BSBT 303: Metabolism and Genetic Engineering

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSBT 303	DC	Metabolism and Genetic Engineering	60	20	20	30	20	4	1	2	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P Practical; C - Credit;

***Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.**

Course Objectives:

1. To understand the biochemistry of primary and secondary metabolism
2. To understand the principles of genetic engineering

Course Outcomes:

1. Student will have the knowledge of synthesis and degradation of biomolecules
2. Students will be able to understand the application part of molecular biology

Unit –I

Carbohydrate metabolism aerobic and anaerobic glycolysis. Gluconeogenesis. Pentose phosphate pathway.

Lipid metabolism synthesis and degradation of fatty acids.

Unit – II

Nitrogen metabolism: Biological nitrogen fixation, Nitrate reduction and its regulation, Ammonia assimilation.

Biosynthesis of amino acids. Oxidation of amino acids and production of urea.

Unit III

Protein synthesis. Protein targeting and degradation.

Biosynthesis and degradation of nucleotides.

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Unit-IV

Techniques in genetic engineering. Vector mediated gene transfer. Gene cloning and cloning techniques. Identification of clones.

Unit – V

Production and applications of transgenic plants, animals and microbes.
Genetic engineering and human diseases.
Biosafety guidelines and ethical issues of genetic engineering.

BSBTL306 Practical:

1. Extraction and estimation of carbohydrates
2. Extraction and estimation of lipids
3. Extraction and estimation of proteins
4. Gel electrophoresis of proteins
5. Extraction of DNA from plant cells
6. Extraction of DNA from animal cells
7. Genomic DNA isolation from microorganisms
8. Spectrophotometric analysis of DNA
9. Analysis of DNA by Agarose gel electrophoresis
10. Extraction of RNA from plant cells
11. Extraction of RNA from animal cells
12. Extraction of RNA from microorganisms

Books:

1. Gene IX – Lewin B. Jones and Barlett Publishers
2. Molecular Biology of the gene, Watson et al, Benjamin Cummings Publishing Company Inc.
3. Molecular Biology of the cell, Garland.
4. Molecular Biotechnology, Glick BR and Pasternak JJ, ASM Press
5. Molecular Cell Biology, Lodish et al.
6. Gene Cloning, Brown TA.

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