OFFICE OF THE PRINCIPAL GOVT. GIRLS COLLEGE KANKER

DISTT.-U.B. KANKER(C.G.)

PROGRAM OUTCOMES LIST

Department of Botany

Programme Qutecomes: B.Sc. Botany

Department of Botany	After successful completion of three year degree program in Botany a student is able to:
Programme outcomes	PO-1. Students know about different types of lower & higher plants their evolution in from algae to angiosperm & their economic and ecological importance. PO-2. Cell biology gives knowledge about Cell organelles & their function. PO-3. Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems. PO-4. Genetics provides knowledge laws of inheritance, various genetic interactions. Chromosomal abrasions & multiple alleles. PO-5. Structural changes in chromosomes. PO-6. Student can describe morphological & reproductive characters of plant and also identified different plant families and classification. PO-7. They knows economic importance of various plant products & artificial methods of plant propagation. PO-8. Use modern Botanical techniques and decent equipment. PO-9. To inculcates the scientific temperament in the students and outside the scientific community.
Programme Specific Outcomes	PSO-1. Student acquire fundamental Botanical knowledge through theory and practicals PSO-2. To explain basis plant of life, reproduction and their survival in nature. PSO-3. Helped to understand role of living and fossil plants in our life. PSO-4. Understand good laboratory practices. And safety. PSO-5. To create awareness about cultivation conservation and sustainable utilization of biodiversity. PSO-6. To Know advance techniques in plant sciences like tissue culture, phytoremediation plant disease management, formulation of new herbal drugs etc. PSO-7. Student able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices.

COURSE OUTCOME (CO)

B.Sc. PART-I

BOTANY

PAPER FIRST: BACTERIA, VIRUSES, FUNGI, LICHENS AND ALGAE

On completion of the course, students are able to:

- Understand the diversity of Bacteria, Viruses, Fungi, Lichens, And Algae.
- Studied some plants and diseases with special reference to the causative agents, symptoms, etiology and control measures.
- Understand the systematic position, structure, morphology, and diversity among the Bacteria, Virus, Fungi, lichen and algae.
- Understand the life cycle pattern of Algae, Fungi, Lichens Bacteria and Viruses.
- Understand about the various pigment system of Algae
- To highlight the potential of these studies to become an entrepreneur.
- To equip the students with skills related to laboratory as well as industries-based studies
- Know the useful and harmful activities of Bacteria, Viruses, fungi, Lichen and algae.

PAPER SECOND: BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY

On completion of the course, students are able to:

- Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes,
- Learn about the general characters and classification and stelar evolution in Pteridophytes, heterospory and origin of seed habit.
- Understand the economic importance of the Bryophytes.
- Know about the structure, life history and Economic importance of Gymnosperms. Studied the methods of fossilization and fossil plants

PRACTICAL –

- Learn about Microscopic observation and identification of algae, fungi, bryophytes, lichens, bacteria and viruses.

B.Sc. PART-II

PAPER FIRST: PLANT TAXANOMY, ECONOMIC BOTANY, PLANT ANATOMY AND EMBRYOLOGY

On completion of the course, students are able to:

- Learn the types of classifications- artificial, Natural and phylogenetic.
- Gain knowledge about Botanical Survey of India (BSI), National Botanical Garden Lucknow (NBRI).
- Briefly studied on Herbarium Techniques and important Herbaria.
- Learn the taxonomic evidences from molecular, numerical and chemicals.
- Brief studied the economic importance of plants as food dodder and fuel.

PAPER SECOND: ECOLOGY AND PLANT PHSIOLOGY

On completion of the course, students are able to:

- Understand plant communities and ecological adaptations in plants.
- Know about the requirement of mineral nutrition for plant growth.
- Understand the process of Photosynthesis, Respiration and Nitrogen metabolism.
- Know about the Plant Growth hormones (Auxins, Gibberellins. Cytokinin, Ethylene).
- Study on application of vital and physical forces theories on plant physiology most preferably ascent of sap, transpiration, mineral nutrition in plants and phloem transport.

PRACTICAL:

- **Taxonomy: Description and identification of locally available plants of the families.**
- **Economic Botany**
- **Preparation of Herbarium of Local Wild plants.**

B.Sc. PART -III

PAPER FIRST: ANALYTICAL TECHNOLOGY PLANT PATHOLOGY, EXPERIMENTAL EMBRYOLOGY, ELEMENTRYBIOSTATISTICS, ENVIRONMENTAL POLLUTION AND CONSERVATION

On completion of the course, students are able to:

- Principle, working and applications of analytical instruments viz, Chromatography techniques, Oven, pH meters, spectrophotometer, centrifuge, viscometer, and laminar air flow.
- Tissue culture techniques.

- General principals of plant pathology, plant quarantine, epidemiology and etiology of plant diseases.
- Know about pollution, green house gases, Ozone depletion, Bio magnification.
- Concept of biodiversity conservation, Hot Spot, IUCN threat categories, concept of sustainable development.
- Introduction and application of Biostatics, Measure of central tendency Mean, Median, Mode.

PAPER SECOND: GENETICS, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY

On completion of the course, students are able to:

- Learn about Cell and cell organelles, Mendelian principles
- Know about gene mapping methods & Extra chromosomal inheritance
- Gain knowledge on Plant breeding techniques
- Recombinant DNA technology
- Applications of Biotechnology in Plant, Animal and Human welfare
- Biotechnology and IPR, Biosafety, Biopiracy, Bioterrorism and Bioethics
- Explain the discovery, chemical nature and replication of genetic material, genetic engineering and Biotechnology

PRACTICAL:

- **Study of host parasite relationship of plant diseases.**
- **Gram staining.**
- **Instrumentation techniques.**
- **Biochemical test of carbohydrate and protein.**

CHEMISTRY- SPECIFIC PROGRAMME OUTCOME

B.Sc. Chemistry	• After completion of degree, students will able to gainthe theoretical as well as practical knowledge of handling chemicals. •Also they expand the knowledge availableopportunities related to chemistry in thegovernment services through public service commission particularly in the field of food safety, healthinspector, pharmacist etc. • Can afford a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective. • Can achieve the skills required to succeed in graduate school, professional school and the chemical industrylike cement industries, Agro product, Paint industries, Rubber industries, Petrochemical industries, Foodprocessing industries, Fertilizer industries etc. • Can get exposures of a breadth of experimental techniques using modern instrumentation. • Can understand the importance of the elements in the periodic table including their physical and chemicalnature and role in the daily life. • Can understand the concept of chemistry to inter relate and interact to the other subject like mathematics,physics, biological science etc. •Canlearn the laboratory skills and safely to transfer and interpret knowledge entirely in the workingenvironment.

CHEMISTRY- COURSE OUTCOME

Sc. – I 'hemistry)	Inorganic chemistry	COMPULSORY	1. Students will develop an understanding about the atomic structures and their rules. 2. Students will have an insight look about V.B.T. and types of hybridization . 3. Students will be able to understand about different characteristics of ionic solids , semiconductors and band theories. 4. Students will have an insight comparative study of s-block elements. 5. Students will understand about different properties & structures of p-block elements & inorganic chemical radicals.
	Organic chemistry	COMPULSORY	1. Students will be able to develop an understanding about electronic structure bonding & mechanism. 2. They will be able to learn about stereochemistry of organic compounds. 3. Students will have an idea about aliphatic and aromatic ring compounds. 4. Students will be able to perform chemical reactions , structures, substitution reactions of alkenes ,dienes and alkynes. 5. Students will develop an understanding about the mechanism &substitution reactions of alkyl and aryl halides.

	Physical chemistry	COMPULSORY	1. Students will be able to perform mathematical concept for chemist & computers. 2. Students will be able to understand the concept of Maxwell's law & J-T effect. 3. Students will have a Basic idea about Roults law &Van't Hoff factor of liquids. 4. Students will have an insight view about classification , structures and applications of liquid crystals, colloidal & solid state. 5. Students will study the about chemical kinetics & catalysis.
B.Sc. – II (Chemistry)	Inorganic chemistry	COMPULSORY	1. Deals with Basic property like complexation, colour transition and various in oxidation state of elements of 3d series. 2. student will learn about the similarities of between 4d and 5d series in to various aspect like magnetic property La/Ac contraction and spectral phenomenon. 3. In this unit various theories like VBT, MOT, LFT has been elaborated which is to co-ordination complexes and their spectral charactertics. 4. this unit deal with various isolation processes for the separation of La and Ac also complex formation and variation in oxidation state has been studied in detail. 5. various proposed method for acid and Bases has been studied in detail which is useful in various chemical reaction as well as Basics of organic and inorganic chemistry

	Organic chemistry	COMPULSORY	1. method of preparation, physical and chemical properties of alcohols, phenols, ethers and epoxides has been studied in detail. 2. Important synthesis methods and chemical reactions and oxidising nature of aliphatic and aromatic aldehyde and ketones has been studied. 3. Acidic property, effect of substituents of carboxylic acid and chemicaland physical properties of their derivatives explain in detail 4. Chemical reaction, effect of substituents on aliphatic and aromatic nitrogen containing compound has been studied. 5. important reaction, mechanism and synthesis of heterocyclic compounds and their role in drugs synthesis. Role of Amino acids in biologicalprocess and end group analysis of amino acids has been explained.

	Physical chemistry	COMPULSORY	1. This unit states with first law of thermodynamics and calculation of various mathematical expression related to ideal gases. 2. Second and third law of thermodynamics studied in detail with theBasicconcepts of entropy, pressure and temperature. 3. Various theories including nernest equation, lee chateliers equation and principle and gibbs phase rule and explain their importance;explain in detail. 4. Principles and theories which explain the electrolytic solution and theirconductivity has been explained. 5. Redox, EMF, electrode reaction and concentration cells and theirimportance explain in brief.

B.Sc. – III (Chemistry)	Inorganic chemistry	COMPULSORY	1. This unit give important information about metal-ligand bonding in transition metal complexes and types of ligand. 2. Student gains important information about ionic bond also this unit explains crystal field theory and its applications. 3. Students gains the knowledge of organometallic compounds and their chemical reactions. 4. Important elements and their important role in chemistry discussed inthis unit. 5. In this unit concept of acid and Base are discussed and the forms in which compounds occur in nature is explained.

	Organic chemistry	COMPULSORY	1. Units give the knowledge of different organometallic compounds andorganic synthesis via enolates. 2. Students the knowledge of biomolecules and their important roles inchemistry and daily life. 3. Students gains the knowledge of polymers, types of biopolymers, formation, their properties and uses. 4. This unit gives information about mass, infrared and UV/Visible spectroscopy. Students gainsknowledge of Basicprinciples of these spectroscopy. 5. Students gains knowledge about NMR and 13C Spectroscopy theirprinciple and applications.

	Physical chemistry	COMPULSORY	1. Students will know about the structure of atom, orbitals and importanceof quantum mechanics in chemistry. 2. From this unit students gain the knowledge about applications of quantum mechanics. 3. Spectroscopy plays a very important role in determination of molecular and atomic structure. This unit gives Basicknowledge aboutspectroscopy subject. 4. Understanding of Photochemical reaction, determination of reaction mechanism of photochemical reaction. 5. Students gains the knowledge about orientation of magnetic propertiesin substances. 6. This unit gives knowledge of third law thermodynamics.

Zoology program outcome

P. O. 1 Student gain knowledge and skill of fundamentals of animals student gain knowledge and skill of fundamentals of animal science .

Po.2-understands the complex interactions among various living organism.

P. O. 4-understand the structure function and mechanism of animal. P. O. 5-Understands the complex evolutionary process in behaviors of animals.

P. O. 5 Understands the complex concept of physiological process of animals and correlated Relationship of organ system.

P. o.6- Understanding of environmental concept conservation process and its relationship for humans pollution control biodiversity and protection of endangered species .

P. O. 7-To understand the importance of sericulture fish farming butterfly and Vermicompost preparation.

P. O. 8- To understand the concept of genetics and importance of skill genetics in human health and species.

P. O. 9- Apply ethical principles and commit to Professional ethical responsibilities .

P. O. 10 Develop empathy and love towards the animals.

Program specific outcomes

P. O. 1-Understand the basic concept of cell biology genetics taxonomy physiology in applied zoology .

P. O. 2 Concept analysis of relationship among animals plant in microbes.

P. O. 3 Laboratory procedure of taxonomy Physiology ecology technology entomology sericulture .

P. O. 4-Understand the concept of sericulture apiculture aquaculture And medicine.

P. O. 5 Gain knowledge about research methodology effect communication and skill of problem solving methods.

Course outcome

Animal diversity

C. O-1 Describe general concept of taxonomic rules taxonomy of animal classification.

C. O.2 Description of parasitic adaptation with example classify phylum protozoa .

C. O. 3-Describe general concept of phylum porifera to phylum porifera enchnodermata.

Ecology Animal behaviour

c. O. 1-Understand the concept of animal behaviour and response of animal to different instict .

c. O. 2-Understand the concept of interaction of biota in abiotic factors.

c. o 3 -General concept of different animal adoption with example.

Animal diversity and development biology

c. O 1 Basic concept of vertebrates classification general description of adaptation and association in their environment.

c. o 2 To understand classification of phylum protocordata to mammalia.

Cell biology genetics and evolution

C. o 1 To understand the concept of cell cell theory and function and its importance.

c. o 2 To understand the concept of genetics inheritance mendelian inheritance in non mendelian inheritance.

C .O 3 To understand the concept of genetic disorder gene mutation disorder of metabolism.

c. o 4- Basic concept of eras theories of evolution.

c. o 5- To understand the Theories of evolution of species.

Physiology and biochemistry

C. o 1 To understand the mechanism of human body and their function.

c. o 2 To understand the mechanism of human body and their function.

C. O. 3 -To understand the mechanism of physiological and biochemical factors of nature.

C. O -4 Basic concept of interaction and interpretations of physiological and biochemical process.

Animal Physiology

c. o. 1- General introduction of digestion education system with structure in function.

c. o .2 -To understand the basic concept of animal Physiology.

Immunology

c. o 1- To understand that depth knowledge of Immunity.

C. o 2 -To understand different type of immunity.

C .o .3- To get on knowledge of interaction of antigen antibody and components.

C. o 4 -Understanding of immune mechanism indices control vaccination process of interaction.

Clinical science

C .o1 Give knowledge of techniques involved in description of various disease.

c. o 2 -Basic concept of pathology associated with the various disease.

c. o 3- Basic concept of clinical science in pathology of one's own life.

c. o 4- To improve the skill of basic clinical lab equipment with experiment.

animal biotechnology

c .o.1 -To understand the knowledge animal cell .

c. o 2 - To understand the knowledge animal cell describe of animal cell in culture growth of cell.

c. o .3 -To understand the concept of recombinant DNA technology.

Aquarium management

c. o 1-To understand the knowledge of ornamental fish breeding which is highly professional.

Structural biology

C. O. 1 -To improve the knowledge about biomolecules and their role in metabolism.

c. o .2- To improve the knowledge about biomolecules and their role in metabolism to understand the classification of enzyme .

c. o .3-To improve the knowledge about carbohydrate nucleic acid and metabolic disorder .

c .o 4 To understand the knowledge of cellular organization and Functional biology nucleic acid.

Environmental And conservation biology

c. o 1 To understand the knowledge of environmental in conservation bbiology.

c. o 2 To understand the type of ecosystem freshwater marine water understand the knowledge of population characteristic and dynamics.

Animal Physiology genetics and evolution

c. o1 Student able to understand the basic concept of endocrine concept hormonal concept in their effect.

c. o 2 student able to understand the basic concept of genetics . organic evolution

c. o.2 -Student gain fundamental knowledge of Physiology of animal.

c. o 3 Student able to understand the basic concept of genetics low of inheritance central dogma with types and functions

c. o .4-Central dogma with types and functions understanding of genetics basic concept evolution human karyotype and speciation.

Entomology

C. O. 1 Knowledge of beneficial and non beneficial insects.

c. o 2 Understanding the concept of interaction of environmental with human other species.

c. o. 3understanding the concept of interaction of environmental with human other species knowledge of classification of insect.

c. O 4 knowledge of non beneficial insect who spread disease.

Sericulture

C.O. 1 Knowledge to silk moth life cycle of silk moth rearing process.

C. O. 2 Knowledge of Mulberry cultivation .

c. O. 3 knowledge of mulberry cultivation problem disease of silkworm.

c. o. 4 Knowledge of Mulberry cultivation problem disease of silk worm to get the knowledge of various process involved in silk production.

comparative animal physiology

c. O. 1 To understand the concept about Areas of response to environmental with study of respect in CNS integration behaviour .

c. o. 2 Understanding of the function of effects in the all aspect well the circulatory Physiology and reproduction and adaptation by animal.

Integuments and its derivate

c. o 1-Student will be able to understand the concept about integument system and their Derivatives

c. o 2-Understanding about skin scales here structure and function

Digestion system

c. o 1-students will be able to understand about digestion system function with structure

c. o 2-To understand the role of digestion system in body .

c. o 3-Understanding about different part of body in digestion point review.