

AMITY UNIVERSITY

#### Annexure 'CD – 01'

## Course Title: Applications of RDT in Plant Tissue Culture

Course Code:GCMB608

Credit Units: 3

Level: PG Diploma

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2	-	02	-	3

#### **Course Objectives:**

The main objective of this course is to provide an introduction and understanding of principles and fundamentals of recombinant DNA technology including a preface to the recent advancements. The course aims to provide knowledge of, and practical skills of recombinant DNA technology which have greatly revolutionized the biotech industry and modern science. The course is also a prelude to advance courses such as Genomics

Prerequisites: Genetics and Molecular Biology

### **Student Learning Outcomes:**

- Students will be able to describe various tools and methodologies used in recombinant DNA technology.
- Students will be able to distinguish experiments to address a question and apply their theoretical and practical knowledge to problem solving, and evaluate the experimental data to reach a conclusion.
- Actual experience in experiments will make them to comprehend the subject better.
- With developed skills students are expected to perform routine DNA analysis, perform cloning experiments and use logical understanding to design and execute an experiment.
- Students will be able to predict and apply recombinant DNA technology for improvement of crops and animals.

Course Contents/Syllabus	Weghtage
Module I : Enzymes	15%
• Restriction endonucleases, ligase, polymerases, kinase, phosphatase, nuclease, terminal deoxynucleotidyl transferase, reverse transcriptase, topoisomerase	
linkers and adaptors.	
Module II : Cloning vectors	15%
<ul> <li>Cloning vectors based on Plasmids</li> <li>Expression vectors; Shuttle vectors</li> </ul>	
Module III :	30%
<ul> <li>Gene cloning, construction of Genomic DNA and cDNA libraries. Methods of selection and screening for recombinant DNA;</li> <li>analysis of the transformed plants, DNA and RNA extraction, Gene cloning, design of inserts, selection and use of vectors, screening of clones; Southern, and Western blotting techniques</li> </ul>	

Radioactive	e and non-rad	ioactive prob	es					
Module IV:							10%	
Gene expression a	nalysis: North	ern blotting,	RT-PCR,					
Module V. Polym	erase Chain	Reaction					15%	
Principles a	and applicatio	ns of PCR				_	1370	
• Types of Po	CR							
Module VI : Sequ	encing of DN	IA					15%	
• Maxam-Gi	lbert, Sanger'	s and automa	ted DNA se	quencing met	thod			
• Introductio	n to next-gene	eration seque	ncing.					
List of Experimer	nts:							
Analys	is of DNA by	gel electroph	oresis					
Kestrici     Ligation	tion digestion							
Prepara	tion of comp	etent cells						
Bacteri	al transformat	tion						
Polyme	rase chain rea	chain reaction						
Prepara	tion of construc	t						
Pedagogy for Cou	rse Deliverv	•						
Lectures : 29	J							
Class test:01								
Total : 30	/ D							
Tutorial: 0	Practicals:							
Practical: 2	8							
Class Test:	01							
Viva: 01								
Total: 30								
Assessment/ Exan	nination Sch	eme:						
Theory L/T (%)	Lab/P	ractical/Studio	0 (%)	Total				
67		33			100			
Theory Assessment	: (L&T):							
Conti	inuous Assessr	nent/Internal	Assessment					
Components								
(Drop down)								
	Mid-Term	Project	Viva	Attendanc	End Term	Total		
	Exam			e	Examination			
Weightage (%)								
	10	10	~		70	100		
	10	10	5	5	/0	100		
Lab/ Practical/ Stu	dio Assessmen	t:			1			

	Continuous Assessment/Internal Assessment			End Term Examination				
Components (Drop	Clas s test	Lab record	Viva	Attendance	Performance	Lab Record	Viva	Total
Weightage	15	5	5	5	40	10	20	100

# • Pedagogy for Course Delivery: Interactive classroom teaching from text books, published reviews and articles

Text:

1. Gene Cloning and DNA Analysis: An Introduction, 6th Edition, T. A. Brown, 2010,

Wiley-Blackwell. ISBN: 978-1-4051-8173-0

2. Principles of Gene Manipulation: An Introduction to Genetic Engineering, 6th edition,

Sandy Primrose, Richard Twyman, Bob Old 2001.Blackwell Science ISBN: 978-1-405-13544-3

3.Molecular Cloning: A Laboratory Manual,4th Edition, J. Sambrook, E.F. Fritsch and T.

Maniatis, 2012 Cold Spring Harbor Laboratory Press. ISBN: 978-1-936113-41-5