

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
INSTRUCTION DIVISION
First semester 2015-2016

Date: 03/08/2015

COURSE HANDOUT (PART-II)

In addition to part-I (General Handout for all courses) printed on page 1 of the timetable book, this portion gives further specific details regarding the course.

Course no. : BIO C211/BIO F211
Course title : Biological Chemistry
Instructor in charge : Rajesh Mehrotra

1. Course description: This course is intended to offer an introduction to the world of Biochemistry. The course deals with the structure, properties, and significance of the major groups of biochemical compounds (amino acids, proteins, carbohydrates, nucleic acids, and lipids), the bioenergetic principles, enzyme mechanisms and regulation of the central metabolic pathways. Efforts will be made to include the recent advances and methodologies related to biochemistry. This would help students going for higher level activities, appreciation of biochemical problems, evaluation and problem solving.

2. Text Book (T): Mary K. Campbell and Shawn O. Farrell, Biochemistry, 7th edition, International edition, copyright 2012 (Thompson Brooks/Cole, Cengage Learning).

3. Reference Books (R)

- a. D. Nelson & M Cox., Lehninger, Principles of Biochemistry, Palgrave, 4th Ed.
- b. Donald Voet et al., Biochemistry, Wiley, 1993
- c. Lubert Stryer et al., Biochemistry, W H Freeman and company, 2007

4. Course plan:

Lec. No.	Learning objective	Topics to be covered	Reference/Chapter/sec#/book
1-2	Biochemistry and organization of cells	Chemical nature of Biomolecules-, organization of Prokaryotes and Eukaryotes, how cells use energy	T1
3-8	Amino acids, Peptides and Proteins	Amino acids and peptides, three dimensional structure of proteins, protein purification and characterization techniques	T3, T4, T5
9-12	Enzymes	Classification, Enzymes Kinetics and mechanism of action Inhibitors and regulators Allosteric enzyme, Isoenzymes	T6, T7
13-16	Lipids and Membranes	Chemical nature of lipids and their biological functions, structure and function of biological membranes, working with lipids	T8
17-18	Bioenergetics	Bioenergetics and thermodynamics, chemical	RF (a) 13

	and Biochemical reaction types	logic and common biochemical reactions, phosphoryl groups transfer and ATP, biological oxidation-reduction reactions	
19-27	Carbohydrates and carbohydrate metabolism	Glycolysis, Reversal of Glycolytic sequence Utilization of carbohydrates, Regulation of glycolysis, Pentose phosphate pathway, Citric acid cycle, Glyoxylic acid cycle	T16, T17, T18, T19,
28-30	Biological oxidations	Components involved in ETC, Respiratory chain, Oxidative phosphorylations and its mechanisms	T20
31-32	Lipid metabolism	Hydrolysis and transport of fats, β -oxidation Oxidation of unsaturated fatty acids, Formation of Ketone bodies, Biosynthesis of fatty acids.	T21
33-34	Nucleotides and Nucleic acids	Nucleic acid structure, Nucleic acid chemistry, other functions of nucleotides	RF (a) 8, T9
35-36	Photosynthesis	Introduction, Path of carbon-calvin cycle, C4 pathway	T22
37-39	Metabolism of nitrogen	Catabolism of amino acids, Assimilation of ammonia, Urea cycle and formation of uric acid, Purine Biosynthesis, Pyrimidine Biosynthesis, Salvage pathway.	T23

5. Evaluation Scheme:

EC No	Evaluation component	Duration	Weightage	Date	Remarks
1	Midterm Test	90 min	30	5/10 8:00 - 9:30 AM	CB
2	Quizzes (surprise) and /or /Group discussion/Assignments		30	Will be announced in class	CB and/or OB
3	Comprehensive examination	3 h	40	1/12 FN	CB and OB

6. Chamber consultation hours: Will be announced in class

7. Notices: Would be displayed on the biology department notice board.

8. Quizzes: These evaluation components will be conducted during lecture as well as tutorial hours.

9. Make up Policy: Make up will be given only for genuine cases. No make up for quizzes.

Instructor - In charge
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