

## **PROGRAMME FILE**

### **About Department**

The department of botany was established in the year 1962, the first and foremost was headed by Sri. P. B. V. Raju, he worked for several years later headed by great personalities viz, Sri. J. Bharathi Devi, Dr. B. K. Raju, Sri. V. J. Raju, Dr. M. K. Lakshmi, Dr. C. V. Raju and Dr. S. Radha, and all other faculty Smt. V. Visalakshi, Smt. G. Ratnamala, who were worked as lecturers. Many dedicated teachers of the department inculcated value based botanical knowledge coupled with wisdom and skills to the learners during the past decades. From time to time new programmes were introduced to cater the needs of students. Currently Dr. V. Lakshminarayana, leading as in charge of the department and also blessed three lecturers with three doctorates and three APSET qualified faculty are Dr. B. Dileepu kumar, Sri. P. Sanyasirao and Dr. K. Prasanna Lakshmi. The department offering U. G. programme such as B. Z. C, later on U.G. (Honours) single major programme i.e., B.Sc., (Botany – Hon's. by Research) from the 2023-24 Academic Year as per the NEP-2020 regulations. The department offers courses of classical as well as modern branches of Botany to make work ready graduates and entrepreneurs. The departmental library is provided with more than one thousand reference books based on subject and also maintenance the personal library and two well established laboratories with full fledged equipment as well. We have excellent botanical garden with Medicinal, Ornamental and Wild plants supplying for the practical work and also have more than 150 specimens in the museum with well organized herbarium racks. The faculty members practicing various pedagogical tools for the over-all development of the students as per the college motto - 'Student First'. ICT facility is available for both staff and students in the department; it is engaged with the student-centered activities like field visits, seminars, workshops. The department aims to provide a green lung for the inhabitants of Vizianagaram. Gradually it became a dynamic and vibrant department.

**Vision:** To be a center of excellence for plant and microbial sciences.

**Mission:** To generate knowledge and produce researchers, leaders and graduates in various fields of plant and microbial sciences and biotechnology capable of providing solutions to industrial, health, agricultural and environmental challenges.

## **Core Values:**

- ❖ Professionalism and ethics
- ❖ Transformative education and research.
- ❖ Team work and partnership
- ❖ Environmental Sustainability and food security
- ❖ Equity and inclusiveness

### **1.1 GRADUATE ATTRIBUTES (GAs)**

The Graduate Attributes (GAs) reflect particular qualities and abilities of an individual learner including knowledge, application of knowledge, professional and life skills, attitudes and human values that are required to be acquired by the graduates of Maharajah's College. The graduate attributes include capabilities to strengthen one's professional abilities for widening current knowledge and industry-ready skills, undertaking future studies for global and local application, performing creatively and professionally, in a chosen career and ultimately playing a constructive role as a socially responsible global citizen. The Graduate Attributes define the characteristics of learners and describe a set of competencies that are beyond the study of a particular area and programme.

#### **The GAs**

- ❖ Continue life-long learning as an autonomous learner
- ❖ Continuously strive for excellence in education
- ❖ Apply and nurture critical and creative thinking
- ❖ Promote sustainable development practices
- ❖ Promote co-operation over competition
- ❖ Balance rights with responsibilities
- ❖ Understand and respect diversity & difference
- ❖ Not be prejudiced by gender, age, caste, religion, or nationality.
- ❖ Use education as a tool for emancipation and empowerment of humanity

## 2 .Programme Outcomes (PO's)

<b>PO No.</b>	<b>Component</b>	<b>Outcomes</b>
<b>PO1</b>	Basic Knowledge	Understanding of Plant Diversity and its importance in the maintenance of ecological balance.
<b>PO2</b>	In-depth Knowledge	Students learn to carry out practical work, in the field and in the laboratory, interpreting plant morphology and anatomy, Plant identification, Vegetation analysis techniques
<b>PO3</b>	Critical thinking and Problem-Solving abilities	Apply the knowledge of basic science, life sciences and fundamental process of plants..
<b>PO4</b>	Research aptitude and global competency	Apply modern techniques and instruments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological studies of plants with an understanding of the applications in human life.
<b>PO5</b>	Research aptitude and global competency	Ability to develop a research aptitude and apply knowledge to find the solution of burning research problems in the concerned and associated fields at global level.
<b>PO6</b>	Holistic and Multi-disciplinary education	Ability to gain knowledge with the holistic and multi-disciplinary approach across the fields.
<b>PO7</b>	Skills enhancement	Learn specific sets of disciplinary or multidisciplinary skills and Advanced techniques and apply them for betterment of mankind.
<b>PO8</b>	Leadership and Teamwork abilities	Ability to learn and work in a group and capable of leading a team even.
<b>PO9</b>	Ethical thinking and Social awareness	Inculcate the professional and ethical attitude and ability to relate with social problems. Learn important aspects associated with environmental and human health. Ability to develop eco-friendly technologies.
<b>PO10</b>	lifelong learning skills and Entrepreneurship	Ability to learn lifelong learning skills which are important to provide better opportunities and improve quality of life. Capable to establish independent start-up/innovation center etc.

## 2.1. PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO No.	Programme Specific Outcomes
<b>PSO1</b>	Critical evaluation of ideas and arguments by collecting relevant information about the plants, so as to recognize their position in the classification systems and at phylogenetic level
<b>PSO2</b>	Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works and they can also do practically
<b>PSO3</b>	Students will be able to compare and contrast the morphological and anatomical characteristics of the different groups of plants such as algae, fungi, bryophytes, Pteridophytes, gymnosperms and angiosperms including their anomalies.
<b>PSO4</b>	Students can identify the various pathogens causes to common plant diseases with and their control measures
<b>PSO5</b>	Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth ,plant growth and development
<b>PSO6</b>	Students will be able to explain how Plants function at gene, genome, molecular cellular, tissue level metabolic processes and growth and development
<b>PSO7</b>	Students will be will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems and also knows value and demand of sustainability in forming systems for food safety and security .
<b>PSO8</b>	Students will be able to conceive the idea of reproduction of plants plant breeding along with reproductive methods in plants, production of new varieties and comprehensive knowledge on tools and techniques in plant breeding and also conceive the idea of artificial propagation of plants via vegetative methods and to find a livelihood via establishing miniature plant nurseries.
<b>PSO9</b>	Students will be able to establish entrepreneurship units for self employment, in fields of tissue culture , mushroom culture, Nursery development Floriculture and Organic forming.

### 2.3. MAPPING OF PROGRAMME OUTCOMES WITH PROGRAMME SPECIFIC OUTCOMES

S. No.	PSOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9
	POs									
1.	<u>PO1</u>	✓	✓	✓	✓		✓	✓	✓	✓
2.	<u>PO2</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.	<u>PO3</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.	<u>PO4</u>		✓	✓	✓		✓	✓	✓	✓
6.	<u>PO6</u>		✓	✓	✓		✓	✓	✓	✓
5.	<u>PO5</u>		✓	✓	✓		✓	✓	✓	✓
7.	<u>PO7</u>			✓	✓			✓	✓	✓
8.	<u>PO8</u>		✓	✓			✓	✓	✓	✓
9.	<u>PO9</u>		✓	✓	✓		✓	✓	✓	✓
10	<u>PO10</u>		✓	✓	✓		✓	✓	✓	✓

### 2.4. MAPPING OF COURSE WITH PROGRAMME SPECIFIC OUTCOMES

year	semes ter	course	PSOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
			Name of the Course										
1st	I	1	Introduction to Classical Biology	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		2	Introduction to Applied Biology	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	II	3	Non-vascular Plants –(T)	✓	✓	✓				✓			
			Non-vascular Plants –(P)	✓	✓	✓	✓			✓			
		4	Origin of Life and Diversity of Microbes –(T)	✓	✓			✓	✓				
			Origin of Life and Diversity of Microbes –(P)	✓	✓			✓	✓				
	2nd	III	5	Vascular Plants –(T)	✓	✓	✓			✓	✓		
				Vascular Plants –(P)	✓	✓	✓				✓		
6			Plant Pathology and Plant Diseases–(T)	✓	✓		✓		✓				

3rd	IV		Plant Pathology and Plant Diseases –(P)	✓	✓	✓	✓		✓					
		7		Plant Breeding–(T)	✓	✓				✓	✓	✓	✓	
				Plant Breeding –(P)	✓	✓				✓	✓	✓	✓	
		8		Plant Biotechnology–(T)	✓	✓		✓	✓	✓	✓	✓	✓	
				Plant Biotechnology–(P)	✓	✓		✓	✓	✓	✓	✓	✓	
		9		Anatomy and Embryology of Angiosperms–(T)	✓	✓	✓	✓			✓	✓		
				Anatomy and Embryology of Angiosperms–(P)	✓	✓	✓	✓			✓	✓		
			10		Plant Ecology, Biodiversity and Phytogeography–(T)	✓	✓	✓		✓	✓	✓	✓	
				Plant Ecology, Biodiversity and Phytogeography–(P)	✓	✓	✓		✓	✓	✓	✓		
	11			Plant Resources and Utilization–(T)	✓	✓	✓					✓		
				Plant Resources and Utilization–(P)	✓	✓	✓					✓		
	V	12		Cell Biology and Genetics–(T)	✓	✓			✓	✓				
				Cell Biology and Genetics–(P)	✓	✓			✓	✓				
		13		Plant Physiology and Metabolism–(T)	✓	✓				✓				
				Plant Physiology and Metabolism–(P)	✓	✓				✓				
14			Organic Farming–(T)	✓	✓						✓	✓		
			Organic Farming–(P)	✓	✓						✓	✓		
15			Mushroom Culture Technology–(T)	✓	✓			✓	✓				✓	
			Mushroom Culture Technology–(P)	✓	✓			✓	✓				✓	

### **3. STRUCTURE OF THE PROGRAMME (INSTRUCTION & EXAMINATION)**

#### **First year Semester-I**

<b>S. No.</b>	<b>Paper Title</b>	<b>Course type</b>	<b>Instruction periods per week</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>	
<b>1</b>	Introduction to Classical Biology	Major 1	5	60	30	100	4	
<b>2</b>	Introduction to Applied Biology	Major 2	5	60	30	100	4	
<b>3</b>	A Course in Communication and Soft Skills	Language I English	4	60	30	100	3	
<b>4</b>	<b>Telugu Sahiti Sourabham</b>	<b>Sanskrit Poetry, Prose &amp; Grammar –I</b>	Language II	4	60	30	100	3
<b>5</b>	Analytical Skills	Skill course I	2	30	20	50	2	
<b>6</b>	Communication Skills	Skill course II	2	30	20	50	2	
<b>7</b>	Introduction to Social Work	MDC	2	30	20	50	2	
			24		Total		20	

## Semester-II

S. No.	Paper Title		Course type	Instruction periods per week	External Marks	Internal Marks	Total Marks	Credits
1	Non-vascular Plants		Major-3 Botany	3	60	40	100	3
			Major-3 Lab	2	30	20	50	1
2	Origin of Life and Diversity of Microbes		Major-4 Botany	3	60	40	100	3
			Major-4 Lab	2	30	20	50	1
3	Zoology Animal Diversity- I Biology of Non Chordates	Chemistry General & Inorganic Chemistry	Minor- I	3	60	40	100	3
			Minor- I Lab	2	30	20	50	1
4	A Course in Reading & Writing Skills		Language I English	4	60	30	100	3
5	Telugu	Sanskrit	Language II	4	60	30	100	3
6	Business Writing		Skill course I	2	30	20	50	2
7	Digital Literacy		Skill course II	2	30	20	50	2
<b>Total</b>				27	Total credits			22

Community Service Project (CSP)	Period of CSP	External Marks	Internal Marks	Total Marks	Credits
	180hours				

**Second Year****Semester-III**

	<b>Paper Title</b>		<b>Course type</b>	<b>Instruction periods per week</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
1	Vascular Plants		Major-5 Theory	3	60	40	100	3
			Major-5 Lab	2	30	20	50	1
2	Plant Pathology and Plant Diseases		Major-6 Theory	3	60	40	100	3
			Major-6 Lab	2	30	20	50	1
3	Plant Breeding		Major-7 Theory	3	60	40	100	3
			Major-7 Lab	2	30	20	50	1
4	Plant Biotechnology		Major-8 Theory	2	30	20	50	3
			Major-8 Lab	3	60	40	100	1
5	Zoology Animal Diversity-II Biology of Chordates	Chemistry Fundamentals in Organic Chemistry	Minor-2 Theory	3	60	40	100	3
			Minor-2 Lab	2	30	20	50	1
6	Information and Communication Technology		Skill course I	2	30	20	50	2
7	Introduction to Public Administration		MDC	2	30	20	50	2
Total				29	Total			24

**SEMESTER-IV**

	<b>Paper Title</b>	<b>Course type</b>	<b>Instruction periods per week</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>	
1	Anatomy and Embryology of Angiosperms	Major-9 Theory	3	60	40	100	3	
		Major-9 Lab	2	30	20	50	1	
2	Plant Ecology, Biodiversity and Phytogeography	Major-10 Theory	3	60	40	100	3	
		Major-10 Lab	2	30	20	50	1	
3	Plant Resources and Utilization	Major-11 Theory	3	60	40	100	3	
		Major-11 Lab	2	30	20	50	1	
4	Zoology Embryology	Chemistry Physical Chemistry-II	Minor-3 Theory	3	60	40	100	1
			Minor-3 Lab	2	30	20	50	1
5	Zoology Animal Physiology	Chemistry General & Physical Chemistry	Minor-4 Theory	3	60	40	100	3
			Minor-4 Lab	2	30	20	50	1
6	Cyber Security	Skill course I	2	30	20	50	2	
7	Indian Philosophy	MDC	2	30	20	50	2	
Total			29	Total			24	

<b>INTERNSHIP-II</b> Short-Term Internship / Apprenticeship/ OJT	<b>Instruction periods per week</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
		<b>8 Weeks</b>	<b>100</b>	<b>50</b>	<b>150</b>

**Third Year****Semester-V**

	<b>Paper Title</b>		<b>Course type</b>	<b>Environmental Education</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
1	Cell Biology and Genetics		Major-12 Theory	3	60	40	100	3
			Major-12 Lab	2	30	20	50	1
2	Plant Physiology and Metabolism		Major-13 Theory	3	60	40	100	3
			Major-13 Lab	2	30	20	50	1
3	Organic Farming		Major-14 Theory	3	60	40	100	3
			Major-14 Lab	2	30	20	50	1
4	Mushroom Culture Technology		Major-15 Theory	3	60	40	100	3
			Major-15 Lab	2	30	20	50	1
5	Zoology Poultry Management -I (Poultry Farming)	Chemistry Analytical Methods in Chemistry-Quantitative analysis	Minor-5 Theory	3	60	40	100	1
			Minor-5 Lab	2	30	20	50	1
6	Zoology Poultry Management -II (Poultry Farming)	Chemistry Chromatography and Instrumental methods of Analysis	Minor- 6 Theory	3	60	40	100	3
			Minor- 6 Lab	2	30	20	50	1
7	Environmental Education		Skill course	2	30	20	50	2
<b>Total</b>				<b>32</b>	<b>Total</b>			<b>26</b>

**SEMESTER-VI**

<b>INTERNSHIP-III FOR A PERIOD OF 16 WEEKS (Long –Term)</b>	<b>External Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
	<b>150</b>	<b>50</b>	<b>200</b>	<b>12</b>