

Subject Code: 2SC1000421	Subject Title: DNA Damage, Repair and Homologous Recombination
Course Type: Subjective Elective	

Course objective: This course is designed to provide the knowledge of the causes of DNA damage, and effects and repair mechanism to maintain the integrity of the treasure of life “DNA”.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
2	--	2	--	2	35	15	--	--	50

A. Subjective Elective Theory:

Unit	Content	Lectures	Weight (%)
1	✓ Chromosomal Alterations ✓ Types of Mutations ✓ DNA damage and repair: causes and types of DNA damage: DNA repair mechanisms: Mismatch DNA repair, nucleotide excision repair, base excision repair, direct DNA repair, SOS response, Photo reactivation, translesion synthesis, recombinational repair, nonhomologous end joining.	15	50
2	✓ Recombination: Homologous DNA recombination-Holiday models, molecular events. Site specific DNA recombination-molecular events. ✓ Transposable elements: Structure: Insertion Sequences, Composite Transposons and Non composite transposons, mechanism of transposition, Transposition – replicative and non replicative mechanisms.	15	50

Learning Outcome: Understanding the DNA damage and repair mechanism will enable the students to exploit it for research and commercial applications.

Reference book:

- Molecular Biology of Cell: B. Alberts et. al.
- Molecular Biology of the Gene J. D. Watson et. Al.
- Genes X B. Lewin
- Instant notes on Molecular Biology Turner
- Principles of Genetics Snustard
- Fundamental Bacterial Genetics Nancy Trun & Janie Trempy
- Principles of Microbiology ,R.M. Atlas.
- Molecular genetics of bacteria, Synder and Champness.
- Nelson, D.L., Cox, M.M. (2004) Lehninger Principles of Biochemistry, 4th Edition