	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	TECHNIQUES IN NURSERY DEVELOPMENT				
Teaching	Hours Allocated: 60 (Theory)	L	T	P	C
Pre-requisites:		3	-	-	4

Course Objectives:

This course aims to introduce fundamentals of Nursery development. The course will also give an insight in Various techniques used in nursery development and management practices

Outcomes:

OnCompletionofthe course,thestudentswillbeableto-	
CO1	Understand different types of nurseries
CO2	Identify various facilities required to set up of a nursery.
CO3	Understood expertise related to various practices in a nursery.
CO4	Acquire skills to get an employment or to become an entrepreneur.

SkillDevelopment			Employability			Entrepreneurship	
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Syllabus:

UNIT-I:

Introduction to Nursery:

- 1.1 Definition, objectives and importance.
- 1.2 Basic requirements for a nursery layout and components of a good nursery.
- 1.3 Types of nurseries.
- 1.4 Bureau of Indian standards (BIS - 2008) related to nursery.

UNIT-II:

Nursery inputs

- 2.1 Tools, implements and containers.
- 2.2 Nursery media.
- 2.3 Electricity, equipment and machinery management.
- 2.4 Types of nursery beds and their preparations.
- 2.5 Precautions and maintenance of nursery beds.

UNIT-III:

Seeds and Propagules

- 1.1 Selection of seed and different sowing methods.
- 1.2 Use of different plant parts for vegetative propagation to raise nursery.
- 1.3 Different techniques of vegetative propagation.

UNIT-IV:

Management Practices

- 4.1 Routine seasonal operations in a nursery.
- 4.2 Supply of water, nutrients and removal of weeds.
- 4.3 Identification of pests and diseases, control and prevention methods.

UNIT – V

Grafting techniques

- 1.1 Introduction to grafting, definition, types and tools for grafting.
- 1.2 Steps involved in simple, splice graft, tongue graft, Whip graft, cleft graft and wedge graft.
- 1.3 Grafting of horticultural & floricultural crops and applications

Textbooks

1. Ratha Krishnan, M., et al. (2014) Plant Nursery
2. P.K.Ray, (2020) Essentials of plant nursery management.
3. P.K.Ray, (2012) How to start and operate a Plant Nursery.

Referencebooks:

4. Management: Principles and Practices, Central Arid Zone Research Institute – ICMR, Jodhpur, Rajasthan.
5. Vikas Kumar, Anjali Tiwari, Practical manual of Nursery management, Agri – biotech Press, New Delhi.
- 6.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate[Medium]; 3:Substantial[High];, No Correlation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PS01	PS02	PS03
CO1	3	2	3	3	3	2	2	2	3	2	3	3	2
CO2	3	3	2	2	3	3	3	2	2	1	1	1	2
CO3	2	3	3	2	2	2	2	3	2	3	1	1	1
CO4	3	2	3	3	3	2	2	2	3	2	3	3	2

P.R. GOVERNMENT COLLEGE (A): KAKINADA

Semester-V

PAPER 6A TECHNIQUES IN PLANT NURSERY DEVELOPMENT

MODEL PAPER

PART-I

Answer any **THREE** questions by attempting at least **ONE** question from each section.

SECTION – A

3 X 10 = 30 Marks

1. Explain Bureau of Indian standards related to Nursery.
2. Write an essay on necessary precautions to be taken in the maintenance of nursery beds.
3. Explain the different techniques involved in asexual propagation

SECTION – B


4. Write about the control and prevention of pests.
5. Describe the Grafting of horticultural and floricultural crops.
6. Write an essay on different tools for land preparation in a plant nursery.

PART – II

Answer any **SIX** Questions from the following


6 X 5 = 30 Marks

7. Write a note on basic requirements of a nursery
8. Explain about any two types of nurseries
9. Describe the nursery media
10. Write a short note on selection of seed
11. Types in grafting
12. Tongue graft
13. Tools in nursery
14. sowing methods
15. different types in nursery beds
16. Seed selection.

	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	TECHNIQUES IN NURSERY DEVELOPMENT				
Teaching	Hours Allocated: 30 (Lab)	L	T	P	C
Pre-requisites:		-	-	2	1

Practical syllabus:

1. Demonstration of different types of nurseries.
2. Handling of nursery tools, equipment and types of containers.
3. Laying of nursery bed with soil and compost.
4. Seed collection, treatment and rising of seedlings on nursery bed.
5. Handling of grafting and layering techniques in the nursery.
6. Watering, weeding and management of nursery.
7. Maintaining of the seedlings / cuttings in the nursery.

	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	TECHNIQUES IN NURSERY DEVELOPMENT				
Teaching	Hours Allocated: 30 (Lab)	L	T	P	C
Pre-requisites:		-	-	2	1

Question Paper Model for Practical Examination

Semester – V

Biotechnology Course – 6 A (Skill EnhancementCourse) Techniques in Nursery Development

Max. Time: 1 1/2 Hrs.

Max. Marks: 35

- I a. Perform the pre-treatment method for given seed 'A' }
 b. Identify the graft and perform grafting 'B' }

16M


- II. Scientific observation and data analysis

3 x 3 = 9 M

- A. Whip graft/photograph
- B. Propagule / photograph
- C. Nursery container/ photograph

- III. Record + Viva-voce

6+4 = 10 M

	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	HYDROPONICS CULTIVATION				
Teaching	Hours Allocated: 60 (Theory)	L	T	P	C
Pre-requisites:		3	-	-	4

Course Objectives:

This course aims to introduce fundamentals hydroponics. The course will also give an insight in Various techniques used in hydroponics cultivation system.

Outcomes:

On Completion of the course, the students will be able to-

CO1	Understand the concept of hydroponics.
CO2	Acquire the knowledge on soilless cultivation system.
CO3	Prepare media for hydroponics cultivation.
CO4	Learn the hydroponic cultivation technique.

SkillDevelopment		Employability		Entrepreneurship	
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Syllabus:

UNIT-I:

Introduction to Soilless culture

- 1.1 Definition, History and origin of soilless culture.
- 1.2 Present status of hydroponics-contrasts with soil based culture.
- 1.3 Applications & future developments.

UNIT-II:

Macronutrients, micronutrients

- 2.1 Functions and effect on plants, deficiency symptoms of the following essential minerals N, P, Mg, Ca, K, S, Fe, Mn, Cu, Zn, B, Mo.
- 2.2 Physical factors, light (Quantity, energy, photoperiodism etc)
- 2.3 Temperature (Heating and cooling), Humidity, CO₂, ppm, pH and TDS.

UNIT-III:

Cultural conditions

- 1.1 Plant nutrition. Inorganic salts (fertilizers) major and minor nutrients formulating, monitoring and analysing.
- 1.2 Selection of fertilizers, media used for hydroponics-expanded clay, rock wool, coir, perlite, pumice, vermiculite, sand gravel etc.
- 1.3 Weed management, diseases and pest control.

UNIT-IV:

Techniques in hydroponics

- 4.1 Static solution culture
- 4.2 Continuous-flow solution culture
- 4.3 Aeroponics

UNIT – V

Cultivation of crop plants by hydroponics

- 6.1 Passive sub-irrigation, Ebb and flow or flood and chain irrigation.
- 6.2 Deep water culture protocols for –Tomato cultivation through Dutch bucket method
- 6.3 Chilly cultivation through NFT system, Spinach through raft System and measurements of yield.

Textbooks :

1. Prasad S and Kumar U. Green House management for Horticultural crops. Agro-Bios India.
2. Dahama A.K. Organic Farming for Sustainable Agriculture. Agrobios, India
3. Subba Rao N.S. (1995). Biofertilizers in Agriculture and Forestry. Oxford and IBH Publishing Company. Pvt. Ltd New Delhi.

Referencebooks:

4. Keith Roberto, How to Hydroponics. The future Garden Press New York. 4th Edition
5. Howard M. Resh. Hobby Hydroponics. CRC Press, USA.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate[Medium]; 3: Substantial[High];, No Correlation]

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	3	3	3	2	2	2	3	2	3	3	2
CO2	3	3	2	2	3	3	3	2	2	1	1	1	2
CO3	3	2	3	3	3	2	2	2	3	2	3	3	2
CO4	2	3	3	2	2	2	2	3	2	3	1	1	1

P.R. GOVERNMENT COLLEGE (A): KAKINADA

Semester-V

HYDROPONICS CULTIVATION

MODEL PAPER

PART-I

Answer any **THREE** questions by attempting at least **ONE** question from each section.

SECTION – A

3 X 10 = 30 Marks

1. Describe the applications and future developments of hydroponics.
2. Explain the deficiency symptoms of the Macro nutrients.
3. Explain in detail about the control of hydroponic pests

SECTION – B


4. Discuss about the technique of static solution culture in hydroponics.
5. Explain the process of tomato cultivation through Dutch bucket method.
6. Explain in detail about the different types of media used for hydroponics.

PART – II

Answer any **SIX** Questions from the following


6 X 5 = 30 Marks

7. Application of Hydroponics
8. Role of micro nutrients
9. Weed management
10. Solid state culture
11. Raft hydroponics
12. Photoperiodism
13. Aeroponics
14. TDS
15. Dutch bucket method
16. vermiculture

	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	HYDROPONICS CULTIVATION				
Teaching	Hours Allocated: 30 (Lab)	L	T	P	C
Pre-requisites:		-	-	2	1

Practical syllabus:

1. Handling of tools required for hydroponic set up.
2. Preparation of macronutrients and micronutrients solutions/stock cultures.
3. Preparation of different media for hydroponic system.
4. Evaluating the effect of bio fertilizers on hydroponic cultivation.
5. Weeding management techniques - demonstration.
6. Demonstration of pests and diseases control and prevention methods.
7. Cultivation of tomato by hydroponic system.
8. Cultivation of chilli through hydroponic cultivation.

	Pithapur Rajah's Government College(Autonomous)Kakinada	Program &Semester III B.Sc Semester -V			
CourseCode	HYDROPONICS CULTIVATION				
Teaching	Hours Allocated: 30 (Lab)	L	T	P	C
Pre-requisites:		-	-	2	1

Question Paper Model for Practical Examination

Semester – V

Biotechnology Course – 7 A (Skill EnhancementCourse) Hydroponics cultivation

Max. Time: 1 1/2 Hrs.

Max. Marks: 35

- | | |
|--|-------------|
| 1. Prepare complete media for effective hydroponic cultivation | 16 M |
| 2. Scientific observation and data analysis | 3 x 3 = 9 M |
| A. Chilli cultivation /photograph | |
| B. Tomato cultivation / photograph | |
| C. Zinc deficiency symptom / photograph | |
| 3. Record + Viva-voce | 6+4 = 10 M |