

GOVT. DEGREE COLLEGE

NARASANNAPETA, SRIKAKULAM (DIST)



DEPARTMENT OF BOTANY

BOTANY COURSE OUTCOMES (COs)

2022-23

III B.Sc (CBZ) 2022-23

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GOVERNMENT DEGREE COLLEGE, NARASANNAPETA, SRIKAKULAM DIST.

DEPARTMENT OF BOTANY

Programme (B.Sc.) Objectives: The objectives of bachelor's degree programme with Botany are:

1. To provide a comprehensive knowledge on various aspects related to microbes and plants.
2. To deliver knowledge on latest developments in the field of Plant sciences with a practical approach.
3. To produce a student who thinks independently, critically and discuss various aspects of plant life.
4. To enable the graduate to prepare and pass through national and international examinations related to Botany.
5. To empower the student to become an employee or an entrepreneur in the field of Botany /Biology and to serve the nation.

Domain Subject (Botany) Objectives :

1. To impart knowledge on origin, evolution, structure, reproduction and interrelationships of microbes and early plant groups.
2. To provide knowledge on biology and taxonomy of true land plants within a phylogenetic framework.
3. To teach aspects related to anatomy, embryology and ecology of plants, and importance of Biodiversity.
4. To explain the structural and functional aspects of plants with respect to the cell organelles, chromosomes and genes, and methods of plant breeding.
5. To develop a critical understanding on SPAC, metabolism and growth and development in plants.
6. To enable the students proficient in experimental techniques and methods of analysis appropriate for various sub-courses in Botany.

Domain Subject (Botany) Outcomes:

1. Students will be able to identify, compare and distinguish various groups of microbes and primitive plants based on their characteristics.
2. Students will be able to explain the evolution of tracheophytes and also distribution of plants on globe.
3. Students will be able to discuss on internal structure, embryology and ecological adaptations of plants, and want of conserving Biodiversity.
4. Students will be able to interpret life processes in plants in relation to physiology and metabolism.
5. Students will be able to describe ultra structure of plant cells, inheritance and crop improvement methods.
6. Students will independently design and conduct simple experiments based on the knowledge acquired in theory and practicals of the different sub-courses in Botany.

BOTANY COURSE OUTCOMES (COs) - 2022-23

SEMESTER –I : Fundamentals of Microbes and Non-vascular Plants (Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)	<p>On successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Explain origin of life on the earth. • Illustrate diversity among the viruses and prokaryotic organisms and can categorizethem. • Classify fungi, lichens, algae and bryophytes based on their structure, reproduction andlife cycles. • Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi. • Recall and explain the evolutionary trends among amphibians of plant kingdom fortheir shift to land habitat. • Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.
SEMESTER –I : Practical syllabus of Fundamentals of Microbes and Non-vascular Plants (Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)	<p>On successful completion of this practical course, student shall be able to;</p> <ul style="list-style-type: none"> • Demonstrate the techniques of use of lab equipment, preparing slides and identifythe material and draw diagrams exactly as it appears. • Observe and identify microbes and lower groups of plants on their own. • Demonstrate the techniques of inoculation, preparation of media etc. • Identify the material in the permanent slides etc.
SEMESTER –II : Basics of Vascular plants and Phytogeography (Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)	<p>On successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Classify and compare Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycles. • Justify evolutionary trends in trachaeophytes to adapt for land habitat. • Explain the process of fossilization and compare the characteristics of extinct andextant plants. • Critically understand various taxonomical aids for identification of Angiosperms. • Analyze the morphology of the most common Angiosperm plants of their localitiesand recognize their families. • Evaluate the ecological, ethnic and economic value of different trachaeophytes, their goods and services for human welfare. • Locate different phytogeographical regions of the world and India and can analyzetheir floristic wealth.
SEMESTER –II : Practical syllabus of Basics of Vascular plants and Phytogeography (Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and	<p>On successful completion of this course students shall be able to:</p> <ul style="list-style-type: none"> • Demonstrate the techniques of section cutting, preparing slides, identifying of thematerial and drawing exact figures. • Compare and contrast the morphological, anatomical and reproductive features ofvascular plants. • Identify the local angiosperms of the families prescribed to their genus and specieslevel and prepare herbarium.

Phytogeography)	<ul style="list-style-type: none"> Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are. Prepare and preserve specimens of local wild plants using herbarium techniques
SEMESTER –III : Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	<p>On successful completion of this course, the students will be able to;</p> <ul style="list-style-type: none"> Understand on the organization of tissues and tissue systems in plants. Illustrate and interpret various aspects of embryology. Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and biotic factors on plant communities. Appraise various qualitative and quantitative parameters to study the population and community ecology. Correlate the importance of biodiversity and consequences due to its loss. Enlist the endemic/endangered flora and fauna from two biodiversity hot spots in India and assess Strategies for their conservation.
SEMESTER –III :Practical syllabus of Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	<p>On successful completion of this practical course students shall be able to:</p> <ul style="list-style-type: none"> Get familiarized with techniques of section making, staining and microscopic study of vegetative, anatomical and reproductive structure of plants. Observe externally and under microscope, identify and draw exact diagrams of the material in the lab. Demonstrate application of methods in plant ecology and conservation of biodiversity and qualitative and quantitative aspects related to populations and communities of plants.
SEMESTER –IV(P-IV) : Plant Physiology and Metabolism	<p>On successful completion of this course, the students will be able to;</p> <ul style="list-style-type: none"> Comprehend the importance of water in plant life and mechanisms for transport of water and solutes in plants. Evaluate the role of minerals in plant nutrition and their deficiency symptoms. Interpret the role of enzymes in plant metabolism. Critically understand the light reactions and carbon assimilation processes responsible for synthesis of food in plants. Analyze the biochemical reactions in relation to Nitrogen and lipid metabolisms. Evaluate the physiological factors that regulate growth and development in plants. Examine the role of light on flowering and explain physiology of plants under stress conditions.
SEMESTER –IV(P-IV) : Practical syllabus of Plant Physiology and Metabolism	<p>On successful completion of this practical course, students shall be able to:</p> <ul style="list-style-type: none"> Conduct lab and field experiments pertaining to Plant Physiology, that is, biophysical and biochemical processes using related glassware, equipment, chemicals

	<p>and plant material.</p> <ul style="list-style-type: none"> Estimate the quantities and qualitative expressions using experimental results and calculations Demonstrate the factors responsible for growth and development in plants.
SEMESTER –IV(P-V): Cell Biology, Genetics and Plant Breeding	<p>On successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Distinguish prokaryotic and eukaryotic cells and design the model of a cell. Explain the organization of a eukaryotic chromosome and the structure of genetic material. Demonstrate techniques to observe the cell and its components under a microscope. Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings. Elucidate the role of extra-chromosomal genetic material for inheritance of characters. Evaluate the structure, function and regulation of genetic material. Understand the application of principles and modern techniques in plant breeding. Explain the procedures of selection and hybridization for improvement of crops.
SEMESTER –IV(P-V) : Practical syllabus of Cell Biology, Genetics and Plant Breeding	<p>After successful completion of this practical course the student shall be able to:</p> <ul style="list-style-type: none"> Show the understanding of techniques of demonstrating Mitosis and Meiosis in the laboratory and identify different stages of cell division. Identify and explain with diagram the cellular parts of a cell from a model or picture and prepare models Solve the problems related to crosses and gene interactions. Demonstrate plant breeding techniques such as emasculation and bagging.
Skill Enhancement Courses(SECs) for Semester V from 2022-23 SEMESTER –V : Course-6A: Plant Propagation	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> Make use of different plant propagation structures for plant multiplication. Explore the specialized organs or asexual propagules in some plants for their proliferation. Demonstrate skills on micropropagation of plants through vegetative propagation techniques. Evaluate and use a suitable propagation technique for a given plant species.
Course 6A- Practical syllabus of Plant Propagation	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> Make use of different plant propagation structures for plant multiplication. Explore the specialized organs or asexual propagules in some plants for their proliferation. Demonstrate skills on micropropagation of plants through vegetative propagation techniques. Evaluate and use a suitable propagation technique for a given plant species.

Course 7A- Seed Technology	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Explain the causes for seed dormancy and methods to break dormancy. • Understand critical concepts of seed processing and seed storage procedures. • Acquire skills related to various seed testing methods. • Identify seed borne pathogens and prescribe methods to control them. • Understand the legislations on seed production and procedure of seed certification.
Course 7A- Practical syllabus of Seed Technology	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • Demonstrate skills on various methods to break the seed dormancy. • Determine seed moisture, seed germination percentage, seed viability and vigour. • Identify the seed borne pathogens and prescribe methods to prevent or control them. • Evaluate various methods to produce healthy seeds.
Course 6B: Vegetable Crops – Cultivation Practices	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Identify different vegetable plants and realize their value in human nutrition. • Analyse the types of soils to cultivate vegetable crops. • Demonstrate skills on agronomic practices for cultivation of vegetable crops. • Acquire knowledge on water, weed and disease managements in vegetable farming. • Comprehend aspects related to harvesting and storage of produce.
Course 6B: Practical syllabus of Vegetable Crops -Cultivation Practices	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • List out, identify and handle different garden implements. • Identify the important vegetable crops grown in their locality. • Demonstrate various skills in cultivation of vegetable crops. • Identify pests, diseases and their remedies that are specific to a vegetable crop.
Course 7B: Vegetable Crops – Post Harvest Practices	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Understand various practices for vegetable produce from harvesting to marketing. • Demonstrate skills on storage, processing and preservation of vegetables. • Summarize causes for spoilage of vegetables before and during storage and methods to prevent and control them. • Make use of preservation methods to reduce the loss of vegetable produce. • Explain about value added products, packaging and marketing of vegetables.

Course 7B: Practical syllabus of Vegetable Crops – Post Harvest Practices	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • List out, identify and handle different garden implements. • Identify the important vegetable crops grown in their locality. • Demonstrate various skills in cultivation of vegetable crops. • Identify pests, diseases and their remedies that are specific to a vegetable crop.
Course 6C: Plant Tissue Culture	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Comprehend the basic knowledge and applications of plant tissue culture. • Identify various facilities required to set up a plant tissue culture laboratory. • Acquire a critical knowledge on sterilization techniques related to plant tissue culture. • Demonstrate skills of callus culture through hands on experience. • Understand the biotransformation technique for production of secondary metabolites.
Course 6C: Practical syllabus of Plant Tissue Culture	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • List out, identify and handle various equipment in plant tissue culture lab. • Learn the procedures of preparation of media. • Demonstrate skills on inoculation, establishing callus culture and Micro propagation. • Acquire skills in observing and measuring callus growth. • Perform some techniques related to plant transformation for secondary Metabolite production.
Course 7C: Mushroom Cultivation	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Understand the structure and life of a mushroom and discriminate edible and poisonous mushrooms. • Identify the basic infrastructure to establish a mushroom culture unit. • Demonstrate skills preparation of compost and spawn. • Acquire a critical knowledge on cultivation of some edible mushrooms. • Explain the methods of storage, preparation of value-added products and marketing
Course 7C: Practical syllabus of Mushroom Cultivation	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • Identify and discriminate different mushrooms based on morphology.

	<ul style="list-style-type: none"> • Understand facilities required for mushroom cultivation. • Demonstrate skills on preparation of spawn, compost and casing material. • Exhibit skills on various cultivation practices for an edible mushroom
Course 6D: Gardening and Landscaping	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Acquire a critical knowledge about the aesthetic value, types and styles of gardens. • Perform field operations in a garden by understanding the role of a gardener. • Identify various ornamental plants and explain the growth habits. • Propagate garden plants through various propagation techniques. • Demonstrate skills of designing and developing a garden.
Course 6D: Practical syllabus of Gardening and Landscaping	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> • Perform various skills related to gardening. • Identify the living and non-living components required for garden development. • Identify the pests and diseases of garden plants and control the same. • Demonstrate skills of making bonsai and developing lawn. • Make landscape design using CAD.
Course 7D- Agroforestry	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> • Understand the concepts and economic value of agroforestry. • Acquire a critical knowledge on systems and design of agroforestry. • Explain silviculture practices in relation to agroforestry. • Understand the role of agroforestry to reclaim the waste lands. • Perform skills in relation to tree measurement techniques.
Course 7D- Practical syllabus of Agroforestry	<ul style="list-style-type: none"> • On successful completion of this practical course, student will be able to: • Identify suitable tree species for agro forestry and their products. • Demonstrate skills on raising tree species from seeds and by vegetative propagation. • Perform skills on measurements related to wood-based products. • Estimate biomass in an energy plantation.

III B.Sc (CBZ) 2022-23

SEMESTER – V

LONG TERM INTERNSHIP

SEMESTER – VI

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

REVISED UG SYLLABUS UNDER CBCS

(Implemented from Academic Year 2020-21)

PROGRAMME: FOUR YEAR B.Sc. (Hons)

Domain Subject: BOTANY

Skill Enhancement Courses (SECs) for Semester V, from 2022-23

Structure of SECs for Semester – V

(To choose One pair from the Four alternate pairs of SECs)

Univ. Code	Course NO. 6 & 7	Name of Course	Th. Hrs. / Week	IE Mar-ks	EE Mar-ks	Credits	Prac. Hrs./ Wk	Mar-ks	Credits
	6A	Plant Propagation	3	25	75	3	3	50	2
	7A	Seed Technology	3	25	75	3	3	50	2

OR

	6B	Vegetable Crops – Cultivation Practices	3	25	75	3	3	50	2
	7B	Vegetable Crops – Post Harvest Practices	3	25	75	3	3	50	2

OR

	6C	Plant Tissue Culture	3	25	75	3	3	50	2
	7C	Mushroom Cultivation	3	25	75	3	3	50	2

OR

	6D	Gardening and Landscaping	3	25	75	3	3	50	2
	7D	Agroforestry	3	25	75	3	3	50	2

Note-1: For Semester–V, for the domain subject Botany, any one of the four pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C or 6D & 7D. The pair shall not be broken (ABCD allotment is random, not on any priority basis).

Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations.