BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI, HYDERABAD CAMPUS
FIRST SEMESTER 2022-2023
Course Handout (Part-II)

Date : 29/08/2022

In addition to part I (General Handout for all courses appended to the time table this portion gives further specific details regarding the course.

Course No. **: BIO F211**
Course Title **: BIOLOGICAL CHEMISTRY**
Instructor-in-Charge **: Ramakrishna Vadrevu**
Instructor(s) **: Debashree Bandyopadhyay, (L), I Shivkumar Sharma (T)**

1.Course Description & Objective: Biochemistry is an introductory course to explain basic biochemical and structural features of different bio-macromolecules. This describes cellular and molecular processes and biochemical pathways emphasizing the energetics within living systems. Biochemistry course will help the students to relate the biochemical processes with clinical insights.

2.Text Book (T):
Campbell, Marry K and Farell, Biochemistry, Thomson Learning ,5th Edition, Copyright 2006

3.Reference Books
R1. Biochemistry. Berg, Tymoczko, Gatto & Stryer. 6th Edition, 2007
R2. Nelson and Cox. Principles of Biochemistry (Lehninger), 5th Edition. W.H. Freeman Publishers.
R3. Donald Voet et. al., Biochemistry, Wiley, 1993.

4 Course Plan:

Lec. No.	Topics to be covered	Learning Objective	Chapter in the Text Book
1	Cellular Organization	1. Cellular organization, Spontaneity in biochemical reactions	T1,
2-13		1. Amino Acids, Protein- structure & function, protein folding & conformation, 2. Protein purification and characterization 3. Lipids 4. Nucleic acids 5. Carbohydrates	T3, T4, T5, T8, T9, T10, T16 Class Notes
14-18	Enzymes	1. Classification 2. Enzyme kinetics and Mechanism of action 3. Enzyme inhibitors and regulators 4. Allosteric enzymes 5. Isoenzymes 6. Vitamins and coenzymes	T6, T7
19-20	Biochemical Energetics	1. Concept of Free Energy 2. Energy Rich Compounds 3. Coupling Reactions 4. Oxidation-Reduction	R2(13), T15, Lecture Notes
21-28	Carbohydrate Metabolism	1. Glycolysis 2. Gluconeogenesis 3. 4. Regulation of Glycolysis 5. TCA cycle 6. Glyoxylic acid cycle 7. Glycogen breakdown	T17, T18, T19,

29-31	Biological Oxidations	1. Components involved in ETC 2. Respiratory chain 3. Oxidative phosphorylation and its mechanisms.	T20
32-35	Lipid Metabolism	1. Hydrolysis and transport of fats 2. β -Oxidation 3. Oxidation of Unsaturated Fatty acids 4. Formation of Ketone bodies 5. Biosynthesis of Fatty acids	T21
36-38	Amino acid and protein metabolism	1. Catabolism of Amino acids 2. Assimilation of Ammonia 3. Urea cycle and formation of Uric acid	T23
39-40	Nucleic acid metabolism	1. Purine biosynthesis 2. Pyrimidine biosynthesis 3. Salvage pathway	T23

5.Evaluation Scheme:

Evaluation Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid semester Exam	90 min	30	31/10 9.00 - 10.30AM	Closed Book
Assignments/Quizzes. (continuous evaluation/Announced in the class). Assignments can be in-class or take home)		30	Continuous Evaluation	Open Book (10%) (20M) Closed Book 20% (40 M)
Comprehensive Exam	180 min	40	17/12 FN	Open Book 20%, Closed Book 20%

6.Chamber Consultation Hour: Will be announced in the Class.

7.Notices: All notices, concerning the course will be displayed on CMS. Announcements for assignments/quizzes can be made in the class.

8.Make-up Policy: Prior permission of the instructor-in-Charge is necessary for any make-up. No make-ups for continuous evaluation will be granted. May be considered for medical/hospitalization situations.

9. Grading: Award of grades will 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*).

10. Academic Honesty and Integrity Policy:

Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.