Title of the Course: GENETIC ENGINEERING [P]

Course Code: MIC-624

Number of Credits: 1, Practical

Contact hours: 30

Effective from Academic Year: 2022-23

Prerequisites	Theoretical understanding of chromosomal DNA, plasmid DNA, selection media and preparatory microbiology.	
Objective:	• Hands-on experience of the workflow of a typical genetic engineering experiment.	
Content:		**(30)**
1.	Restriction mapping of bacterial plasmid.	
2.	Assessment of DNA ligation activity of T4 DNA ligase	
3.	Preparation of competent cells and transformation of *E. coli* host with plasmid DNA using heat shock method and electroporator; confirmation of positive transformants by blue-white screening.	
4.	Demonstration of insertional inactivation of marker gene.	
Pedagogy:	Experiments in the laboratory	
References/ Readings	• Brown, T.A., Gene cloning and DNA Analysis: An Introduction, Blackwell Science (2020).	
	• Davis, L. G., Dibner, M. D. & Battey, J. F., Basic Methods in Molecular Biology, Elsevier (1994).	
	• Gerhardt, P., Methods for General and Molecular Bacteriology, Elsevier (2007).	
	• Glick, B.R., Pasternak, J.J. & Patten, C.L., Molecular Biotechnology: Principles and Applications of Recombinant DNA, ASM Press (2022).	
	• Glover, D. M., Gene cloning: The Mechanics of DNA Manipulation, Springer-Science+Business Media, B. V (2013).	
	• Green, M.R. & Sambrook, J., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, New York (2012).	
	• Grinsted, J. & Bennett, P.M., Methods in Microbiology, Vol. 21, Plasmid Technology, Academic Press (1990).	
	• Old, R.W. and Primrose, S.B., Principles of Gene Manipulation: An introduction to Genetic Engineering, University of California Press (2014).	
	• Williamson, R., Genetic Engineering, Volumes 4-7, Academic Press (1997).	
Course Outcomes	• Apply the technique of restriction mapping; • Clone a desired gene in a prokaryotic system. • Interpret experimental results on the basis of gel profiles. • Design experiments for obtaining specific outcomes in gene cloning and expression.	