FACULTY OF SCIENCE
B.Sc. (Biotechnology) Semester-4
In Effect from Academic Year 2022-23

Subject Code: 2SC1010401	Subject Title: Central Dogma of Life
Course Type: Core Course	

Course Objective: This course provides advance knowledge of Molecular Biology of prokaryotes and eukaryotes. It will allow to students to grasp the central dogma and expression & regulation of gene.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
3	-	3	-	3	70	30	-	-	100

A. Biotechnology Theory:

Unit	Content	Lectures	Weight (%)
1	**Topology DNA, DNA replication.** • Genomic organization of prokaryotic and eukaryotic cells. • Experimental evidences:DNA as genetic material, Semiconservative nature of DNA replication • Concept of central dogma. • Definition: DNA supercoiling, Linking number, role of topoisomerase and its catalytic mechanism • Replication of DNA:Replication in bacteria, Enzymes/ Proteins involved in replication,Eukaryotic replication, ends of linear DNA by telomerase	16	35%
2	**Process of transcription and translation** • Transcription: Prokaryotic transcription, Eukaryotic transcription, Post transcriptional modification • Genetic code • Translation: Charging of tRNA, Prokaryotic translation, Eukaryotic translation, Post translationalmodification	17	35%
3	**Regulation of gene expression & DNA damage and repair** • Regulation of gene expression in prokaryotes: lac operon, trp operon and Immunity operon of bacteriophage Lamda. • Gene regulation in eukaryotes: DNA binding proteins (Activators), yeast galactose utilizing Genes, RNA interference • Causes and types of DNA damage • DNA repair mechanisms	12	30%

Learning Outcome: After studying this paper one should know concept of central dogma of life, mechanisms of replication, transcription, translation and basics of gene regulations.

Reference book:

- Lewin B.(2000) Gene VIL IRL Press, Oxford University Press Oxford.
- Watson, J.D., Hopkins, Roberts, Stiez, Weiner. (1987) Molecular Biology of the Gene. (4th Ed) The Benjamin/Cummings Publishing Co. Inc. California.
- T.A. Brown, Genome.
- S.B. Primrose Principle of gene manipulation.
- Molecular Biology of the Gene (VI Edition.). Cold Spring Harbour Lab. Press, Pearson Pub.
- Nelson, D.L., Cox, M.M. (2004) Lehninger Principles of Biochemistry, 4th Edition, WH Freeman and Company, New York, USA.