Isfahan University of Medical Sciences

Course Plan

Course Title: Biochemistry of Discipline

Degree: MBBS & MD	**Course Code:** 3114039
Academic Year: 2026-27 (Term 1)(1405-06_1)	**Classroom Location:** Shahid Soleimani Bldg.
Course credit: 1.3 unit	**Days & hours of Class Time:** Monday 10-12a.m.
Starting Date: October 2026	**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)

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Session	Topic	Reading Source Chapter No.		
		Harper	Lippincott	Lehninger
1	Course Introduction; Bioenergetics: Energy Producing and Energy Utilizing Systems, Thermodynamic Relationships and Energy Rich Components, The Role of ATP	11	6	13
2	Biologic Oxidation	12		13
3	The Respiratory Chain & Oxidative Phosphorylation	13	6	19
4	The Citric Acid Cycle	16	9	16
5	Carbohydrate Metabolism (Part I): Glycolysis, The Pentose Phosphate Pathway & Other Pathways of Hexose Metabolism & the Oxidation of Pyruvate	17	10, 12 & 13	14
6	Carbohydrate Metabolism (Part II): Metabolism of Glycogen; Clinical Correlations	18 & 19	11	14
7	Carbohydrate Metabolism (Part III): Gluconeogenesis & the Control of Blood Glucose	20	10	14
	Midterm Exam			
8	Amino Acid Metabolism (part I); Catabolism of Proteins & of Amino Acid Nitrogen; Urea Cycle; Catabolism of the Carbon Skeletons of Amino Acids, Clinical Correlations	28 & 29	19	8
9	Amino Acid Metabolism (part II); Biosynthesis of the Nutritionally Nonessential Amino Acids; Conversion of Amino Acids to Specialized Products, Clinical Correlations	27 & 30	20	22
10	Lipid Metabolism (Part I): Digestion, Mobilization, and Transport of Fats, Oxidation of Fatty Acids & Ketogenesis, Biosynthesis of Fatty Acids & Eicosanoids	22 & 23	15 & 16	17
11	Lipid Metabolism (Part II): Cholesterol Synthesis, Regulation, Transport, & Excretion. Bile Acids Metabolism, Transport, & Excretion. Cholesterol & Lipoprotein Metabolism, Clinical Correlations	25 & 26	18	21
12	Metabolism of Purine & Pyrimidine Nucleotides: Metabolic Functions of Nucleotides, Chemistry of Nucleotides, Metabolism of Purine Nucleotides, Metabolism of Pyrimidine Nucleotides, Clinical Correlations	33	22	22
13	Porphyrins & Bile Pigments: Heme Biosynthesis, Heme Catabolism, Clinical Correlations	31	21	
14	Integration of Metabolism & Metabolic Interrelationships: Starve–Feed Cycle, Mechanisms Involved in Switching the Metabolism of Liver between the WellFed State and the Starved State, Metabolic Interrelationships of Tissues in Various Nutritional and Hormonal States	14	23 & 24	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 5 minutes 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.