Title of the Course: MOLECULAR BIOLOGY [P]

Course Code: MIC-513
Number of Credits: 1, Practical
Contact hours: 30
Effective from Academic Year: 2022-23

Prerequisites	It is assumed that the students have a basic knowledge of DNA (structure and replication), transcription and protein synthesis	
Objective:	This course develops concepts in molecular biology: DNA packaging, DNA damage and repair, gene structure, expression and regulation in both prokaryotes and eukaryotes	
Content:		**(30)**
1.	Isolation of genomic DNA of eukaryotic microorganisms, estimation of quantity and purity of DNA by spectrophotometry, and agarose gel electrophoresis.	
2.	Recovery of genomic DNA from agarose gel.	
3.	Extraction of mRNA / total RNA.	
4.	cDNA synthesis from mRNA.	
5.	PCR amplification of a specific gene using genomic DNA as a template and agarose gel analysis of PCR product to determine amplicon size.	
Pedagogy:	Hands-on experiments in the laboratory, video, online data	
References/ Readings	Alberts, B., Heald, R., Johnson, A., Morgan, D., Raff, M., Roberts, K., Peter Walter, P., Molecular Biology of the Cell. WW Norton & Co. (2022).	
	Darnell, J. E., Lodish, H. F. and Baltimore, D., Molecular Cell Biology, Scientific American Books, Spektrum Akademischer Verlag. (1990)	
	Davis, L. G., Dibner, M. D. and Battey, J. F., Basic Methods in Molecular Biology, Elsevier (1986).	
	Gardner, E. J., Simmons, M. J. and Snustad, D. P. Principles of Genetics, John Wiley & Sons (2006).	
	Gerhardt, P., Methods for General and Molecular Bacteriology, Elsevier (1994).	
	Green, M. R. and Sambrook, J., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, New York (2014).	
	Krebs, J.E., Krebs J.E., Lewin B., Goldstein E.S. and Kilpatrick, S.T., LEWIS Genes XII, Jones and Bartlett Publishers (2018)	
	Malacinski, G.M., Freifelder's Essentials of Molecular Biology, Narosa Book Distributors Private Limited (2008).	
	Tamarin, R. H., Principles of Genetics, McGraw-Hill Higher Education (2017).	
	Twyman, R. M. and Wisden, W., Advanced Molecular Biology: A Concise Reference, Garland Science (1998).	
	Watson, J. D., Molecular Biology of the Gene, Pearson/Benjamin Cummings (2007).	
Course Outcomes	◆ Isolate genomic DNA and mRNA of eukaryotes. ◆ Construct cDNA. ◆ Compare gene and its expression. ◆ Evaluate amplified DNA product.	