

# **GOVT. DEGREE COLLEGE**

**NARASANNAPETA, SRIKAKULAM (DIST)**



## **DEPARTMENT OF BOTANY**

### **BOTANY COURSE OUTCOMES (COs) and PROGRAM OUTCOMES (Pos) for**

**B.Sc Honours Botany**

**2024-25**

**S.PARAMESWARA RAO, LECTURER IN BOTANY**



## **Course Outcomes for B.Sc Honours Botany 2024-25**

### **Semester-1**

#### **COURSE 1 :INTRODUCTION TO CLASSICAL BIOLOGY**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Learn the principles of classification and preservation of biodiversity
2. Understand the plant anatomy, physiology and mushroom cultivation.
3. Learn animal physiology and economic importance of zoology.
4. Knowledge on cell division, heredity and origin of life.
5. Learn about chemistry in daily life and green chemistry.

### **Semester-1**

#### **COURSE:2 INTRODUCTION TO APPLIED BIOLOGY**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Knowledge on the contributions of microbiology.
2. Understand the structure and function of macromolecules.
3. Understand the applications of biotechnology in production of novel plants.
4. Knowledge on other techniques like immunological cytochemistry.
5. Understand the management of biological data in modern biology and medicine.

### **II Semester**

#### **Course3:Non-Vascular Plants (Algae,Fungi,Lichens and Bryophytes)**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. To learn significance and importance of Algae.
2. Knowledge on various groups of Algae.
3. Elaborate the lifecycles of fungal groups.
4. Compare and contrast the characteristics of different lichen members.
5. Summarize on evolution of saprophyte in bryophytes

## II Semester

### Course4: Origin of Life and Diversity of Microbes

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Knowledge on viral diseases and its control.
2. Learn on symbiotic bacteria.
3. Role on microorganisms on soil fertility.
4. Learn about the microbial pesticides.
5. To understand the diversity of microbial organisms

## III Semester

### Course 5: Vascular Plants (Pteridophytes, Gymnosperms and Taxonomy of Angiosperms)

1. Infer the evolution of vasculature, heterospory and seed habit in Pteridophytes.
2. Illustrate the general characteristics of Gymnosperms along with their uses
3. Compare and contrast the vegetative and floral characteristics of some angiospermic families
4. Evaluate the economic value of plant species from the families under the study.
5. Defend the utility of evidences from different branches of botany in solving the taxonomic lineages of some species.

## III Semester

### Course 6: Plant Pathology and Plant Diseases

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Identify major groups of plant pathogens and classify plant diseases.
2. Explain various stages in infection, plant pathogenesis and responsible factors.
3. Elaborate the preventive and control measures for plant diseases.
4. Discuss about some diseases of field crops and their management.
5. Discuss about some diseases of horticultural crops and their management.

## III Semester

### Course 7: Plant Breeding

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Compare and contrast the methods of reproduction and also pollination mechanisms.
2. Design appropriate pollination method for a given crop plant.
3. Recommend the best possible breeding method for a crop species.
4. Propose the steps for production of hybrid varieties of crop plants.
5. Apply molecular techniques to develop a tailored plant variety.

### **III Semester**

#### **Course 8: Plant Biotechnology**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Explain the scientific techniques and tools used in plant tissue culture laboratories.
2. Appraise the applications of plant tissue culture in agriculture and horticulture sectors.
3. Evaluate the role of transgenic plants in solving certain plant related beneficiary issues.
4. Justify the role of plant biotechnology in bioenergy and phytoremediation.
5. Judge the biosafety and bioethics related to plant biotechnology.

### **IV Semester**

#### **Course 9: Anatomy and Embryology of Angiosperms**

**Course Outcomes:**

1. Categorize various tissues and evaluate their role in plants.
2. Explain anomalous secondary growth in some plants and justify the value of timber plants.
3. Discuss the events in mega-sporogenesis and development of female gametophyte.
4. Propose the incidents in embryogenesis of an angiospermic plant species.
5. Compile the aspects of developmental and reproductive biology in plants.

### **IV Semester**

#### **Course 10: Plant Ecology, Biodiversity and Phytogeography**

**Course Outcomes:** On completion of this course students will be able to:

1. Explain the interactions among the biotic and abiotic components in an ecosystem.
2. Summarize the characteristics of a population and a community.
3. Anticipate the environmental problems arising due to climate change.
4. Assess the value of biodiversity and choose appropriate conservation strategy.
5. Make a survey on the distribution of various plant groups in a specified geographical area.

### **IV Semester**

#### **Course 11: Plant Resources and Utilization**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Explain the significance of plants in human nutrition.
2. List out different plant products used by human beings.
3. Evaluate the commercial plant products and their utilization
4. Discuss the uses of medicinal and aromatic plants for human health care.
5. Appraise the importance of timber and non-timber products for value added product

## **V Semester**

### **Course6C: Plant Tissue Culture**

**Course Outcomes:-**Students at the successful completion of the course will be able to:

1. Comprehend the basic knowledge and applications of plant tissue culture.
2. Identify various facilities required to setup a plant issue culture laboratory.
3. Acquire a critical knowledge on sterilization techniques related to plant tissue culture.
4. Demonstrate skills of callus culture through hands on experience.
5. Understand the biotransformation technique for production of secondary metabolites.

## **V Semester**

### **Course7C: Mushroom Cultivation**

**Course Outcomes:** Students at the successful completion of the course will be able to:

1. Understand the structure and life of a mushroom and discriminate edible and poisonous mushrooms.
2. Identify the basic infrastructure to establish a mushroom culture unit.
3. Demonstrate skills preparation of compost and spawn.
4. Acquire a critical knowledge on cultivation of some edible mushrooms.
5. Explain the methods of storage, preparation of value-added products and marketing.



## **Program Outcomes for B.Sc Honours Botany 2024-25**

### **PROGRAM OUTCOMES**

The students are expected to display the following outcomes after the completion of program

1. **Comprehensive Knowledge**: - Understanding in chosen discipline.
2. **Complex Problem Solving** :- Students should be able to demonstrate the ability to solve the different kinds of problem in real life situations
3. **Critical and Analytical Thinking** :-Students should analyze, evaluate and synthesize the knowledge from various sources.
4. **Creativity** :- Student should able to develop the ability to invent new techniques and solutions to solve problems effectively in unfamiliar situations.
5. **Communication Skills**:- The student should be able to demonstrate confidently the language skills in two or more languages.
6. **Research Ability** :- The student will acquire research temperament through observation, identification of problems and emerge with solutions.
7. **Team work & Leadership Skills** :- Students should effectively work in teams with Co-ordination and manifest leadership skills.
8. **Environment Consciousness and Sustainable Development** :-  
Students should able to develop awareness towards environmental issues and contribute in sustainable development.
9. **Responsible Citizenship** :- Students should exhibit moral behavior and have a sense of social and responsibility to build a strong nation and to preserve culture and heritage of the nation.
10. **Technological Aptitude** :- Students Acquire technical knowledge and skills to meet the Global needs.
11. **Financial Management and Entrepreneurship skills** :-  
Effective implementation of planning, mobilization and utilization of the financial resources becomes a good entrepreneur.
12. **Physical and Mental Wellbeing** :-Students should practice healthy living habits for Harmonious development of physical and mental wellness.

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**COURSE:2 INTRODUCTION TOAPPLIEDBIOLOGY**

[illegible]

## Course3: Non-Vascular Plants (Algae,Fungi,Lichens and Bryophytes)

[illegible]

[illegible][illegible]

### III Semester

### CO – PO MAPPING

[illegible]

### III Semester

### Course 7: Plant Breeding

### CO – PO MAPPING

[illegible]

### CO – PO MAPPING

### CO – PO MAPPING

[illegible]

### CO – PO MAPPING

### CO – PO MAPPING

[illegible]

### CO – PO MAPPING

**SEMESTER-V**  
**COURSE 7C: MUSHROOM CULTIVATION**  
**CO – PO MAPPING**

[illegible]

# **GOVT. DEGREE COLLEGE**

**NARASANNAPETA, SRIKAKULAM (DIST)**



**DEPARTMENT OF BOTANY**

**BOTANY COURSE OUTCOMES**

**(COs) for SEM-V**

**2024-25**

**S.PARAMESWARA RAO, LECTURER IN BOTANY**



**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.



## **SEMESTER – V B.Sc (CBZ)**

### **SEMESTER – VI**

### **(LONG TERM INTERNSHIP)**

### **Skill Enhancement Courses (SECs) for Semester V from 2024-25**

<b>Skill Enhancement Courses(SECs) for Semester V from 2022-23</b>  <b>SEMESTER –V :</b>  <b>Course-6A: Plant Propagation</b>	On successful completion of this practical course, student will be able to: <ul style="list-style-type: none"> <li>• Make use of different plant propagation structures for plant multiplication.</li> <li>• Explore the specialized organs or asexual propagules in some plants for their proliferation.</li> <li>• Demonstrate skills on micropropagation of plants through vegetative propagation techniques.</li> <li>• Evaluate and use a suitable propagation technique for a given plant species.</li> </ul>
<b>Course 6A- Practical syllabus of Plant Propagation</b>	On successful completion of this practical course, student will be able to: <ul style="list-style-type: none"> <li>• Make use of different plant propagation structures for plant multiplication.</li> <li>• Explore the specialized organs or asexual propagules in some plants for their proliferation.</li> <li>• Demonstrate skills on micropropagation of plants through vegetative propagation techniques.</li> <li>• Evaluate and use a suitable propagation technique for a given plant species.</li> </ul>
<b>Course 7A- Seed Technology</b>	Students at the successful completion of the course will be able to: <ul style="list-style-type: none"> <li>• Explain the causes for seed dormancy and methods to break dormancy.</li> <li>• Understand critical concepts of seed processing and seed storage procedures.</li> <li>• Acquire skills related to various seed testing methods.</li> <li>• Identify seed borne pathogens and prescribe methods to control them.</li> <li>• Understand the legislations on seed production and procedure of seed certification.</li> </ul>
<b>Course 7A- Practical syllabus of Seed Technology</b>	On successful completion of this practical course, student will be

	<p>able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate skills on various methods to break the seed dormancy.</li> <li>• Determine seed moisture, seed germination percentage, seed viability and vigour.</li> <li>• Identify the seed borne pathogens and prescribe methods to prevent or control them.</li> <li>• Evaluate various methods to produce healthy seeds.</li> </ul>
<b>Course 6B: Vegetable Crops – Cultivation Practices</b>	<p>Students at the successful completion of the course will be able to:</p> <ul style="list-style-type: none"> <li>• Identify different vegetable plants and realize their value in human nutrition.</li> <li>• Analyse the types of soils to cultivate vegetable crops.</li> <li>• Demonstrate skills on agronomic practices for cultivation of vegetable crops.</li> <li>• Acquire knowledge on water, weed and disease managements in vegetable farming.</li> <li>• Comprehend aspects related to harvesting and storage of produce.</li> </ul>
<b>Course6B: Practical syllabus of Vegetable Crops -Cultivation Practices</b>	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> <li>• List out, identify and handle different garden implements.</li> <li>• Identify the important vegetable crops grown in their locality.</li> <li>• Demonstrate various skills in cultivation of vegetable crops.</li> <li>• Identify pests, diseases and their remedies that are specific to a vegetable crop.</li> </ul>
<b>Course 7B: Vegetable Crops – Post Harvest Practices</b>	<ul style="list-style-type: none"> <li>• Students at the successful completion of the course will be able to:</li> <li>• Understand various practices for vegetable produce from harvesting to marketing.</li> <li>• Demonstrate skills on storage, processing and preservation of vegetables.</li> <li>• Summarize causes for spoilage of vegetables before and during storage and methods to prevent and control them.</li> <li>• Make use of preservation methods to reduce the loss of vegetable produce.</li> <li>• Explain about value added products, packaging and marketing of vegetables.</li> </ul>
<b>Course 7B: Practical syllabus of Vegetable Crops – Post Harvest Practices</b>	<p>On successful completion of this practical course, student will be able to:</p> <ul style="list-style-type: none"> <li>• List out, identify and handle different garden implements.</li> <li>• Identify the important vegetable crops grown in their locality.</li> </ul>

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

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

# **GOVT. DEGREE COLLEGE**

**NARASANNAPETA, SRIKAKULAM (DIST)**

## **DEPARTMENT OF BOTANY**



### **PROGRAMME OUTCOMES (POs), PROGRAMME SPECIFIC OUTCOMES (PSOs)**

### **B.Sc (CBZ)**

**S.PARAMESWARA RAO, LECTURER IN BOTANY**



## **DEPARTMENT OF BOTANY**

**Programme Outcomes (POs):** The undergraduate (UG) course offered by the Department of Botany, Government Degree College, and Narasannapeta follows the CBCS syllabus prescribed by the APSCHE. The course is a combination of general and specialized education, simultaneously introducing the concepts of breadth and depth in learning. The fundamental aim of UG course is to produce competent plant biologists who can employ and implement their gained knowledge in basic and applied aspects that will profoundly influence the prevailing paradigm of agriculture, industry, healthcare and environment to provide sustainable development. The present curriculum will not only advance their knowledge and understanding of the subject, but will also increase the ability of critical thinking, development of scientific attitude, handling of problems and generating solution, improve practical skills, enhance communication skill, social interaction, increase awareness in environment related issues and recognize the ethical value system. Additionally the training provided to the students will make them competent enough for doing jobs in Govt. and private sectors of academia, research and industry. Last and not the least to prepare the students for lifelong learning by drawing attention to the vast world of knowledge of plants and introducing them to the methodology of systematic academic enquiry.

1. Understand the basic concepts of Botany in relation to its allied core courses.
2. Perceive the significance of microbes and plants for human welfare, and structural and functional aspects of plants.
3. Demonstrate simple experiments related to plant sciences, analyze data, and interpret them with the theoretical knowledge.
4. Work in teams with enhanced inter-personal skills.
5. Develop the critical thinking with scientific temper.
6. Effectively communicate scientific ideas both orally and in writing.

**Programme Specific Outcomes (PSO):** The UG curriculum caters an all-round development of the student, rolling out globally ready individuals into the fast pacing world. The programme specific outcome includes:

1. Understanding the nature and basic concepts of all the plant groups, their metabolism, components at the molecular level, biochemistry, taxonomy and ecology.
2. The course will make them aware of natural resources and environment and the importance of conserving it.
3. Hands on training in various fields will develop practical skills, handling equipments and laboratory use along with collection and interpretation of biological materials and data.
4. Knowledge gained through theoretical and lab based experiments will generate technical personnel in various priority areas such as genetics, cell and molecular biology, plant systematics and biotechnology.

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