



Isfahan University of Medical Sciences

Course Plan

Course Title: **Biochemistry of Discipline**

Degree: MBBS	Course Code: 3114039
Academic Year: 2022-23 (Term 1)(1401-02_1)	Classroom Location: Shahid Soleimani Bldg.
Course credit: 1.3 unit	Days & hours of Class Time: Monday 10-12a.m.
Starting Date: Mon 12 th September 2022	Lecturer: Professor Pourfarzam (Office Phone: 7045)
Email: pourfarzam@pharm.mui.ac.ir	Office Address: Dept of Clinical Biochem, School of Pharmacy, IUMS

The General Purpose of the Course:

Metabolism represents the sum of the chemical changes that convert nutrients, the “raw materials” necessary to nourish living organisms, into energy and the chemically complex finished products of cells. Metabolism consists of literally thousands of enzymatic reactions organized into discrete but interconnected pathways. These pathways proceed in a stepwise fashion, transforming substrates into end products through many specific chemical intermediates. Metabolism is sometimes referred to as intermediary metabolism to reflect this aspect of the process. Although metabolism embraces many hundreds of different enzyme catalyzed reactions, our major concern in this course is the central metabolic pathways, which are few in number and remarkably similar in all forms of life.

The course aims to provide an advanced understanding of the concept of Biochemistry regarding the metabolism (anabolism & catabolism) of biomolecules such as carbohydrates, proteins, amino acids, lipids, nucleic acids, enzymes, vitamins and cofactors. You’ll learn about the principles governing the control of metabolism and learn how these interconnects with human disease and clinical care.

References:

Harper’s Illustrated Biochemistry. 31st ed. (2018)
Lehninger Principles of Biochemistry, 7th ed. (2017)
Lippincott Illustrated Reviews: Biochemistry, 7th Edition (2017)

Course Plan- Biochemistry of Discipline_2022-23_1

Session	Topic	Reading Source	
		Harper	Lehninger
1	Course Introduction; Bioenergetics: Energy Producing and Energy Utilizing Systems, Thermodynamic Relationships and Energy Rich Components, The Role of ATP	Chap 11	Chap 13
2	Biologic Oxidation; Structure and Compartmentation by Mitochondrial Membranes, The Respiratory Chain & Oxidative Phosphorylation;	Chap 12	Chap 19
3	The Citric Acid Cycle	Chap 16	Chap 16
4	Carbohydrate Metabolism (Part I): Glycolysis, The Pentose Phosphate Pathway & Other Pathways of Hexose Metabolism & the Oxidation of Pyruvate	Chap 17	Chap 14
5	Carbohydrate Metabolism (Part II): Metabolism of Glycogen; Clinical Correlations	Chaps 18 & 19	Chap 14
6	Carbohydrate Metabolism (Part III): Gluconeogenesis & the Control of Blood Glucose	Chap 20	Chap 14
Midterm Exam			
7	Amino Acid Metabolism (part I); Catabolism of Proteins & of Amino Acid Nitrogen; Urea Cycle; Catabolism of the Carbon Skeletons of Amino Acids, Clinical Correlations	Chaps 28 & 29	Chap 18
8	Amino Acid Metabolism (part II); Biosynthesis of the Nutritionally Nonessential Amino Acids; Conversion of Amino Acids to Specialized Products, Clinical Correlations	Chaps 27 & 30	Chap 22
9	Lipid Metabolism (Part I): Digestion, Mobilization, and Transport of Fats, Oxidation of Fatty Acids & Ketogenesis, Biosynthesis of Fatty Acids & Eicosanoids	Chaps 22 & 23	Chap 17
10	Lipid Metabolism (Part II): Cholesterol Synthesis, Regulation, Transport, & Excretion. Bile Acids Metabolism, Transport, & Excretion. Cholesterol & Lipoprotein Metabolism, Clinical Correlations	Chaps 25 & 26	Chap 21
11	Metabolism of Purine & Pyrimidine Nucleotides: Metabolic Functions of Nucleotides, Chemistry of Nucleotides, Metabolism of Purine Nucleotides, Metabolism of Pyrimidine Nucleotides, Clinical Correlations	Chap 33	Chap 22
12	Porphyryns & Bile Pigments: Heme Biosynthesis, Heme Catabolism, Clinical Correlations	Chap 31	
13	Integration of Metabolism & Metabolic Interrelationships: Starve–Feed Cycle, Mechanisms Involved in Switching the Metabolism of Liver between the Well-Fed State and the Starved State, Metabolic Interrelationships of Tissues in Various Nutritional and Hormonal States	Chap 14	Devlin 21
Final Exam			

Evaluation and Exams		
Midterm	40%	Exam Date is scheduled at the first session
Final Exam	60%	Exam Date is scheduled by the University
	Up to %20	Classroom & active learning activities

INFORMATION AND POLICIES

1. The Department of Biochemistry upholds and enforces the University's policies on, plagiarism and cheating. These policies are available from International students office. All students are advised to read these policies.
2. Absences will be treated according to the university's vice-chancellor for education policies.
3. Late arrival more than 5minutes is considered absence.
4. Mobile phones, Tablets, and other electronic devices must be turned off at all times unless being used for a purpose relevant to the class. Students having a Mobile phone, tablet, or computer on their person during an exam will be assumed to have it for the purpose of cheating.
5. Any recordings of lectures may only be performed with written permission of the lecturer, and are for personal use only. The instructor retains copyright to such recordings and all lecture materials provided for the class (electronic and otherwise); these materials must not be shared or reposted on the Internet.
6. Course materials, such as notes, problem sheets, examinations, example sheets, or review sheets, may not be redistributed without the explicit written permission of the instructor.