



AMITY UNIVERSITY
 ——— UTTAR PRADESH ———

FORMAT FOR COURSE CURRICULUM

Course Title: Plant Biotechnology

Course Code: BIOT203

Credit Units: 4

Level: UG

L	T	P/S	SW/ FW	TOTAL CREDIT UNITS
2	-	1	1	4

Course Objectives:

Theory: The course aims to make the students understand the basic techniques of plant tissue culture. Knowledge of Plant cell and tissue culture is fundamental to any plant genetic engineering and crop improvement. The subject will give special emphasis to commercial applications of Plant tissue culture and its opportunities in employment, research and development

Practical: To train students in handling experimental methods relevant to Plant tissue culture and transformation

Pre-requisites: Knowledge in plant Sciences

Student Learning Outcomes:

The student will be able to know about

- Various steps taken to establish and optimize media for specific purposes.
- Maintain plants in tissue culture.
- Tissue culture in genetic transformation.
- Over all experimental work, analyze the data and draw appropriate conclusions

Course Contents/Syllabus- Theory:	Weightage (%)
<p>Module I Descriptors/Topics Module I Introduction to Plant Tissue Culture</p> <p>Historical perspective of plant tissue culture. Concept of totipotency : Dedifferentiation and redifferentiation</p> <p>Media composition: Types of nutrient media and role of phytohormones.</p> <p>Cell culture techniques: Cell, tissue, organ cultures, callus culture, suspension culture, protoplast culture.</p> <p>Plant regeneration pathways: Organogenesis and somatic embryogenesis.</p>	<p>30</p>
<p>Module II Descriptors/Topics: Applications of Plant Tissue and Cell culture</p> <p>Micropopogation, artificial seed production, pathogen free plants. Production of haploids and triploids.</p> <p>Somaclonal variation. Somatic hybridization. Cybrid production. Preservation of germplasm-Slow growth cultures and cryopreservation.</p>	<p>20</p>
<p>Module III Descriptors/Topics: Plant Transformation</p> <p>Genetic engineering in plants. Transformation vectors.</p> <p>Gene transfer techniques-vector mediated and vector less gene transfer.</p> <p>Transgenic plants, trans gene integration and expression</p>	<p>25</p>

Module IV Descriptors/Topics: Commercial aspects of Plant Biotechnology Transgenic crops with new traits-herbicide tolerance, insect and disease resistance, Therapeutic proteins and compounds Edible vaccines Production of secondary metabolites via tissue culture Bioethics of plant genetic engineering.	25
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Practical- List of Experiments:

- Sterilization of glassware and equipments.
- Preparation of cotton plugs
- Preparation of stocks for culture media
- Preparation of culture media
- Preparation and sterilization of different explants
- Inoculation of explants on culture media
- Study of viability of seeds
- Embryo culture

Pedagogy for Course Delivery:

Lectures: 40

Tutorial: -

Presentation/ Seminar: -4

Class Test: 1

Total: 45

Lab/ Practical details, if applicable:

Tutorial: -

Practical: 26

Class Test: 4

Total: 30

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
75	25	100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Class Test 1	Class Test 2	Home Assignment	Attendance	
Weightage(%)	10	10	5	5	70

Lab/ Practical/ Studio Assessment:

	CE			End Term Examination			
Components (Drop down)	Performance	viva	Attendance	Lab record	Performance	Viva	Total
Weightage (%)	15	10	5	10	40	20	100

Text & References:

- Plant Biotechnology: The Genetic Manipulation in Plants 2008 2ND (Ed) A. Slater, Scott N.W. and Fower M.R. Oxford press.
- An Introduction to Plant Tissue Culture, 2006 , 2nd 9 (Ed.) M.K. Razdan, Oxford and IBH Publishing
- Plant Tissue Culture: Theory & Practice,1996, 2nd (Ed) S.S. Bhojwani and M.K. Razdan, Elsevier Health Sciences

Remarks and Suggestions:**Date:**

Name, Designation, Organization