: This paper will be useful for students in developing understanding on various concepts of regional geography and its various dimensions. This paper will also be helpful to know about the geography of India and Assam.

CO-32: This paper will be useful to gain the practical knowledge about various methods of cartography to prepare different maps. This paper will also be helpful to gain practical knowledge of different quantitative measures in geographical studies.

CO-33: This paper will be helpful to gain different knowledge, concepts and issues about the economic, political and environmental geography.

CO-34: The paper will be helpful to gain practical knowledge of cartographic methods. This paper will also be helpful for the preparation of field study.

Programme Outcome

HISTORY

The UG course in History consists of Ancient, Medieval and Modern Indian history. The course includes chapters and papers on History of Science and Technology, Historiography, Sultanate period, Mughal period, Colonial and Postcolonial India. Indian Freedom Movement is a vital part of the course. The course also includes History of Great Britain, European History and International Relations. The syllabus incorporates the history of eastern countries like China and Japan. To give the students an insight into the regional history the course includes the history of Assam of different periods.

Programme Outcome

PHILOSOPHY

PO1: Philosophy means “love of wisdom”. Its knowledge is considered as the most basic and fundamental. Philosophy is the highest branch of knowledge of the universe, aims at harmonizing and systematizing all truths and arriving at a rational conception of reality as a whole. Philosophy may be made more lively and interesting, had there been a tendency to know followed by repeated questioning. It may otherwise improve the reasoning or logical faculty of an individual.

PO2: the contribution of philosophy into human culture and civilization is very significant. Civilization without philosophy is no civilization. In order to lead the civilization towards the right direction our thinking and reasoning must be clear and right. Logic, a branch of philosophy teaches us how to promote our thinking towards right direction

PO3: Philosophy deals with real and the spiritual aspects of a human life as well as the universe. It enquires the nature of the world, soul and god which satisfies man’s deepest intellectual, moral, aesthetic and religious aspirations. Man as a social being lives in a physical, social, religious and moral environment. As philosophy is rational reflection of life and experience man is molded by the environment and moulds it according to his ideal.

PO4: “Darshana” or Philosophy is a critical examination which is otherwise called logic or reasoning. It saves us from blind faith or superstition which creates a chaotic condition in our society leading to the performance of moral acts. It helps us to build a scientific mind. The study of philosophy now a days is the need of the hour because it enables the reader to meet the challenges of the time and the different sphere of human society like-social, cultural, moral, religious, political etc.

COURSE OUTCOME

CO1: this paper provides preliminary study of the thinking, inference, nature of reasoning and its truth and validity. Basically this paper improves the reasoning faculty of the student as a whole.

CO2: this course introduces students with the nature of philosophy and also introduces the student with different methods and the origin of knowledge. This paper also let the student know how and from which the knowledge originates.

CO3: This paper basically develops the knowledge of the students how to determine the validity of arguments. It enables students to face different competitive examinations. In this paper mathematical logic is applied and solves the problem of the logical and mathematical enquiry.

CO4: This course helps the students to understand what is metaphysics and epistemology. It provides to know how the metaphysical knowledge of the universe can be obtained.

CO5: this paper let us know how the philosophical knowledge was developed in India and ancient time specially the Upanisodic and the Aesthetic School of Indian Philosophy.

CO6: In this paper students are introduced some philosophical methods in modern Western philosophy. It introduces students with the rationalistic view regarding the origin of the knowledge.

CO7: This paper introduces students with different schools of Indian Philosophy and let the reader to know how these thinkers developed logical epistemological and metaphysical knowledge of the world.

CO8: This paper basically let the students to know how the empiricistic enquiry regarding the origin of the knowledge was developed among the empiricistic philosophers and also Immanuel Kant's critical theory regarding the origin of the knowledge.

CO9: This paper is designed to provide an introduction to ancient Greek philosophy. This paper let us to know how the philosophical thinking and enquiry was developed in pre-Socratic philosophy. How they wanted to find out the ultimate staff by which the universe is composed. This paper also gives the students the basic knowledge of the philosophical problems and ideals.

CO10: In this paper the Indian contemporary thinkers made an attempt to present a systematic, critical and comprehensive study of the problem of the nature and destiny of the man. They have largely concentrated with the new meaning and reorientation to classical Indian thought. Through this paper, the student may be benefitted to realize humility in real sense.

CO11: In this paper, the Western contemporary thinkers, attempted to make a systematic, scientific, integrated, critical and comprehensive study of the problem of philosophical enquiry which are termed as new trends in contemporary philosophy.

CO12: This paper aims at to promote the student with the moral consciousness, a sense of co-operation and responsibility. How the people should lead a moral life and the relevance of morality in different fields of our activity and professions can be realized by the proper study of the paper.

CO13: The philosophy of religion is one of the most active areas of philosophical researches today. It is philosophical thinking about religion, a critical study of religion. This paper is also helpful for various competitive examinations.

CO14: This paper promotes the knowledge of the students about the society and the individual. This also introduces us with the different political and social ideologies which enable and benefit the students to face different competitive examinations.

CO15: in this paper, students learn about the Socratic and post-Socratic philosophy, Socratic virtues and ethics, Plato's Epistemology and Aristotle's metaphysics are critically discussed in this paper.

CO16: This paper provides a unique study about the Gandhian philosophy. Gandhian ethics occupy a significant place in contemporary perspectives because of its unique moral ideology. He evolves a new outlook on life and sees to solve all social, political and economic problems in the light of the principle of Ahimsa. Students can learn and may pursue the strategy how Gandhi tries to give a new orientation to the problem faced by humanity and offer a unique solution.

CO17: This is the paper in which humanism and man's existence is the main theme of philosophy. In this paper, the existential thinkers emphasized upon subjectivity of the individual and also stressed upon the freedom and responsibility of individual human being. This paper leads us to humanistic philosophy which recognizes the value and dignity of man and it makes him measure of all things. Man possesses genuine freedom of decisive action and creative choice and therefore man is the maker of his destiny. In this age, when we talk about world brotherhood, cosmopolitanism, international citizenship etc. the ethical ideals of humanism may help us to understand the inherent unity between man and man, man and nature and man and the Absolute.

CO18: This paper provides students to realize the ethical and moral consciousness, the sense of dignity of labor, freedom and responsibility of our activity, crime and punishment, sin and reward for our day to day activity.

CO19: Religion occupies a significant place and plays a very important role in our lives. Religion emerged in response to human needs. Man looked to religion for guidance when confronted with problem of life and religion guided almost every aspects of human life.

Political Science

Programme Outcome

First Semester

Paper -1 (Political Theory-I): this paper contains issues on political theory, concept of power, ideology and different perspectives on state. It aims to provide knowledge about the key concepts of political theory and its analysis. The basic objective of this paper is to impart knowledge to students about meaning and importance of politics and approaches to political theory.

Paper 2 (Politics in India-I): this paper covers the following themes- Indian constitution and its evolution, basic features of the constitution of India and three organs of government at union and state level. The main objective of this paper is to offer comprehensive knowledge about the features of Indian constitution and its background analysis.

Second Semester

Paper- 1 (Political Theory-II): the paper includes the following topics-the concept of democracy, development, justice and multiculturalism, political theory and third world. The Primary objective of this paper is to provide understanding about different theories of democracy, models of development and theories related to third world politics

Paper -2 (Politics in India-II): the paper covers the following issues related to politics in India-centre state relations, party system in India, election system in India, challenges to national integration. The paper offers a detailed analysis about the issues like terrorism, regionalism, classism and their effect on Indian national integration. Besides it offers a comprehensive study about centre state relations in Indian context.

Third Semester

Paper-1 (International relations-I)

The paper includes conceptual analysis about international relations like Balance of power, collective security as well as approaches to study international relations. It helps the students to understand the international scenario in 20th century.

Paper -2 (Public Administration- I)

The paper contains meaning, nature, scope, importance and basic principles of public administration. The paper provides practical knowledge about administrative theories, organizational structure and principles of Public Administration. The paper provides practical knowledge about administrative theories, organizational structure and principles.

Fourth Semester

Paper-1 (International relations-II)

The paper includes the following units—basic Concepts in International relations, united Nations, Security and disarmament and global economy. It aims to impart Knowledge about basic issues in international relations mostly foreign policy, diplomacy, formation, objectives and importance of UNO and its role in Global economy.

Paper-II (Public Administration-II)

The paper contains personal administration, financial administration, development administration and citizen's participation in administration. The paper helps to realize the recruitment, training, promotion of civil servants, budget preparation, bureaucracy and development administration.

Fifth Semester

Paper-I (Western Political Thinkers)

The paper contributes towards understanding the political philosophy of Greek Tradition, medieval and early modern thinkers and contractualists. It aims to provide knowledge about western political ideas and its relevance.

Paper-II (Select Constitutions-I)

The paper offers understanding about constitution and political traditions and institutions of United Kingdom and United States of America. The paper tends to provide knowledge about structure and functions of government in UK and USA.

Paper-III (General Sociology-I)

The paper provides basic understanding about the key concepts of Sociology, definition and scope of Sociology and methods to study sociology. The paper contributes towards the objective of imparting primary understanding about sociology and its key issues.

Paper-IV (Contemporary Political Issues)

The paper involves the basic issues of contemporary politics-i.e. environmental issues, terrorism, human development, human security and gender. The paper aims to provide knowledge about contemporary political issues and their impact on human civilization.

Paper-V (Political Sociology-I)

This paper provides thematic understanding about issues of political culture, socialization and mobility. Besides, the paper aims to develop knowledge on subject matter of political sociology and their relevance in contemporary social set up.

Paper-VI (Democracy in India-I)

This paper contains the themes like democracy in India, Election process, Legacies etc. the paper aims to offer knowledge on Indian democratic system and its background.

Sixth Semester

Paper-I (Indian Political Thinkers)

The paper includes the basic ideas provided by Indian Thinkers like Kautilya, Raja Rammohan Roy, M.K. Gandhi, J. Nehru, J.P. Narayan etc. the paper offers understanding about Indian set of Political ideas developed in the pre and post Independent period.

Paper-II (Select Constitutions-II)

The paper includes the political and Constitutional developments of China and Switzerland. The paper aims to provide knowledge about the structure and functions of government and politics of both the countries.

Paper-III (General Sociology-II)

The paper includes general concepts of sociology mostly social control, social change, culture and socialization. The main objective of this paper is to impart knowledge on primary concepts in sociology.

Paper-IV (Contemporary Political Ideologies)

The issues included in this paper are Neo-liberalism, feminism, Religious fundamentalism, multi-culturalism etc. the basic aim of the paper is to make students familiar with the relevant political ideologies of contemporary times.

Paper-V (Political Sociology-II)

The paper contains theories of political power, change, development and bureaucracy. The main objective of this paper is to offer knowledge about political sociological issues and theories.

Paper-VI (Democracy in India-II)

The paper includes the components of Indian democracy like federal character, socio-economic determinants, decentralization etc. the paper gives the students a detailed understanding about the decentralization process of Indian democracy, its relevance and present status.

PROGRAMME OUTCOME

Botany

Botany is a branch of Natural Science or Life Science with utmost importance. This branch of Science is especially important for the students of NE India including Assam as this region is situated in a Biodiversity Hotspot of the world.

The Programme will help the students to know the different groups of plants, process of classification and naming, physiological and biochemical processes, economic and ecological importance, genetics, etc. The programme will also help the students to understand the process of cultivation of different economically important plants, hybridization, tissue culture, processes of plant disease control, etc. Some new and promising fields of science; such as Biotechnology, Bioinformatics, Microbiology, Immunology, Ecology, Computer Application, etc.; are included in the programme which will definitely help the students for a bright future. The practicals included in the programme will help the students to get firsthand experience as well as train them for research works in future. Field Visits are included in the programme which will also help the students to acquire first hand experience.

COURSE OUTCOME:

First semester

Paper: M101 (Theory) Plant Kingdom, Algae and Fungi

This paper will provide an overall idea about the Plants- different groups of plants, their characteristic features, habit and habitats, etc. Specific importance will be given to study about two lower groups of plants, viz. Algae and Fungi.

Paper: M102 (Theory) Bryophytes and Pteridophytes

This paper is about the morphological, anatomical and reproductive characters of Bryophytes and Pteridophytes (ferns). The process of classification, economic importance, etc. of these two group of plants are also included in this paper.

Paper: M103 (Practical)

This practical paper includes about the study of some important genera of Algae, Fungi, Bryophytes and Pteridophytes. Students will able to learn- how to prepare a slide by appropriately using the stain, how to observe them under the microscope, how the particular group of plant reproduces and how to draw and describe about a plant after critical observation. Collection and preservation of different plant specimen for future study is another part of this practical paper.

Second Semester

Paper: M201 (Theory) Gymnosperms, Paleobotany and Plant Anatomy

This paper includes about the first group of flowering plants, viz. Gymnosperms. Different aspects of Gymnosperms, such as- distribution, process of classification, morphological, anatomical, reproductive characters, economic importance, etc. are included in this paper. Paleobotany, i.e. study about fossil plants, is also included in this paper. Another topic included in this paper is Plant anatomy, where the students will come to know about the internal structure of plants, particularly the angiospermic plants.

Paper: M202 (Theory) Cell Biology

This paper is about the basic structural and functional unit of life, viz. Cell. This paper includes about the discovery of cell, types of cell, different parts of a typical cell and their functions, etc.

Paper: M203 (Practical)

In this practical paper the students will learn to study about different genus of Gymnosperms and fossil specimens. They will also learn to cut anatomical sections of different plant parts, staining process of sections, preparation of permanent anatomical slides, etc.

Third Semester

Paper: M301 (Theory) Ecology, Plant Geography, Evolution

This paper is mainly about the study of our surrounding, i.e. Ecology. Topics like components of our environment; relation among the different components-the producers, consumers and decomposers; ecosystems-types and functions; environmental pollution; etc. are included in this paper. The students will also learn about the geographical aspects related to plants, i.e. Plant Geography and evolution of life in this planet.

Paper: M302 (Theory) Instrumentation and Laboratory Techniques

Different instruments and techniques are used in botany too. Starting from the basic instrument like the Microscope to different instruments like-laminar air flow, hot air oven, autoclave, incubator, etc. are used frequently in botany. This paper will help the students to learn about the basic working principles and handling of these instruments. This paper will also help the students to learn about different techniques like-chromatography, staining techniques, fixation techniques, microtomy, etc.

Paper: M303 (Practical)

This practical paper includes ecology, instrumentation and laboratory techniques. Students will learn to study about the different ecological groups of plants and also help the students to learn the different techniques and handling of different instruments.

Fourth Semester

Paper: M401 (Theory) Morphology, Palynology, Embryology of Angiosperms

This paper will introduce the students with the most highly evolved group of flowering plants, i.e. Angiosperms. Structure of root, stem, leaf, flower, etc.; process of formation of seed and fruits; types of fruits; etc. are some of the topics included in this paper.

Paper: M402 (Theory) Plant Taxonomy

In this world there are diverse types of plants growing in diverse environmental conditions. To study them scientifically one must know the process of identification, classification and nomenclature of the plants. This paper will help the students in these aspects too.

Paper: M403 (Practical)

This practical paper will help the students to understand the process of study about the morphological characters of angiospermic plants and the process of identification and classification of the plants on the basis of those characters.

Fifth Semester

Paper: M501 (Theory) Microbiology and Immunology

Study about the very small organisms, which are not visible with our naked eyes, is the Microbiology which deals with Virus, Bacteria, Actinomycetes, etc. In this paper students will come to know about the types of microorganisms, their structure, process of classification, economic importance, etc. This paper also includes immunology which is about the processes of protection of our body from different diseases.

Paper: M502 (Theory) Plant Pathology and Lichen

Like human beings plants also suffer from different diseases. Study about the plant diseases is called Plant Pathology. In this paper students will learn about different plant diseases, causal organisms of those diseases, measures of disease control, etc.

Paper: M503 (Theory) Cytogenetics, Plant Breeding and Biometrics

Different aspects related to chromosomes and genes are included in this paper. Improvement of different crops by applying different scientific methods is come under the scope of plant breeding. Students will come to know about the process of production of different hybrid crops.

Paper: M504 (Theory) Applied Botany

Applied aspects of microbiology, cytogenetics and plant breeding are included in this paper. Students will come to know-how different microorganisms are used in different fields like Agriculture, Food production, Dairy industries, pharmaceutical industries, etc.

Paper: M505 (Practical) Microbiology, Plant Pathology and Lichen

This practical paper includes-the methods of culture of microorganisms artificially in the laboratory and the processes of study of different plant diseases. Students will practically learn to handle different microorganisms in the laboratory.

Paper: M506 (Practical) Cytogenetics, Plant Breeding, Biometrics and Applied Botany

Study about chromosomes, different processes of plant breeding, biometrics, etc. are included in this paper.

Sixth Semester

Paper: M601 (Theory) Molecular Biology and Plant Biochemistry

Like other organisms plants are also consists of different chemicals which are known as biomolecules. Study about the different biomolecules like carbohydrates, proteins, lipids, etc. will come under this paper.

Paper: M602 (Theory) Bioinformatics, Computer Application and Biotechnology

This paper is newly introduced in botany to study some new and interesting topics like biotechnology, genetic engineering, bioinformatics, etc. Through this paper students will get a chance to learn about the basics of computer and its application.

Paper: M603 (Theory) Plant Physiology

Through this paper students will come to know about different biochemical processes like photosynthesis, transpiration, respiration, etc. that takes place in plants body.

Paper: M604 (Theory) Plant Resource Utilization

Plants are economically very important as they can provide us food, medicine, timbers, fibers, oils, etc. This paper will introduce the students about the different economically important plants, particularly those economically important plants which are available in our locality.

Paper: M605 (Practical) Molecular Biology, Biotechnology, Bioinformatics & Comp. Apl.

In this paper students will learn to perform practical related to molecular biology, biotechnology and bioinformatics. They will learn to use computer. They will also learn to use computer for bioinformatics purpose.

Paper: M606 (Practical) Plant Physiology and Plant Resource Utilization

Practical related to photosynthesis, transpiration, respiration, etc. are included in this practical paper. Students will also learn to identify different economically important plants.

COURSE OUTCOME

First Semester

Paper: E101 (Theory) Diversity of Microbes and Cryptogams

Through this paper students will come to know about different types of microorganisms like Bacteria, Virus, Actinomycetes, etc. and non-flowering plants like algae, fungi, bryophytes and pteridophytes.

Second Semester

Paper: E201 (Theory) Cell Biology and Genetics

This paper is about the basic structural and functional unit of life, viz. Cell. This paper includes about the discovery of cell, types of cell, different parts of a typical cell and their functions, etc. Different topics related to gene are also included in this paper.

Third Semester

Paper: E301 (Theory) Diversity of Seed plants and their Systematics

This paper deals with the flowering plants. Students will learn to identify, classify and name the plants during the study of this paper.

Paper: E302 (Practical)

Students will learn to perform practical related to microorganisms, algae, fungi, bryophytes and pteridophytes. They will also learn to study the cell and chromosome.

Fourth Semester

Paper: E401 (Theory) Plant Physiology and Biochemistry

Through this paper students will come to know about different biochemical processes like photosynthesis, transpiration, respiration, etc. that takes place in plants body. Study about the different biomolecules like carbohydrates, proteins, lipids, etc. will also come under this paper.

Paper: E402 (Practical)

Practical related to plant physiology and biochemistry are included in this paper. Students will learn to determine the Osmotic potential, DPD, rate of photosynthesis, etc. They will also learn the methods of qualitative and quantitative analysis of plant materials.

Fifth Semester

Paper: E501 (Theory) Structure, Development & Reproduction in Flowering Plants

In this paper students will learn about the basic structure of flowering plants, their internal structure (anatomy), structure, types and functions of embryo, fruit and seeds.

Paper: E502 (Practical)

Students will practically learn to study the non-living inclusions of the cell, stomata, anatomical structure of some important plants, different types of fruits, etc.

Sixth Semester

Paper: E601 (Theory) Ecology and Utilization of Plants

This paper is mainly about the study of our surrounding, i.e. Ecology. Topics like components of our environment; relation among the different components-the producers, consumers and decomposers; ecosystems-types and functions; environmental pollution; etc. are included in this paper. Economically important plants are also included in this paper.

Paper: E602 (Practical)

Students will learn to study different ecological groups of plants like hydrophytes, xerophytes, etc. They will also learn to study some economically important groups of plants like cereals, pulses, beverages, fiber yielding plants, medicinal plants, etc.

CHEMISTRY

Programme Outcome:

Understanding basic facts and concepts of Chemistry as well as its application in daily life is a general objective of the programme. It also develops a better comprehension and power of reasoning and make students skilled in various laboratory techniques used in pharmaceutical laboratories and chemical industries.

Course Outcomes:

CO1 (Physical Chemistry): This course covers the basic idea about thermodynamics and kinetics in chemistry.

CO2 (Organic Chemistry): This course related to introduction to organic compounds, stereoisomerism and reaction mechanism.

CO3 (Practical): This is a general experimental course. Through this course a student may have an idea how to determine of solubility of a salt at different temperature and how to determine the crystallization of hydrated salt.

CO4 (Physical Chemistry): It is a physical chemistry course. This course includes the basic ideas of gaseous state, liquid state, colligative properties and electrochemistry.

CO5 (Organic Chemistry): This course contains three units. Stereoisomerism is the first unit. This unit includes ideas of conformation of molecules like ethane, butane, cyclohexane and relative stability of conformers. This chapter also includes the concepts of topocity and prostereoisomerism and designation of stereoheterotopic atoms.

CO6 (Organic Practical): It is an organic practical course. From this course a student gain the ideas of analysis of an organic compound and identification by detection of N, S, halogens and test for functional groups.

Course-7 (Chemical bonding): This course aims at giving a theoretical understanding about the basic constituents of matter – atoms, ions and molecules in terms of their electronic structure and reactivity. Structure and bonding are dealt with basic quantum chemistry treatment. It also introduces some semiquantitative models on which the structures and reactions of inorganic chemistry are usually based on.

CO8 : The course is a continuation of M301, with further introduction and development of models of molecular structure in terms of the concepts of valence bond and molecular orbital theory. It also include methods for predicting the shapes of molecules. It introduces concepts used to explain the structures and reactions of a wide variety of species. It further introduces about the different types of solids and their detailed crystal structure, lattice energy calculation, extent of covalent and ionic character in bonds in molecules and different types of existing intermolecular forces which bind molecules together.

CO 9 PAPER M 303 Practical

This laboratory course is designed for students to have hands-on experience on some general experiments like determination of water of crystallisation, hardness of water. It also includes preparation and characterisation of some inorganic compounds.

CO10 (Quantum Chemistry): The first part of this course gives the concept of quantum chemistry and atomic structure. Second unit covers the ideas of term symbols, spin-orbit coupling, Pauli's exclusion principle, quantum number, calculation of radial probability functions, etc. Third unit covers the concept of Born-Oppenheimer approximation, LCAO-MO theory, MO energy level diagram of homonuclear and heteronuclear diatomic molecules, Heitler-London theory, resonance, etc

CO11 (Physical Chemistry): In the first unit of this course is molecular reaction dynamics.

CO 12 (Organic Chemistry): This course includes detailed understanding of bonding in coordination compounds. It explains structure and symmetry of coordination compounds, explain their bonding and help understand their various properties in terms of CFSE, LFT, MOT. This course also includes basic introduction of organometallic compounds including their synthesis, structure and nomenclature. Bioinorganic chemistry is also included in this course to acquaint students on the useful and harmful aspects of metals in biological systems and structure and function of haemoglobin.

CO 13 (Inorganic Chemistry): This laboratory course deals with quantitative estimation of inorganic ions by volumetric, complexometric, gravimetric, redox and precipitation methods. It also includes chromatographic separation of cations.

CO 14 (Inorganic Quantum Analysis): This is an inorganic quantitative analysis course. It covers the ideas of estimation of inorganic ions by volumetric, complexometric, gravimetric, redox and precipitation methods, chromatographic separation of cations by course/TLC.

CO 15 (Organic Preparation Practical): This course gives the ideas of preparation of different organic compounds such as benzanilide from aniline, dinitrobenzene from acetanilide, benzyl from benzoin, etc.

CO 16 (Spectroscopy): This course gives the ideas to spectroscopy. It includes the ideas of rotational, vibrational and Raman spectroscopy, electronic spectroscopy, spin resonance spectroscopy and mass spectroscopy.

CO 17 (Physical Chemistry): The first unit of this course is solid state. This unit includes the concept of Bragg's law, packing in solid, dislocation in solids, piezo and ferro electricity etc. This course also covers the concepts of macromolecules and colloids, Statistical thermodynamics and data analysis.

CO 18 (Organic Chemistry): This course includes the concepts of organic photochemistry, polymers and fibers

CO 19 (Inorganic Chemistry): This course discusses in detail the chemistry leading to colour in coordination compounds. It also describes reactivity and mechanism of reaction in different coordination compounds. Bioinorganic chemistry of metalloproteins and their role in photosynthesis, respiration, toxicity and importance of metal ions and their salts is included. It also includes a unit to understand various processes of nuclear chemistry of heavy elements and some chemistry of lanthanides and actinides.

CO 20 (Physical Chemistry Practical): This course includes different physical experiments such as determination surface tension of a liquid by stalagmometer, mutual solubility curve of phenol and water, validity of Beer-Lambert's law using colorimeter, etc.

CO 21 (Project Work): In this course students have to teach the modern techniques of analysis to investigate their prepared or synthesized product which they are prepared during their work.

PHYSICS

Paper CO1

- (a) Mathematical Methods – I**
- (b) Mechanics**

Students should be able to understand vector analysis and the applications of gradient, divergence and curl in various physical phenomena, Inertial and non-inertial reference frames, Newtonian motion, Coriolis Force, Work- energy theorem, Centre of Mass, Angular Momentum and Gravitation.

Paper CO2

- (a) Waves and Oscillations**
- (b) Ray Optics**

Students will be able to understand superposition of harmonic oscillations, Wave Motion, Sound Waves and Fourier Analysis, Fermat's Principles, Matrix Method, Lens Systems and Defects of Image.

Paper CO3

- (a) Test of Laboratory Skill**
- (b) Practical**

Upon successful completion of the course, the student will be exposed to important skills in electronics such as the identification of active and passive components in an electronic circuit, usage of a multimeter and cathode-ray oscilloscope, soldering of electronic circuits, usage of measuring instruments such as travelling microscope, polarimeter and spectrometer, experiments such as the Melde's experiment, Searle's apparatus, torsional oscillation, Jaeger's method and so on.

Paper CO4

- (a) Mathematical Methods – II**
- (b) Properties of Matter**

Successful students should be able to understand integration of vector and Curvilinear Coordinate Systems, Gamma and Dirac Delta Functions, Elasticity, Surface Tension and Viscosity.

Paper CO5

Heat and Thermodynamics

Upon successful completion of the course, the student will be able to understand the kinetic theory of gases, equation of an ideal gas and the Van der Waals' equation of state, the three laws of thermodynamics, Enthalpy, Entropy, Stefan- Boltzmann Law, Wein's Displacement Law.

Paper CO6

Practical

Upon successful completion of the course, the student will be exposed to experimental methods such as the determination of focal length of a given convex mirror, Joule's calorimeter, conversion of a galvanometer to a voltmeter, usage of a potentiometer, determination of the thermal conductivity of a given material and so on.

Paper CO7

(a) Mathematical Methods – III

(b) Electrostatics

Upon successful completion of the course, the student will be able to understand Linear Algebra, Coordinate Transformations, Gauss' Law, Laplace and Poisson's Equation, Method of Electrical Image and Dielectrics

Paper CO8

(a) Current Electricity

(b) Magnetostatics

Upon successful completion of the course, the student will be able to understand the Kirchoff's Law of Electrical Network problems, Electromagnetic Induction, Ballistic Galvanometer, Alternating Current and RLC Circuit, Physics of a Transformer, Lorentz Force, Biot-Savart's Law, Divergence and Curl of a Magnetic Field and the Ampere's Circuital Law.

Paper CO9

Practical

Upon successful completion of the course, the student will be exposed to the usage of instruments such as the deflection and vibration magnetometer, tangent galvanometer and copper voltmeter, and determination of electrical constants using potentiometer and meter bridge.

Paper CO10

(a) Mathematical Methods – IV

(b) Introduction to Computer and Computer Programming

Upon successful completion of the course, the student will be able to understand the Frobenius method for the series solution of ordinary differential equations and the special functions – Legendre, Hermite and Laguerre Polynomials, Spherical Harmonics, Probability theory and Probability Distribution Functions and Fortran Programming.

Paper CO11

(a) Wave Optics

(b) Special Theory of Relativity

Upon successful completion of the course, the student will be able to understand and appreciate the physics of Interference, Diffraction and Polarisation. In addition to this, the student will also be able to understand Galilean and Lorentz Transformation and Relativistic Momentum and Energy and Space-time.

Paper CO12

Practical

Upon successful completion of the course, the student will be exposed to experimental methods and instruments such as the Schuster's method, Newton's ring arrangement, Kater's pendulum, variation of optical rotation, resolving power of a plane transmission grating, spectrophotometer, magnifying power of a telescope and so on.

Paper CO14

Atomic Physics

Upon successful completion of the course, the student will be able to understand the Rutherford's Model, Alpha-Scattering Experiment, Atomic Spectra, Vector Atom Model, X-Rays and Scattering of Light.

Paper CO15

(a) Quantum Mechanics

(b) Astrophysics

Upon successful completion of the course, the student will be able to understand the reason for the failure of classical mechanics and the need for quantum mechanics in studying microscopic systems, Wave-Particle Duality, physical interpretation of Wave-function, Normalization, Group and Phase Velocity, Heisenberg's Uncertainty Principle, Dirac's operator formalism of quantum mechanics, the Schrodinger Equation, Celestial Coordinate Systems, Concept of Time, Stellar Magnitude and Stellar Classification system.

Paper CO16

Electronics

Upon successful completion of the course, the student will be able to understand the working of a PN junction diode, Bipolar Junction Transistor, Operational Amplifier, Multivibrators, Modulation-Frequency and Amplitude Modulation and Digital Electronics.

Paper CO17

Practical

Upon successful completion of the course, the student will be exposed to the study and analysis of the hydrogen spectrum, characteristic curve of a photo cell, determination of the Planck's and Stefan's constant, Platinum Resistance Thermometer and Thermocouple.

Paper CO18

Practical

Upon successful completion of the course, the student will be exposed to the assembly and frequency response of an operational amplifier, RC coupled common emitter amplifier, multivibrator, forward bias characteristics of a semiconductor diode, reverse bias characteristics of a Zener diode, verification of the De Morgan's theorem using IC 7400 and 7402, assembly of the digital logic gates and the usage of Microsoft Excel for graphical analysis.

Paper CO19
Nuclear Physics

Upon successful completion of the course, the student will be able to understand the nuclear forces and stability of an atomic nucleus, the three processes of nuclear decay – Alpha, Beta and Gamma Decay, Nuclear models, Nuclear Reactions, Accelerators, Detectors and Cosmic Rays.

Paper CO13
(a) Mathematical Methods - V
(b) Classical Mechanics

Upon successful completion of the course, the student will be able to understand the mathematical principles of complex numbers, analyticity of a complex function, singularities, Laurent and Taylor Series, Residue Integration, Central Force Motion, D'Alembert's Principle and the Lagrange's equation of motion, application of Lagrangian formalism in simple mechanical systems and Poisson's Brackets.

Paper CO20

- (a) **Mathematical Methods**
- (b) **Solid State Physics**

Upon successful completion of the course, the student will be able to understand the physics of tensor analysis and the mathematical principles, crystallography, crystal bonding, Free electron theory of metals, Superconductivity and Magnetic properties of Solids.

Paper CO21

- (a) **Modern Optics**
- (b) **Electromagnetic Theory**

Upon successful completion of the course, the student will be able to understand and appreciate the modern optical technologies such as crystals, lasers, holography, optical fibers, spectroscopy, Maxwell's Equations of Electromagnetic Theory, Fresnel's equations and Snell's law.

Paper CO22

- (a) **Statistical Mechanics**
- (b) **Computer Application**

Upon successful completion of the course, the student will be able to understand the physics of statistical mechanics and important statistical distributions - Maxwell-Boltzmann, Fermi-Dirac, and Bose-Einstein Statistics and their applications in explaining the numerous observed experimental phenomena in quantum systems. In addition to this, the students shall also be exposed to the programming of numerical procedures in FORTRAN/C and should be able to solve problems such as the roots of a nonlinear equation, least-square fitting, numerical solution of differential equations using the 4th order Runge-Kutta method and integration of functions using the Simpson's rule.

Paper CO23

Practical

Upon successful completion of the course, the student will be exposed to the analysis of the variation in potential drop across the components in an LCR circuit, determination of the Q-factor of an LCR circuit, Callender and Bern's Method, Anderson's Bridge, Half-wave and Full-wave rectifier, detection of cosmic rays using a Geiger-Muller Counter and the usage of a CRO in electronics.

Paper CO24

- (a) **Project**
- (b) **Computer Programming**

Upon successful completion of the course, the student will be exposed to the computer programming of measurement of the mean, standard deviation and standard error of given experimental data, solution of linear simultaneous and quadratic equations, least square fitting of data, generation of Fibonacci sequence and statistical analysis of given data using Microsoft Excel. Furthermore, the project work pertaining to an experiment with the syllabus of Physics would provide the students with performing, analysis and subsequent reporting of experiments under the supervision of a professor.

Statistics

Program Outcomes of B.Sc.

1. To conduct research work.
2. Statistics are mostly useful for observation, analysis and mathematical prediction of economical, financial model etc.
3. The main objective of the graduate major in statistics is to equip students with quantitative skill that they can employ and build on in flexible ways.
4. It help to use data to comfort real world problems.
5. Statistics are relevant topics ranging from disease prevention to storm prediction.
6. Statistics are used to calculate real wages of employees and for determining the purchasing power of money.
7. Statistics are used in formulating financial policies of Govt.

Course Outcomes

CO1: Descriptive statistics uses the data to provide descriptions of the population in a summarized way through graph, numerical analysis, table etc.

CO2: Probability theory is widely used in the area of studies such as statistics, finance, gambling, AI, machine learning, computer science, game theory and philosophy etc.

Semester – II

CO3: With the help of Central difference formula we predict or find missing value of a data series.

CO4: Taylor's expansion, jacobian, improper integrals are useful in further statistical calculation, formula derivation etc.

Semester – III

CO5: Matrix Is highly used in multivariate distribution, regression analysis and give ability to deal with multiple variable.

CO6: Standard Distribution like normal , binomial, exponential etc. fits many natural phenomena. They help us to analyses different type of daily basis problems.

Semester – IV

CO7: With the help of LPP, transportation problem we solve many real life problems through mathematical models, solve problems of business and industry related to profit and loss etc.

CO8: Mathematical model and probability helps in analyzing whether conclusions can be drawn about a particular phenomena and also to make predictions about future events.

CO9: The Chi square statistic helps in testing relationships on categorical data, also estimation can be used to calculate the value of some property of population from observation of a sample drawn from the population.

CO10: Sample survey helps in providing various types of statistical information of a qualitative or quantitative nature about the whole by examining a few selected units.

CO11: Index no. helps in measuring the difference in relative changes from time to time. Econometrics helps to prove economic theory with the help of mathematics and statistics.

CO12: Operation research is a problem solving and decision taking technique, which helps in industry , business etc.

CO13: Statistical inference help us to draw conclusion about a population on the basis of sample.

CO14: DoE is a multipurpose tool that can be used in various situations such as in agriculture, industry, scientific experiments etc.

CO15: Demography help us to solve different real life events in a scientific manner. SQC helps in maintaining and monitoring of the quality of the product and services.

CO16: Multivariate analysis provide a more accurate view of the behavior between variables that are highly correlated. Also computer programming help us to do calculations easily.

Zoology

Programme outcome

PO1: Agriculture: Students having knowledge in Zoology can help in agriculture to control different pest in the field. Besides, zoology knowledge also has contribution in ecological balance in agricultural

PO2: Health Sector:

- a. Filaria Control: Filaria is a major health problem in the present time. To control filarial, zoological knowledge is very important because the parasite is transmitted from one person to another person through fly.
- b. Malaria Control: Malaria parasites are transmitted through different mosquito species. Proper identification of mosquito species is important to control of malaria. Zoology students have knowledge about the taxonomic identification of different mosquito species and thus help control of malaria.

PO3: Fishery: Fishery is a core area in Zoology. The students of zoology learn about the different induced breeding techniques for fish breeding. After completion of the course the students can be develop entrepreneurship in the field of fishery science. There is a good market for ornamental fish and aquarium fish. Knowledge in the field of zoology helps to culture and breed different ornamental fish in commercial level.

PO4: Horticulture: In horticulture field, pollination of different plant is performed by different insect. So, proper maintenance of insect population in the horticulture field is very important for pollination of different fruit species.

PO5: Foreign trade: Students completed the degree course with zoological knowledge can involve in foreign trade of different ornamental fish species. Proper packaging of fish and other living animal is possible only with zoological knowledge.

PO6: Job Opportunity: There are great job opportunities for zoology students because there are scope to get the job in different field like agriculture, Fishery, Sericulture, Education etc.

Course outcome

CO1: This paper provides a preliminary knowledge about the Taxonomic status of different animals, concept about the species and also the biological nomenclature of different animal species.

CO2: Through this paper students can get knowledges about salient features of different phyla of invertebrate fauna viz: Protista, Parazoa, Metazoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes and Nematelminthes upto echinodermata..

CO3: The course of the practical paper throws light on the knowledge of identification of animal species based on visible characters etc.

Co4: In this course classification, general characters and specialized characters of chordates are included. Chordate groups from proto-chordates to mammas are included in this course.

Co5: This paper includes the basic concepts of ecology and wild life biology. Different types of pollutants and pollutions and the wild life conservation and management practices also included in this paper.

CO6: In this practical course , students can learn about the anatomy of different vertebrate animals through practical demonstration, qualitative detection and quantitative estimation of environmental factors etc. Study of articulated and nonarticulated skeleton skeletal system also included. Besides, preparation of temporary slides of preserved and fresh animal and their parts are also included.

CO6: The course contents through the basic ideas about different organs system in the vertebrate bodies. Endocrine gland and their physiology and the controlling mechanism of different hormone secretion in the endocrine system are also included in the course. Use of different dyes for colouring of cell and sub-cellular organelles also present in the syllabus.

CO7: The contents of the course include overview of different cell types. Learners have the opportunity to gain Knowledge about plasma membrane, Endomembrane system, mitochondria and peroxisomes, cytoskeleton, Nucleus, cell division and cell signaling. More over this course covers the practical knowledge about various stages of mitosis, meiosis, barrbody, iDNA, PAS reaction and protein structure.

CO 9: Through this practical paper students can learn about the cell types , staining and preparation procedures of cells and histological structures etc.

CO10: The course covers the brief knowledge about the embryology of vertebrate animals. Students can learn the process of egg and sperm formation, fertilization and post fertilizational development of the vertebrate animals. Cellular movement during development of the vertebrate animals is also included in this course.

CO11: This paper included genetics part where students get the opportunity to learn basic concept on gene and gene expression , mutation etc.

CO12: This practical paper covers course of the developmental process of vertebrate embryo, study of embryo at different stages and also identification of different types of chromosomes.

CO 13: The syllabus of the course covers the different physiological process of the animal body including digestion, respiration, excretion etc. Mechanism of nerve impulse generation and conduction and the synaptic transmission also included. Different cardiovascular mechanism, including regulation of heart function also included in the course.

CO14: Course contents includes transfer of energy through mitochondrial electron transport system, biochemical mechanism of enzyme action, Characters of different biomolecules.

CO15: Students can learn the different endocrine glands and their secretion and physiological activities in the vertebrate animal. Basic concept of immunity and immunization are also included in the paper.

CO16: Different Biological Techniques like microscopy, separation techniques like chromatography, electrophoresis etc included in this paper. Bio-statistical methods and procedures are included in this course.

CO17: Practical paper covers haematological study including Total count of RBC and WBC, differential count of WBC, detection of normal and abnormal constituents of urine. Behaviour of RBC in different conditions also included in the course.

CO18: In the practical paper course contents covers estimation of different component glucose, protein and cholesterol in the blood. Biochemical detection of vitamins in blood and other biological components are also included in the course. Separation of bio-molecules by different chromatographic procedures included in the course.

CO19 : This paper includes the animal behavior study where students can learn neural and hormonal control of behavior, social behavior, genetic basis of behavior etc. Different communication mechanism of the animals also included in this paper.

CO20: Main focus of the paper is on evolution and adaptation of different animals. Origin of birds development, human and horse development etc. are included in the paper.

CO21: In the economic Zoology paper students get opportunity to learn the methods of sericulture, apiculture and aquaculture. Different pest management techniques are included in this paper.

CO 22: In the biotechnology paper, course offers basic concepts of tissue culture process, gene transfer gene libraries etc. Different computer added techniques used in biological sciences and computer languages suitable for biological application are included.

CO23: In practical paper students will get practical knowledge on different pest and pest management techniques , life history of silk worm and honey bee etc.

CO24: This practical paper is project work and submission based paper where students will get practical idea about the field activities of different animals and process of collection and preservation of animals from natural sources.

Bachelor of Business Administration (BBA)

Programme Outcome – After successfully completing these program students will be equipped with skills and knowledge to be successful in the corporate sector. They would be able to effectively manage the Human Resources, Marketing, and Finance of an organization. Students can also opt for further studies or for competitive examinations. This programme imbibes a sense of discipline as emphasis is laid on overall personality development.

Course Outcomes

CO1: Elective English and business communication- This course enhances the skills of the students in written and oral communication which would be useful when they face the corporate sector.

CO2: Business economics - The objective of this subject is to give the student basic concepts and issues in business economics and their application in business decisions. The students will have knowledge about the laws of supply and demand.

CO3: Business mathematics - This course helps the students to know the financial formulas, tax calculation.

CO4: Principles of management - This course gives the student an introduction to core principles of management along with detailed description of the various management functions of Planning, Organizing, Staffing, Directing, Controlling.

CO5: Computer fundamentals (MS office) -This course helps the students to know about the role of computer in various fields.

CO6: This course provides an understanding and practise of personal and professional responsibility with the deep understanding of personal motivation.

CO6: Personality and Personal Skill Development - This course provides an understanding and practise of personal and professional responsibility with the deep understanding of personal motivation.

CO7: Indian economic scenario - To understand the various aspects of Indian economy and also gives a knowledge on different problems and approaches to economic planning and development in India.

CO8: Business statistics - Its helps to measure the performance of a business and identify trend.

CO9: Financial accounting - This course gives information about financial position of the business with the help of preparation through profit and loss account and balance sheet.

CO10: Computer application – It equips the students to get knowledge about the various applications of computer in the field of management.

CO11: Organisation behaviour - This course enables the students to learn about the various concepts, theories and techniques in the field of human behaviour at the individual, group and organizational level.

CO12: Marketing management - The course explains the essentials of marketing concepts like traditional and modern marketing. It gives knowledge about how place, product, price, people play an important role in marketing.

CO13: Cost and management accounting - This course helps the student to know about the manufacturing level of an industry through break even analysis.

CO14: Production and operational management - This course objective is to develop the understanding of concepts, theories and techniques of production process.

CO15: Office organisation and management - This course enables the students to get an in depth view of the way an office works covering a wide range of topics ranging from the handling and storing of files to the selection of office premises.

CO16: Human resource management - This course equips the students with the way employees are recruited, trained, selected in the organization. Further the processes under which performance is measured and the ways of motivating can be learnt from this course.

CO17: Marketing research - Its aim is to develop the understanding of various types of research, research process, research design and the tools for market research.

CO18: Financial management - It helps to know about financial decisions, investment decisions in the business. The way financial decisions are taken, where investments are properly utilised, how dividends are given.

CO19: Management of services - This course equips the students to know about the way various service sectors are managed

CO20: Business laws - It explains the various concepts of various laws required for conducting business ranging from domestic to international.

CO21: Summer project - This internship gives the students a practical insight of management. The students are sent for internship and they do a project based on their topics of interest.

CO22: Industrial relation - This course enables the students to learn about ways that conflicts are settled in Industries, various ways that the workers take part in the decision making in industries.

CO23: Advertising and sales promotion - This course helps the students to know about the various types of promotional strategies used by the companies. It also gives an idea about the various types of advertising mediums and the roles played by advertising.

CO24: Working capital management - It helps the students to know about the day to day operations of a business.

CO25: Consumer behaviour and retailing - This course helps the students of how to apply the knowledge of consumer behaviour can be applied in marketing. It explains and identifies how the consumers are influenced by certain factors before purchasing any product or service.

CO26: Sales and distribution management - This course focuses on how to manage and increase the sales force productivity and performance, to plan an effective sales strategy for the organization. It gives an idea about the various types of distribution system required for effective sales.

CO27: Taxation laws - This course helps the students to know the principles of law governing direct and indirect taxes.

CO28: Rural marketing - This course helps the students to know about the way scope and growth of rural marketing. It gives a glimpse of the ways product can be marketed in rural areas and the factors that influences the rural consumer before purchasing any product.

CO29: Export marketing - This course helps the students to understand the basic concept and principles of international trade, role of Govt and WTO. It also makes them aware of the EXIM policy and the ways of marketing in foreign market and the various factors associated with export marketing.

CO30: Entrepreneurship and small business management - This course takes the student into the world of entrepreneurship by making them know about the types of entrepreneur. It makes the students aware of the way an entrepreneur can get funds from various sources and the sources of idea before starting any business.

M.Sc. Biophysics

1. Programme Objectives (POs):

The main objective of the M.Sc. program in Biophysics is to give exposure and orientation of different aspects of biophysics to the students coming with a background of physical and biological sciences. During this process of orientation, the students will acquire the knowledge of the links between physical and biological sciences including Molecular Biology and Biological

Physics. Also, adequate emphasis will be given to the applications of physics, chemistry, mathematics, statistics and computer science to biological sciences.

On the whole, the students completing M.Sc. Biophysics should be able to understand the interface between physical science and biological sciences, apply knowledge of the former to the latter and design research and industrial projects.

2. Programme Specific Outcomes (PSOs):

The students completing M.Sc. Biophysics should be able to apply the principles of physical sciences to understand and solve biological complexities. Using the knowledge gained during the course, students should be able to address the academic and industrial research problems.

3. Programme Structure:

The M.Sc. Biophysics programme is a two-year course divided into four-semester. Detailed Course Objectives and Outcomes specific to each paper constituting the M.Sc. syllabus have been appended to the respective papers.

COURSE OUTCOME:

BPT-1014 : Molecular Biophysics

Course Outcome :

CO1- At the end of the course, the student should:

- refresh knowledge of basic physics and chemistry
- appreciate how various laws of physics are applicable in our everyday life.
- apply physical principles in chemical reactions and physiological systems.
- Should understand physical basis of microscopic structure of matter and chemical interaction and affect of various forces in shaping the molecular conformation.
- Should be able to apply principles of ion conduction.

BPT-1024 : Cellular Biophysics

Course Outcome :

CO2- At the end of the course, the student should be able to:

- enumerate the various cell organelles and their function
- understand the constituents and working of a cell as a whole
- describe various types of cell multiplications and divisions and differences between them
- enumerate the differences in cellular organization of various life forms

- understand how evolution can be studied on genetic basis.

BPT-1034 : Biostatistics and Computer fundamentals

Course Outcome :

CO3- At the end of the course, the student should be able to:

- choose and apply most relevant mathematics and statistical models to a given set of experimental data.
- Students will be able to apply knowledge of probability & statistical methods .
- Statistical analysis of biological data
- Errors, analysis and data measurements
- Basic computer knowledge

BPT-1044 : Biophysical Techniques & Instrumentation

Course Outcome :

CO4- At the end of the course, the student should be able to:

- understand the physical principles behind the various spectroscopic techniques available for interrogating biological macromolecules.
- choose and apply most relevant biophysical technique for characterizing the dynamic behavior of a macromolecule, especially proteins.
- understand the important aspects of the macromolecular structures
- understand how hydrodynamic methods can be used for differentiating biological macromolecules .
- identify the crystal structure through diffraction techniques.

BPT-1054 : Classical and Statistical Thermodynamics

Course Outcome :

CO5- At the end of the course, the student should be able to:

- understand storage & flow of energy and their applications
- solve the statics & dynamics of rigid bodies.
- understand the fundamental assumption that all possible configuration of a given system, which satisfy the given boundary conditions such as temperature, volume, and number of particles, are equally likely to occur.
- understand basic quantum phenomena in biological system.

Course Outcome:

At the end of the course, the student should be able to:

CO1: verify the knowledge acquired in the theory classes through experiments and apply the theory learnt to the practical problems.

CO2: Should be able to independently handle scientific equipment used in experiments.

CO3: Should be able to design adequate positive and negative controls relevant to the experiment.

CO4: Should be able to analyze data and explain the findings.

BPT-2014 : Biophysical Chemistry**Course Outcome :**

CO6- At the end of the course, the student should be able to:

- understand Concept of bonding and interaction with biomolecules.
- appreciate the effect of cooperatively in protein function
- correlate the biomolecular structure to it's specific functions
- comprehend the role of biomolecular conformation to function.
- know the role and importance of rarer biomolecules
- understand the chemical structure of various macromolecules involved in propagation of life.
- comprehend the influence of macromolecular three dimensional structure on their function.

BPT-2024 : Membrane Biophysics**Course Outcome :**

CO7- At the end of the course, the student should be able to:

- organize various membrane structure and their models and properties.
- find membrane potential through various equation.
- transport molecules across the membrane through diffusion and their types.
- transduce energy through mitochondrial membrane.

BPT-2034 : Molecular Enzymology**Course Outcome :**

CO8- At the end of the course, the student should be able to:

- understand the rate of the reaction of molecules.
- understand the working of enzymes as biocatalysts.
- understand rate and mechanism of enzymes and their function of regulation
- understand various enzymes techniques for diagnosis

BPT-2044 : Molecular Genetics & Molecular Biology

Course Outcome :

CO9- At the end of the course, the student should be able to:

- describe structure of DNA organization of prokaryotic and eukaryotic genome and their various levels of gene regulation.
- compare and contrast the mechanisms of bacterial and eukaryotic DNA replication, DNA repair, transcription
- explain concepts in DNA repair mechanisms, and recombination as a molecular biology tool
- describe translation mechanism in prokaryotes and eukaryotes, regulation of translation, and post-translational processing is able to describe post-translational processes
- apply genetic engineering in DNA profiling.

BPT-2054: Quantum mechanics for biochemistry and biophysics

Course Outcome:

CO10- At the end of the course, the student should be able to understand:

- Quantum mathematical concepts in biological system.
- Different physical and chemical principle and their structural determination of compounds.
- Different operator and wave function used.

Course Outcome:

At the end of the course, the student should be able to:

CO1: Verify the knowledge acquired in the theory classes through experiments.

Apply the theory learnt to the practical problems

CO2: Independently handle scientific equipment used in experiments

CO3: Design adequate positive and negative controls relevant to the experiment.

CO4: Analyze data and explain the findings

BPT-3014: Physiological Biophysics

Course Outcome:

CO11- At the end of the course, the student should be able to:

- Enumerate the various processes & mechanisms controlling the physiological viability and functions.
- Understand the integration of principles of physiological functioning & sustenance at the whole body level.
- Physiological behaviour of special senses.
- Physiology in different environmental situation.

BPT-3024: Immunology and Immunotechniques

Course Outcome:

CO12- At the end of the course, the student should be able to:

- Understand the components involved in generating immunity in living systems.
- Should be understand the basic principles of the immune system
- Understand different techniques

BPT-3034: Radiation Biophysics

Course Outcome:

CO13- At the end of the course, the student should be able to:

- Understand the various kinds of radiations and their effect on living systems.
- Know the hazards posed by such radiations and the required precautions.
- Principles of radiation detection and measurement.
- Application of radioisotopes in biology.
- Understand the necessity to use radioactive methods and calculations involved.

BPT-3044: Photo Biophysics

Course Outcome:

CO14- At the end of the course, the student should be able to:

- appreciate the role of light in the physiology of living organisms
- understand basic principles and law used in photochemistry
- understand the principles of interaction of light with organic molecules and their significance in environment.
- understand the biophysical principles of interaction of light with living systems and their significance in biosphere sustenance
- Optical properties known through photo medicine.

BPT-3054: Mathematics in Biological Process

Course Outcome:

CO15 -At the end of the course, the student should be able to:

- Understand the application of mathematical forces in systems.
- apply knowledge mathematics equations.

- choose and apply most relevant mathematics models to a given set of experimental data correlate mathematical methods and apply to natural (biological) problems.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

CO1: verify the knowledge acquired in the theory classes through experiments and apply the theory learnt to the practical problems

CO2: independently handle scientific equipment/software used in experiments

CO3: design adequate positive and negative controls relevant to the experiment.

CO4: analyze data and explain the findings

BPT-4014: Bioinformatics and computational Biology

Course Outcome:

CO16- At the end of the course, the student should be able to:

- understand information theory and bioinformatics network
- know different molecular biology databases and formats in which data is stored.
- understand the concept of different forms of sequence alignment methods and selection of appropriate alignment method
- Describe features that can be annotated on a DNA sequence of interest. Interpret sequence analysis results and what functional regions mean biologically
- Extract information relevant to a protein structure of interest from difference structure databases e.g. PDB. (bio informatics)

BPT-4024: Medical Biophysics

Course Outcome:

CO17- At the end of the course, the student should be able to:

- Understand the Principles of medical instruments and their applications
- Physical aspects of medical imaging techniques
- Use of basic principles of nuclear medicine and diagnostic
- Application and scope of radiotherapy.

BPT-4034: Environmental Biophysics

Course Outcome:

CO18- At the end of the course, the student should be able to:

- understand the correlation of different environmental /ecological parameters with living systems and their protection & sustenance.
- Characteristics and environmental radiations are used.
- Physical aspects of transmission of sound in several environments.
- Analytical methods by different instrument for environmental studies.

SPBPT-1: Group Theory and Spectroscopy

Course Outcome:

CO19- At the end of the course, the student should be able to:

- Understand the symmetry structure and application of group theory.
- Known physical concept on molecules principle.
- Concepts of microwave.

SPBPT-II: Advance quantum theory

Course Outcome:

CO20- At the end of the course, the student should be able to:

- understand concepts of Schrodinger equation.
- know about variation method and perturbation theory
- understand electron wave function and spin
- understand physical significance of orbital energies
- understand molecular configuration and molecular structure

SPBPT-III: Applications of spectroscopy

Course Outcome:

CO21-At the end of the course, the student should be able to:

- Understand different vibrational mode by the Application of electromagnetic radiation
- Determine structure of molecules

- determine bonding and structure of compounds
- understand the electronic transition and vibrational frequencies of different functional groups.
- Understand the fragmentation of organic compounds with respect to their structure determination.

SPBPT-IV: Mathematical Neuroscience

Course Outcome:

CO22- At the end of the course, the student should be able to:

- Understand the biophysical basis of functioning of neurons & other brain cells, their electrical behaviour & communication mechanism.
- Understand neurological equations.
- Understand the biophysics of perception, cognition & memory formation and the related neuronal disorders.

SPBPT-V: Bioelectronics and Medical instrumentation

Course Outcome:

CO23- At the end of the course, the student should be able to:

- Understand some basic concepts of electronics.
- understand different bioelectric signal.
- Understand some diagnostic and therapeutic equipment.
- Understand Some biological and physiological transducers.

SPBPDW: Dissertation

Course Outcome: To provide conceptual and hands on practical knowledge to the student in the current research areas in the field of biophysics.

CO24 - At the end of the dissertation, the student should be able to:

- understand the lacunae and complexity in the present level of understanding of biophysical principles governing biology.
- frame relevant research problems and hypothesis to address these lacunae and complexity
- Independently design logical set of experiments to investigate the hypothesis
- Analyze the data to make meaningful results.

- Explain the findings in a scientific manner.

Programme Outcome

BSc. in Computer Science

Bachelor in Computer Application

B.Voc (SDSA)

- These courses provide technology-oriented students with the knowledge and capability to develop creative solutions.
- Develop skills to learn new technology.
- Apply computer science theory and software development concepts to construct computing-based solutions.
- Career Opportunities: Computers are a part of every aspect of modern life. Job satisfaction in the field is high, so if anyone like solving problems and have a talent for mathematics and logical thinking, a degree in computer science could be the start of a rewarding career.

Computer Science

Course Outcome:

CO1: Introduction to Programming Language

This paper will develop the ability to learn new languages more quickly to understand the concept of functional programming language Develop ability to learn and write small programs in different programming Languages.

CO2: Basic Electronics: This paper will develop the ability to check the hardware issues in any electrical devices.

CO3: Practical Programming in C

This paper will develop the ability to learn basic programming skills and enhances the problem solving capacity using computer programming.

CO4: ICT Hardware:-

This paper specially focuses to understand the structure, function and characteristics of computer systems, to understand the design of the various functional units and components of computers. This paper also includes MS Word, MS power point, MS excel contents.

CO5: Discrete Mathematics:

Students will be bale to learn functionalities of basic logic gates and Boolean Algebra and other discrete mathematics applications in computer science.

CO6: Practical ICT Hardware:-

This paper specially focuses on the hardware part of the Computer system specially the motherboard parts, diagnosis also Practical of MS office (MS power point, MS Excel, MS Word etc.).

CO7: Data Structures

This paper will develop the ability to learn the structures of data and how data can actually be organized and stored in computer memory.

CO8: Computer Organization and Architecture

This paper specially focuses to understand the structure, function and characteristics of computer systems, to understand the design of the various functional units and components of computers, identify the elements of instructions sets and their impacts on processor design, to explain the function of each element of a memory hierarchy and to identify and compare different methods for computer I/O modules.

CO9: Practical Data Structure

This paper provides practical approaches to design the available user defined data structures using programming language

CO10: Operating System:

This paper focuses to understand the basic components of a computer operating system, and the interactions among the various components. The course covers an introduction on the policies for disk scheduling, CPU scheduling, deadlocks, memory management, synchronization, system calls, and file systems.

CO11: Database Management System:

This paper will develop the ability to learn the structural knowledge of data storage. It covers the the introduction of Database and DBMS.

CO12: Practical Operating System DBMS

This paper will develop the practical based knowledge of database management system.

CO13: Object Oriented Programming using C++

This paper specially focuses to students understand the principles of object-oriented problem solving and programming. This paper also analyse problems and implement simple C++ application using an object-oriented software engineering approach. After completing this subject student will be able to learn the concept of object, class, Inheritance and polymorphism.

CO14: Computer Oriented Numerical Methods and Statistical Techniques

This paper specially focuses on solving various numerical methods theoretically like Bisection, Newton-Raphson, Simpson's rules, Runge-Kutta, Polynomials etc. with the help of computer programming.

CO15: Computer Networks: -

This paper focuses to understand and describe the layered protocol model and describe,analyse and evaluate a number of data link, network, and transport layer protocols ,and evaluate networks and services homes,data centres,LANs,WANs.This paper also teach program network communication services for client/server and other applications layouts.This paper describes,anaylse and evaluate various related technical,administrative and social aspects of specific computer network protocols from standards documents and other primary materials found through research.

CO16: Microprocessor and Assembly Language Programming

This paper specially focuses to understand the structure, function and characteristics of computer systems, to understand the design of the various functional units and components of computers and different architectures which supports processor,provides interface for i/o devices,maintains timing and control of the computer.This paper will also help to learn assembly language program which helps students understanding the processor and memory functions,using assembly language program we can generate traffic control signal etc.This subjects also helps to identify the elements of instructions sets and their impacts on processor design, to explain the function of each element of a memory hierarchy and to identify and compare different methods for computer I/O modules.

CO17: Practical Object Oriented Programming and Computer Networks

This Lab paper specially focuses on practical implementation of Object Oriented Programming through C++ language and Computer Networks protocols and other terminologies relating to it.

CO18: Practical Computer Oriented NMST Microprocessor and Assembly Language Programming:

This paper specially focuses on the practical of Computer oriented numerical methods like Bisection, Newton-Raphson, Simpson's rules etc. and assembly language programming.

CO19: Automata Theory and Languages

This paper focuses to understand the basic properties of Formal Languages and Grammars of Regular, Context-Free and Recursively Enumerable languages, study on grammars to produce strings from a specific language. It also acquires concepts relating to the theory of computation and computational models.

CO20: Web Technologies

On completion of this paper, a student will be familiar with client-server architecture and able to gain basics of developing and hosting a web application using HTML, JAVASCRIPT, CSS, XML, ASP, PHP etc.

CO21: System Administration using Linux

This paper focuses to understand and describe the basics of file structures and processing with files using commands and System maintenance, Disk usage, User management, Networking and IP addressing basics and other system administration related tasks.

CO22: Practical Web Technologies System Administration using Linux

One part of this paper focuses on practical approaches to design, develop and host a web application using various languages and other part of the paper helps students to become familiar with Linux environment with various commands and tools and techniques learnt in the theory paper of System Administration using Linux.

CO23: Project

Each student is assigned with a project work based the knowledge and concepts of previous subjects taught to them and it strongly emphasizes on how a software is designed and developed from the stage of feasibility analysis to maintenance of the software.

B.Voc

Trade- Food Processing and Quality Management

Programme outcome

It has been a long felt necessity to align higher education with the emerging needs of the economy so as to ensure that the graduates of higher education system have adequate knowledge and skills for employment and entrepreneurship. The higher education system has to incorporate the requirements of various industries in its curriculum, in an innovative and flexible manner while developing a holistic and well groomed graduate.

Vocational education is education system that makes people to work in a trade or in support roles in various professions like engineering, accountancy, nursing, medicine, architecture, agriculture, food etc and is sometimes referred to as career education or technical education.

Under the two organisation -National Skills Development Corporation, and Sector Skill Councils representing respective industries the program and course is established. One of the mandates of Sector Skill Councils is to develop National Occupational Standards (NOSs) with different NSQF level (National Skills Qualifications Framework) for various job roles in their respective industries. It is important to embed the competencies required for specific job roles in the higher education system for creating employable graduates. For food processing sector, the respective SSC is FICSI- Food Industry Capacity & Skill Initiative.

Food processing is a branch of food science and is having methods, procedures and techniques which are used to transform raw ingredients into food for the consumption of humans. The rising consumerism in the societies of developed and developing countries has contributed to the growth of food processing industries with different techniques and skill.

At present in India, Food Processing Industry has been gaining momentum as the consumer's food industry. As per the report there are about 300 million upper and middle class consumers of processed and packaged food in the country, and another 200 million were likely to be added. 500 food parks are planned all over the country. This will further boost the growth and development of food processing industries and will generate huge employment opportunities for those who have an aptitude towards this work. Moreover now-a-days, industries are invested in north east in large scale. Self-employment opportunities also exist in the form of dynamic delivery networks for those who want to work on their own. So, considering all this factors the course is opted in the college and the aim of employability is satisfied by the program itself till date.

Course outcome

SKILL PART

CO1: The basic emphasis of this paper is to introduce the students of the trade about the basics of food, processing of food and different unit operations, food quality, different sanitation measures, food safety, food preservation and packaging such that students can get some ideas about the field in food sectors. Also, students are giving exposed to basic knowledge on measurements, calculation, formulations and use of basic computer knowledge in the areas of food analysis and processing.

CO2: This paper is arranged as such that, students can have the proper knowledge on basic machineries used in food processing together with different Govt food agencies who regulates and formulates different laws and rules related to food. Also, to attract the generation to make employability basic ideas are given regarding entrepreneurship and different programs.

CO3: This paper is basically formulated keeping in the mind of NSQF 4 level QP- Jam, Jelly and Ketchup processing Technician to fulfil the program criteria. The paper is structured as such that students can get the different science, chemistry, processing, preservation, packaging and quality maintenance of fruits and vegetable processing.

CO4: This paper transfers about different food quality regulation and maintenance in food

industry or that kind of organisations to the students. This paper introduces about the principles of quality management system along with different systems utilized in industry to maintain proper work environment.

CO5: This paper focus on giving the students about the complete ideas of food chemistry and conjugation of different food from nutritional and formulation point of view along with the scientific benefits of different kinds of foods in our health.

CO6: The paper is structured based on the QP- Plant Baker of NSQF Level 5 such that students have the knowledge and skill on bakery field, their processing, chemistry of different ingredients utilized for processing, quality management, documentation and certification.

CO7: This paper provides knowledge to the students of the trade about different quality analysis procedure of food to know about different effects of intrinsic and extrinsic parameters on food.

CO8: Quality system is an integral part of any food industry, without quality other all things are worthless. So the paper provides proper knowledge on different Quality Management System, different national and international bodies who give certification to the companies, different disciplinary activities maintain in the industries to meet and upgrade the quality system.

CO9: Based on the NSQF level 6 of QP- Food Microbiologist, the paper provides the students about the basic knowledge of food microbiology, instrumentation, different microorganisms, their characters, monitoring of environment and analysis of food for microbiological aspects.

CO10: This paper introduces students about the different modern technologies used in food analysis. As food is basic needs of human existence, safety of it is prime most important. So to minimize different errors, food engineering and technology sectors is always working in the areas where they can provide better technology, and to provide knowledge on these modern techniques and tools the course is formulated.

CO11: To provide knowledge about handling of complain and customer and to sustain in the quality, the course is maintained as such that students have the proper knowledge on quality tools, HACCP system, audits and documentation procedure.

CO12: Based on the NSQF level 6 of QP- Food Microbiologist, the paper provides the students about the food spoilage induces by different microorganisms, their safety, different useful and

pathogenic microorganism and their utilizations and effects in food respectively. Along with that focus is given on utilization of good microorganisms to process different indigenous fermented food products.

CO13: This paper provides an understanding about different cereal grains, pulses, oilseeds, their processing and chemistry. As we are living in the areas where the place is rich with different cultivation, so to provide the basics science regarding what we consume is mainly focused in those areas with subject specific.

CO14: As a protein rich item generally we consume the non vegan items like meat, fish and poultry and it is seen that many youth are self employable within this areas. So this paper endow with different scientific knowledge, their storage, processing and quality maintenance of those particular product.

CO15: Milk based industries are now-a-days gaining importance and rising in the areas as production of milk is good in India. Collection of milk from different areas or from society is now-a-days quite easy and this benefits both the root level and high level as it gives economic growth. Based on that different industries are establishes which gives employability. So, to be a good manager in those areas, paper is designed as such that it fulfil the NSQF Level 7 with QP- Production manager.

CO16: Assam is rich in plantation product like tea. This paper provides the general ideas about different tea, their quality aspects together with the science behind the processing and flavour of tea. The paper is oriented as such that students get a total exposure of industrial tea processing.

CO17: Packaging is a silent salesman. To keep food at its best quality from every aspect, it should properly protect and different packaging materials together with various innovative technologies are utilized by food processer in this regard. To give an exposure in this regard, the paper is designed in a way that it contains all the basics of food packaging, their characters and importance, instrumentation and new technologies of food packaging system.

CO18: This paper is given to shape the student in research and innovation and utilized their knowledge those they gather throughout the curriculum.

GENERAL PART

CO1: This paper provides the student with adequate knowledge to develop vocabulary, to have accuracy in grammar and communication, to improve proper skill on speaking, writing, reading etc.

CO2: Computer is fundamental needs in now-a-days. To give the basics of computer the paper is designed with fundamentals of computer.

CO3: The objective of this paper is to prepare the students for the competitive world, employment marketplace with a reasonable fluency in spoken English through appropriate English pronunciation and tackle themselves to fascinate them in various vocational sectors like different industries, corporate sector, public administration other government and pertinent fields.

CO4: To grow in the field of business and entrepreneurship, the paper is made as such that it provides the fundamentals of finance and accountancy.

CO5: This paper is formulated to make the students as responsible citizens towards its mother earth. To give proper knowledge on sustainability, ethical, historical and cross cultural relationship between different aspects and issues of environment and the linkage between human and nature the paper is designed.

CO6: To make aware about the culture of the society where they live and make them responsible towards the society the paper is provided in the program.

CO7: To develop a personality that is attractive and impressive in a way that it will make one to stand independently from rest, and to compete the world, the curriculum is developed.

CO8: This curriculum helps the students in development of managerial skill in them. They get an knowledge about the various functions of management like planning, organizing, staffing, directing, controlling.

CO9: This paper provides the basic ideas of entrepreneur and entrepreneurship. This helps students to know the fundamentals of entrepreneurship along with the steps of entrepreneurial process. It gives the students knowledge about the skills, characteristics required to be an entrepreneur along with the various types of entrepreneur and the ways entrepreneur contributes



to the growth of the society.

CO10: The designed paper equips the students the skills of business presentation and to imbibe the knowledge of organising a meeting, preparing agenda along with the ways to prepare for an interview.

CO11: This paper enhances the students' creative thinking capability as an entrepreneur. They get an knowledge of the licenses required to set up any business along with the sources of funding available to them.

CO12: This paper is planned in a way so that students may get benefits so that they could control their various emotions like handling of anger, reduction of stress. It makes the students aware of ways to maintain trust with others along with various techniques to increase self – esteem.

Dr. B. K. Dev Choudhury
Principal,
Pub Kamrup College

Principal
Pub Kamrup College
P.O. - Bahata Chariali