

Session-2018-2019

M.SC. AGRONOMY (2 YEAR PROGRAMME)

PROGRAMME OUTCOME (PO) I: After passing master degree course students have further teaching and research studies option. They can also become agricultural scientist who can also work as consultants to business firms, private clients or to the government. The candidate can also pursue for Doctorate Programme.

PROGRAMME SPECIFIC OUTCOME (PSO) I: The student will learn the advance knowledge of their particular subjects and they learn about how to conduct research in agriculture field particularly to the field crops.

CO 1-Modern concepts in crop production: Students will understand the basic concepts of soil management and crop production.

CO 2-Principles and practices of soil fertility and nutrient management: Students will get knowledge of fertilizers and manures as sources of plant nutrients and apprise about the integrated approach of plant nutrition and sustainability of soil fertility.

CO 3-Soil fertility and fertilizer use: Students will get information and knowledge about soil fertility and its control. Students will understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency.

CO 4-Statistical methods for research workers: The students would be exposed to elementary mathematics that would prepare them to study their main courses that involve knowledge of Mathematics.

CO 5-Library and information services: Students will be equipped with the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

CO 6-Basic concept in laboratory techniques: Students will be acquainted about the basics of commonly used techniques in laboratory.

CO 7-Principles and practices weed management: Students will be familiarized about the weeds, herbicides and methods of weed control.

CO 8-Agronomy of oilseed, fiber and sugar crops: Students will get first hand information about the crop husbandry of oilseed, fiber and sugar crops.

CO 9-Agronomy of medicinal, aromatic and under Utilized crops: Students get acquainted about different medicinal, aromatic and underutilized field crops, their package of practices and processing.

CO 10-Analytical techniques and instrumental methods in soil and plant analysis: Students will be familiarized with commonly used instruments ,their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.

CO 11-Experimental designs for research worker: The students would be exposed to concepts of statistical methods and statistical inference that would help them in understanding the importance of statistics. It would also help them in understanding the concepts involved in data presentation, analysis and interpretation.

CO 12-Technical writing and communications skills: Students/scholars got skills to write dissertations, research papers, etc. and students/scholars with skills to communicate and articulate in English (verbal as well as writing).

CO 13-Disaster management: Learners will get the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability; and capacity building.

PROGRAMME SPECIFIC OUTCOME (PSO) II: The student will conduct their research experiment in the field and get knowledge about the data analysis related to agriculture field.

CO 1- Agronomy of Major cereals & pulses: Students will acquaint the knowledge about major grain crops, their nutrient content and their benefits to the farmers, soil health and to the society.

CO 2-Dryland farming and water shed management: Students will understand basic concepts and practices of dry land farming and soil moisture conservation.

CO 3-Principles and practices of organic farming: Students will gain knowledge of principles and practices of organic farming for sustainable crop production.

CO 4-Management of problematic soils and waters: Students will get information about basic concepts of problem soils and brackish water and their management. Attention will be on management of problem soils and safe use of brackish water in relation to crop production.

CO 5-Intellectual property and its management in agriculture: Students and stakeholders will be equipped with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.

CO 6-Agricultural research, research ethics and rural development programmes: Students will be enlightened about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

CO 7-Principles and practices of water management: Students will acquaint with principles of water management and practices to enhance the water productivity.

M.SC. AG. HORTICULTURE (VEGETABLE SCIENCE) (2 YEAR PROGRAMME)

PROGRAMME OUTCOME (PO) I: After completing master degree course the candidate have further teaching and research studies option. They can also become agricultural scientist who can also work as consultants to business firms, private clients or to the government. The candidate can also pursue for Doctorate Programme.

PROGRAMME SPECIFIC OUTCOME (PSO) I: The student will learn the advance knowledge of their particular subjects and they learn about how to conduct research in agriculture field particularly to the vegetable crops.

CO 1-Production technology of cool season Vegetable crops: The Students will learn about production technology of winter season vegetable crops.

CO 2-Growth and development of vegetable crops: Students will acquire the knowledge about physiology of growth and development of vegetable crops.

CO3-Principles and practices of soil fertility and nutrient management: Students will get knowledge of fertilizers and manures as sources of plant nutrients and apprise about the integrated approach of plant nutrition and sustainability of soil fertility.

CO 4-Soil fertility and fertilizer use: Students will get familiar about soil fertility and its control, and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency.

CO 5-Statistical methods for research workers: The students would be exposed to elementary mathematics that would prepare them to study their main courses that involve knowledge of Mathematics.

CO 6-Library and information services: Students will be equipped with the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

CO 7-Basic concept in laboratory techniques: Students will learn about the basics of commonly used techniques in laboratory.

CO 8-Production technology of warm season vegetable crops: Students will get knowledge about production technology of summer season vegetable crops

CO 9-Breeding of vegetable crops: Students will get education about principles and practices adopted for breeding of vegetable crops.

CO 10-Principles and practices weed management: Students will familiarize about the weeds, herbicides and methods of weed control.

CO 11-Analytical techniques and instrumental methods in soil and plant analysis: Students will familiarize with the commonly used instruments –their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.

CO 12-Experimental designs for research worker: Students will be exposed to concepts of statistical methods and statistical inference that would help them in understanding the importance of statistics. It would also help them in understanding the concepts involved in data presentation, analysis and interpretation.

CO 13-Technical writing and communications skills: Students/scholars will get skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).

CO 14-Disaster management: Students will become learners to the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability; and capacity building.

PROGRAMME SPECIFIC OUTCOME (PSO) II: The student will conduct their research experiment in the field and get knowledge about the data analysis related to agriculture field, particularly vegetable crops.

CO 15-Seed production technology of vegetable crops: Students will understand about the principles and methods of quality seed and planting material production in vegetable crops.

CO 16-Systematic of vegetable crops: Students will be acquainted with morphological, cytological and taxonomy of vegetable crops.

CO 17-Production technology of under exploited and underutilized vegetable crops: Students will get first hand information of production technology of underutilized vegetable crops.

CO 18-Management of problematic soils and waters: Students will get knowledge about basic concepts of problem soils and brackish water, and their management. Attention will be on management of problem soils and safe use of brackish water in relation to crop production.

CO 19-Intellectual property and its management in agriculture: Students will understand and interact with stakeholders for knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.

CO 20-Agricultural research, research ethics and rural development programmes: Students will enlighten about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

CO 21-Principles and practices of water management: Students will equip with knowledge of principles of water management and practices to enhance the water productivity.

CO 22-Post Harvest Technology of Fruit and Vegetable Crops: Students will facilitate with deeper understanding on principles and practices of fruit and vegetable technology.

CO 23-Forcing Techniques and Organic Vegetable Production Technology: Students will be imparted with latest knowledge in growing of vegetable crops under protected environmental condition and also get information about principles, concepts and production of organic farming in vegetable crops.

B.Sc. AGRICULTURE (4 YEAR PROGRAMME)

PROGRAMME OUTCOME (PO) III: This programme will develop a wide mix of technical skills and knowledge, including land use, farming practice and food production, as well as an understanding of the scientific, ethical and business principles that underpin the agricultural industry. The student can also pursue their masters in particular subject of their interest.

PROGRAMME SPECIFIC OUTCOME (PSO): I After Completion of B. Sc. Agriculture Ist year students have basic knowledge of agriculture and their particular subjects

CO1-Introductory Agriculture: This course basically imparts knowledge about history, general principles of agriculture and classification of crops.

CO2-Introductory Agrometeorology: This course basically imparts knowledge regarding the processes that connect atmosphere, soil and vegetation and also provide knowledge about the theoretical and practical tools.

CO3-Elementary microbiology: Students will communicate science as assessed by their ability to utilize microbiology concepts to analyze and synthesize microbiological literature.

CO4-Introduction to soil science: Students will learn about the importance of soil analysis and its relation to sustainable use and able to analyze physical, chemical and biological properties of soils.

CO5-Principles of agriculture economics: This course basically focuses on the foundation of commodity markets. Students will learn to list and explain different agricultural economic fields, food industry, demand theory, supply theory and competitive environments

CO6-Basic botany: This course will basically impart knowledge about the different parts of plants, their morphology, anatomy and their importance in our day to day life.

CO7-Mathematics: Students will learn the importance of Menstruation, Algebra and Coordinate geometry in relation to agriculture

CO8-English communication skills: Students will interpret text with attention to ambiguity complexity and aesthetic value; student will practice writing process and will read diverse text within their historical and cultural context.

CO9-Punjabi compulsory: Student will learn about literature and grammar related to Punjabi language.

CO10-Computer applications: The students will be able to apply knowledge of computing to solve specific computer based problems

CO11-Vegetable production technology: Students will be able to identify plant vegetative and reproductive structure and effect of environment on plant growth.

CO12-Elementary biochemistry: Knowledge and understanding of basic principles and physical science to study of biological system to explain how organism consume and convert energy to enable the process of life.

CO 13-Introductory forestry: The student will learn about the history of forestry development and their distribution and classification.

CO 14-Soil chemistry, soil fertility and nutrient management: To impart the knowledge of soil chemical properties and some beneficial and functional nutrients and fertility status of soil.

CO 15-Principles of genetics: Students will be able to describe the fundamental molecular principles of genetics and understand the structure of DNA, RNA and proteins.

CO 16-Basic zoology: Students will learn about basic cell structure, cell cycle and divisions along with binomial nomenclature.

CO 17-Mathematics: Students will learn about trigonometry, elementary calculus, integration of standard forms and elements of metrics and determination.

CO 18-English communication skills: Students will learn about translating skills and developing stories from the hints and about synonyms and antonyms.

CO19-Punjabi compulsory: Students will learn about literature and grammar related to Punjabi language.

CO20-Drug abuse problem, management and prevention: Students will be able to describe the psychological, physical and social effect of psychoactive substances on person using it and its prevention and recovery

PROGRAMME SPECIFIC OUTCOME (PSO) II: Students will have the basic knowledge to handle the problems related in the field of Soil & Water conservation, Cultivation practices of different Rabi and Kharif crops, Farm Power machinery, Livestock management, Flower cultivation and Landscape gardening along with Cultivation and Post harvest handling of fruit crops.

CO1-Principles of agronomy-I (Kharif Crops): Student will learn about intensive cropping patterns of Kharif crops and integrated farming system to increase crop production.

CO2-Crop Physiology: Student will learn plant physiology. It helps in increasing food production by making student familiar about mineral deficiency, water requirement, and toxicity symptoms and to control the pests of crop.

CO3-Insect morphology and systematic: Student will learn about the structure, classification, systematic and diversity of insects.

CO4-Dimensions of agricultural extension: This subject encompasses diverse range of socially sanctioned and legitimate activities which improve the abilities of farmer to adopt more appropriate and new agricultural practices.

CO5-Farm power and machinery: In this subject student learns about the latest farm equipments and their working in related to different agricultural practices.

CO6-Manures and fertilizers: Students will learn about various organic and inorganic fertilizers and their role for increasing crop production.

CO7-Production technology of fruit crops: Student will become familiar about nursery management and cultivation practices of tropical and subtropical fruit crops.

CO8-Soil Physics and erosion management: The student will learn about soil composition and profile in related to various factors effecting soil conservation and soil management.

CO9-Introduction to food science and postharvest value addition: This subject encompasses about the production, consumption, post harvest handling and value addition of foods.

CO10-Environment studies and road safety awareness: Student becomes familiar about the environmental issues and road safety awareness.

CO 11-Principles of agronomy-II (Rabi Crops): Student will learn about intensive cropping patterns and integrated farming systems of Rabi crops.

CO12-Principles of seed technology: The student will learn about various factors about seeds in related to production, quality, certification processing, package and storage of seeds.

CO13-Insect ecology and integrated pest management: Students get the knowledge about the insect ecology, beneficial and non-beneficial insects in agriculture along with the different methods of insect's control.

CO14-Extension methodologies and communication skills for transfer of technology: The student will have basic idea about the various methods used in

agriculture extension keeping in mind the sociology of farmers to increase agriculture production.

CO15-Livestock production and management: The students will learn about different breeds of animals and poultry along with their production and management practices.

CO16-Organic farming: This subject increases the basic knowledge of students about integrated nutrient and weed management along with the integrated diseases and pest management.

CO17-Flower cultivation and landscape gardening: Students will study the basic landscaping garden principles and styles and the package practices of various flower crops, trees, shrubs, climbers, shade loving plants.

CO18-Fundamentals of soil and water conservation engineering: The students will learn about various methods of soil leveling and its importance in water conservation.

CO19-Fundamentals of agribusiness management and entrepreneurship development: The students will learn about principles and practice of agricultural marketing and procedures of entrepreneurship in agriculture to uplift the economic status of farmers

PROGRAMME SPECIFIC OUTCOME (PSO) III : After completion of this year, students will learn about different breeding techniques, diseases of different field and horticultural crops and gain basic knowledge of statistics and marketing of produce.

CO 1-Water management and micro-irrigation: The students will learn to improve the crop yields of small holder farmers through implementation of sustainable irrigation system and water management practices.

CO 2- Chemistry of agrochemicals, plant products and growth regulators: The student will get knowledge regarding various agrochemical products i.e. fungicides, insecticides, herbicides, PGRs.

CO 3-Agriculture marketing, trade and prices: Under this, students acquire knowledge regarding internal trade, exports and imports, price support and market production.

CO 4-Plant pathogens and principles of plant pathogens: This course provides information about important plant pathogenic organisms with examples of diseases caused by them.

CO 5-Insect pests of crops and stored grain: Through this course, students will learn about identification of insect pests, handling and storing grain basic skills after harvest.

CO 6-Principles of plant breeding: Main aim is to provide information about the improvement of genetic makeup of crop plants, yield, quality, disease resistance and various plant breeding techniques.

CO 7-Principles of biotechnology: This course will provide information to students that how they can address problems in all areas of agricultural production and processing.

CO 8-Dairy technology: Under this course, students will learn about dairy products, their processing and marketing.

CO 9-Renewable energy: Students in this course will be provided with the information to use agri-waste, solar energy, wind energy and bio-fuel for their daily needs with low cost.

CO 10-Basic Statistics: This course provides information about estimation, planning and forecasting the agricultural operation of a given unit of area at given point of time.

CO 11-Production economics, farm management and agricultural finance: This course provides information about management of farms, marketing of agri-produce, agri-finance and govt. schemes for agri and allied activities.

CO 12-Diseases of field crops and their management: In this course, students will learn about the diseases of different crops, their symptoms and management by using different methods of disease control.

CO 13-Diseases of horticultural crops and their management: By studying this course, students will be able to identify the diseased horticulture crops, their symptoms, disease cycle and integrated management.

CO 14-Breeding of field and horticultural crop: This course enables students to learn about different breeding methods for different agriculture and horticulture crops

CO 15-Protected cultivation and post harvest technology: In this course, students will be taught about cultivation of agriculture crops and fruit trees in the controlled environment, their harvesting and processing.

Programme Specific Outcome (PSO) IV After Completion of B. Sc. Agriculture 4th year students have enough knowledge about use of new techniques for agriculture production, its marketing and to deal with farmers

CO 1-Entomology: By this course students will be able to Know about the fascinating world of insect, the most numerous and diverse animal species and their morphological characters.

CO 2-Applied statistics: This course provides information to students that how they will frame problems using multiple mathematical and statistical representations with goal at applying statistics in context.

CO 3-Agronomy I, II & III: In this course student will familiarized about recent concept of crop production and system approach with different management practices.

CO 4-Pomology I, II & III: Students will learn about the orientation, planting system and cultivation of fruit crops as the education and preparation needed to become pomologist.

CO 5-Soil science: Student in this course knows about soil properties, soil water, soil testing, and quantitatively analysis of soil to minimize crop growth.

CO 6-Horticulture II: This course will give information to student that how they will adopt forest plants cultivation with the crops and maximize their income.

CO 7-Agriculture extension: This course will give information to student that how they can deal with the farmers, laymen's and the people with little knowledge about new research and invention in agriculture.

CO 8-Farm management: Student in this course will study about using input to create goods and services having value to producers and its management.

B.Sc. (Medical)

Program Outcomes (PO)

Bachelor of Science (B.Sc.) offers theoretical as well as practical knowledge about different subject areas viz. Botany, Zoology and Chemistry. This programme course is most beneficial for students who have a strong interest and background in Science. The course forms the basis of science and comprises of the subjects like chemistry, botany and zoology. It helps to develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace. To further hone their skills students can go for higher studies i.e. M.Sc. and then do some research for the welfare of mankind. Students can join as scientist. Apart from the research jobs, students can also work or get jobs in other technical fields like pharmaceutical, medical, school or college laboratories. Science graduates also recruited in the bank sector to work as customer service executives. Students can also find employment in government sectors.

Program Specific outcome (PSO)

- B.Sc. Medical student is able to acquire knowledge regarding Botany, Zoology and Chemistry.
- Students will be able to define and explain major concepts in the biological sciences.
- They are able to correctly use biological instrumentation and proper laboratory techniques.
- Students will be able to communicate biological knowledge in oral and written form.
- Students will be able to recognize the relationship between structure and function at all levels: molecular, cellular and organism.
- They can go for Indian Forest Services and other competitive examinations.
- They can opt for higher studies in Botany, Zoology, Chemistry, Biotechnology, Microbiology and food technology, Human genetics, Environment sciences, Forensic, Biochemistry and Fisheries.

Course specific outcome

CO1: Paper I: Cell Biology and Animal Diversity

The course improves the student's understanding of the

- Concepts of the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.
- Cellular components are used to generate and utilize energy in cells and how the process of cell division takes place.
- Cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.

CO2 & CO3: Paper II: Biodiversity I and Paper III: Biodiversity II

At the end of the course the students will be able to comprehend and appreciate

- The huge diversity of life animal forms existing on the earth ranging from the simplest, smallest protozoan to the highly complex and largest aquatic or land vertebrates.
- The basics of systematic and understand hierarchy of different categories.
- An insight into diagnostic characteristics of different phyla through brief studies of examples while going through the various aspects of physiology, morphology, habits, habitats and adaptations in non-chordate and chordate life forms.

CO4: Paper IV: Ecology

This course will help students to understand core concepts and methods from

- Ecological and physical sciences and their application in environmental problem-solving.
- Appreciate the ethical and cross-cultural context of environmental issues and the links between human and natural systems.
- Apply system concepts and methodologies to analyze and understand interactions between social and environmental processes. Reflect critically about their roles and identities as citizens, consumers and environmental factors in a complex, interconnected world.

CO5 & CO6: Paper V: Chordates I and Paper VI: Chordates II and Evolution

It will help students appreciate the importance of

- Comparative vertebrate biology in understanding our own biology by learning about the organization, function and adaptive strengths and weaknesses of our own bodies, and how these traits have been shaped by our evolutionary history.
- Besides, they will also be able to obtain an overview of phylogenetic relationships and evolutionary trends of these organisms.

CO7 & CO8: Paper VII: Biochemistry and Paper VIII: Animal Physiology

- The Course improves the physiological and biochemical understanding through scientific enquiry into the nature of mechanical, physical, and biochemical functions of humans, their organs, and the cells of which they are composed.

- It helps the students understand the interactions and interdependence of physiological and biochemical processes.
- Students are taught about the detailed concepts of digestion, respiration, excretion and the functioning of nerves and muscles along with the concepts of endocrine systems and homeostasis thereby gaining fundamental knowledge of animal physiology and biochemistry.

CO9: Paper-IX: Developmental Biology

- The course will help students gain a knowledge about vertebrate anatomy by explaining to them the basic structures and organization of anatomical systems, their development and function and their modifications in the major transitions in vertebrate evolution.
- At the end of the course the students will develop skills of integrative and synthetic thinking by demonstrating how to organize anatomical details into general explanations based on developmental, functional and evolutionary principles, how to draw connections between anatomical changes and changes in habitat, lifestyle, and patterns of evolutionary diversification and how to use fundamental concepts of comparative anatomy to construct scientific explanations and formulate new questions and lines of inquiry.

CO10: Paper-X: Genetics

- The students will come to know about the concepts of Mendelian and non mendelian inheritance and the role of genes in genetic disorder, gene mutations- various causes associated with inborn errors of metabolism.
- The course will also provide an insight into the cell cycle, linkage analysis, chromosomal maps and theories of Evolution along with the knowledge of population genetics and species concept.

CO11: Paper XI: Medical Zoology

- The course provides an insight into concepts of parasitology and human parasitic diseases and their causal organisms, the types of immunity.
- The course improves the understanding of fundamental complement of numerous diseases which have significant impact on human health and Understanding of Insect vector host interactions of many important diseases like Malaria, Filaria, and Dengue etc.
- Course gives insight into physiology, biochemistry and reproduction of insect vectors and their control measures.
- Students gain knowledge about the concepts of overview of Entomology. Source reduction and environmental methods for vector control, biological control and other Insect bites.

CO12: Paper XII: Medical Laboratory Technology

- This course will make students competent to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including hematology, chemistry, microbiology, urinalysis, body fluids, molecular diagnostics, and immunohematology.
- They will be proficient to solve problem, troubleshoot, and interpret results and use statistical approaches when evaluating data.
- They are also acquainted with the application of safety and governmental regulations and standards as applied to medical laboratory practice.

CO13: Paper-I: Diversity of Microbes

On completion of the course, students are able to:

- Understand the diversity among Algae.
- Know the systematic, morphology and structure, of Algae.
- Understand the life cycle pattern of Algae.
- Understand the useful and harmful activities of Algae.
- Understand the Biodiversity of Fungi
- Know the Economic Importance of Fungi

CO14: Paper-II: Diversity of Cryptogams

On completion of the course, students are able to:

- Understand the morphological diversity of Bryophytes and pteridophytes.
- Understand the economic importance of the Bryophytes and pteridophytes..
- Know the vegetative characteristics of the plant genera.
- Learn about the reproductive characteristics of the plant genera.
- Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.

CO15: Paper III: Cell Biology

On completion of the course, students are able to understand

- Gain knowledge about “Cell Science”.
- Understand Cell wall Plasma membrane, Cell organelles and cell division
- The eukaryotic cell cycle
- Know the details of Microscopy- Principles of light microscopy, electron microscopy (TEM and SEM).
- Structure and organization of cell membrane
- Process of membrane transport and membrane models

CO16: Paper IV: Genetics and Evolution

On completion of the course, students are able to understand

- The eukaryotic cell cycle and mitotic and meiotic cell division.
- To study the phenomenon of dominance, laws of segregation, independent assortment of genes.

- Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.
- Understand the process of synthesis of proteins and role of genetic code in polypeptide formation.
- To understand the different types of genetic interaction, incomplete dominance, co dominance, inter allelic genetic interactions, multiple alleles and quantitative inheritance etc.
- The concept of operon and its structure and regulation.
- To understand Mendelian and Neo-mendelian genetics.

CO17: Paper-V: Diversity and Systematics of Gymnosperms

On completion of the course, students are able to:

- Understand the morphological diversity of Gymnosperms.
- Understand the economic importance of the Gymnosperms.
- Know the evolution of Gymnosperms.
- Understand the habit of the angiosperm plant body.
- Know the vegetative characteristics of the plant.
- Learn about the reproductive characteristics of the plant.
- Understand the diversity of Gymnosperms in India.
- Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features
- Know the conceptual development of “taxonomy” and “systematic”.
- Understand the plant morphology and basic taxonomy. Know the scope of Paleobotany, types of fossils, its role in global economy and geological time scale.
- 11 Understand the various fossil gymnosperm genera representing different fossil groups.

CO18: Paper-VI: Diversity and Systematics of Angiosperms

On completion of the course, students are able to:

- Understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms.
- Understand the general range of variations in the group of angiosperms.
- Trace the history of development of systems of classification emphasizing angiospermic taxa.
- To learn the wide activities in angiosperm and trends in classification.
- Learn about the characters of biologically important families of angiosperms.
- Know the floral variations in angiospermic families, their phylogeny and evolution.
- Understand various rules, principles and recommendations of plant nomenclature produces in plant identification.
- Understand major evolutionary trends in various parts of angiospermic plants

CO19: Paper VII: Plant Anatomy

On completion of the course, students are able to:

- Understand the scope & importance of Anatomy.
- Know various tissue systems.
- Understand the normal and anomalous secondary growth in plants and their causes.
- Perform the techniques in anatomy.
- With respect to recent knowledge students should know about the different tools in the taxonomy so as to relocate the phylogenetic position of plant or taxa.

CO20: Paper VIII: Development and Reproduction in Flowering Plants

On completion of the course, students are able to:

- Restate the conditions necessary for seed germination.
- Explain the characteristics of growth and development.
- Demonstrate plant growth with the help of a Lever auxanometer.
- Explain the mode of action of phytohormones.
- Discuss the various aspects in regulation of plant development.
- Express senescence and photoperiodism
- Know the methods of pollination and fertilization.
- Know fertilization, endosperm and embryogeny.
- How hormones regulate different physiological activities?
- Understanding of plant life cycles, propagation, reproduction

CO21: Paper-IX: Plant Physiology

On completion of the course, students are able to:

- Understand the biochemical nature of cell.
- Know the chemical nature of Biomolecules.
- Learn and understand about mineral nutrition in plants.
- Understand the growth and developmental processes in plants.
- Know about Photosynthesis and Respiration in plants.
- Understand the process of translocation of solutes in plants.
- Concept of enzyme activity and enzyme inhibition.
- Know the nitrogen metabolism and its importance.
- Know importance and scope of plant physiology.
- Understand the plants and plant cells in relation to water.
- Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C₃ and C₄ pathways.
- Understand lipid metabolism in plants.
- Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
- Learn about the movement of sap and absorption of water in plant body.

CO22: Paper-X: Plant Growth, Development and Biotechnology

On completion of the course, students are able to:

- Understand the fundamentals of Recombinant DNA Technology.
- Know about the genomic organization of living organisms, study of genes genome, chromosome etc.
- Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication.
- Know about the Genetic Engineering.
- Understand the principle and basic protocols for Plant Tissue Culture.
- The students will learn about the basic concept, technical skills, hands-on experience and training in plant tissue culture and molecular biology.
- Know about the Genetic Engineering.

CO23: Paper XI: Plant Ecology

On completion of the course, students are able to:

- The students will understand the basic concepts of general geology, ecology and phytogeography.
- Learn about the analyze and basic principles of geology.
- understand the importance of ecology and conservation

CO24: Paper XII: Plant Utilization

On completion of the course, students are able to

- Understand the role plants in human welfare.
- Gain knowledge about various plants of economic use.
- Know importance of plants & plant products.
- Understand the chemical contents of the plant products.
- Know about the utility of plant resources