02/08/2018

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 F211**
Course Title	**:**	**BIOLOGICAL CHEMISTRY**
Instructor-in-Charge	**:**	**Meghana Tare**
Office	**:**	**3277-J, New Science Block, FD-III**
Telephone Extn	**:**	**X5635**
Email	**:**	**meghana.tare@pilani.bits-pilani.ac.in**
Office Hours	**:**	**By Appointment (Over email)**

1. Course description: This course is intended to offer an introduction to the world of Biological Chemistry. Thecourse deals with the structure, properties, and significance of the major groups of biochemical compounds(amino acids, proteins, carbohydrates, nucleic acids, and lipids), the bioenergetics, enzymemechanisms and regulation of the central metabolic pathways. Efforts will be made to include the recentadvances and methodologies related to biochemistry. This would help students going for higher levelactivities, appreciation of biochemical problems, evaluation and problem solving.

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

3. Reference Books (RB)

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(s)	Topics	RB/TB Chapters
1-3	Biochemistry and organization of cells	Chemical nature of Biomolecules, organization of Prokaryotes and Eukaryotes, how cells use energy.	T1
4-7	Carbohydrates	Structure and stereochemistry, reactions, some important oligosaccharides and polysaccharides and their biological roles	T16
8-10	Nucleic acids	Nucleic acid structure, Nucleic acid chemistry, other functions of nucleotides.	RF (a) 8, T9
11-13	Lipids and Membranes	Lipids and proteins are associated in membranes, membrane structure	T8
14-17	Amino acids, Peptides and Proteins	Amino acids and peptides, three dimensional structure of proteins, protein purification and characterization techniques	T3, T4, T5
18-20	Enzymes	Classification, Enzymes Kinetics and mechanism of action, Inhibitors and regulators, Allosteric enzymes, Isoenzymes	T6,T7
21-22	Bioenergetics and Biochemical reaction types	Bioenergetics and thermodynamics, chemical logic and common biochemical reactions, phosphoryl groups transfer and ATP, biological oxidation-reduction reactions	RF (a) 13
23-28	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,
29-30	Biological oxidations	Components involved in ETC, Respiratory chain, Oxidative phosphorylation and its mechanisms	T20
31-33	Lipid metabolism	Hydrolysis and transport of fats, β-oxidation, Oxidation of unsaturated fatty acids, Formation of Ketone bodies, Biosynthesis of fatty acids.	T21
34-35	Photosynthesis	Introduction, Path of carbon-Calvin cycle, C4 pathway	T22
36-38	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

Component	Weight	Date and Time	Venue (Rm. #)	Remarks
Mid Sem	30%	13/10 2:00 - 3:30 PM	TBD	Closed Book
Quizzes and Assignments	30%	TBA	Classroom/Tutorial hours	Surprise/ Some pre announced
Comprehensive Examination	40%	12/12 FN	TBD	Partly open-book type

6. Grading Policy:

Award of grades would be guided by the histogram of marks. Decision for cases on borderline of two grades will be based on the student's promptness and participation in classroom activities as well as satisfactory attendance in lecture and tutorial classes. If a student misses even a single component entirely or does not give sufficient opportunity for being assessed, he/she may be awarded 'NC' report regardless of his/her final total score in the course (see Clause 4.19 of *BITS Academic Regulations*).

7. Make-up Policy:

For a foreseen absence, make-up request should be made *in person* to the Instructor-in-Charge, well before the scheduled evaluation component. Reasons for unanticipated absence that qualify a student to apply for make-up include medical or similar personal emergencies only; in such an event, the student should contact the Instructor-in-Charge as soon as practically possible. Make-ups for journal club presentations and quizzes/assignments are not usually given. For regulations about the make-up flexibility, students are advised to refer to Clause 4.07 of *BITS Academic Regulations*

8. Course Announcements and Notices:

Announcements pertaining to the course will be made in the lecture/tutorial class. In some cases, printed notices shall be displayed in the notice board of only the Department of Biological Sciences.