



UNIVERSITI TEKNOLOGI MARA

PHC429: PHARMACEUTICAL BIOCHEMISTRY

Course Name (English)	PHARMACEUTICAL BIOCHEMISTRY APPROVED
Course Code	PHC429
MQF Credit	2
Course Description	This course provides an introduction to the biochemistry, cellular biochemistry and its application in pharmaceutical field. The structure and metabolism of carbohydrates, amino acids and proteins, lipids, and nucleic acids is explained in details. The chemistry of enzymes, its nomenclature and properties are discussed. The understanding of biomolecules' metabolism integration and its relationship with hormones and vitamins is also taught in this course.
Transferable Skills	Team work, oral communication, presentation skills, problem solving skills, time management
Teaching Methodologies	Lectures, Practical Classes, Problem Based Learning (PBL), Self-directed Learning
CLO	CLO1 Describe the biochemistry of enzymes and metabolism of four essential biological compounds namely carbohydrates, lipids, protein, and nucleic acids. CLO2 Explain the concepts of metabolism in various conditions of the body, its relation with hormones and vitamins as well as its clinical biochemistry correlation. CLO3 Measure enzyme activity and detect biomolecules using the appropriate tools in the laboratory.
Pre-Requisite Courses	No course recommendations
Topics	
1. Carbohydrates I	1.1) Classification, structure and chemical characteristics.
2. Carbohydrates II	2.1) Metabolism, tricarboxylic acid cycle, uronic acid pathway, electron transport chain.
3. Practical 1	3.1) Carbohydrates
4. Amino Acids & Protein I	4.1) Classification, characteristics, chemical properties, protein structure, bonding, allosterism.
5. Amino Acids & Protein II	5.1) Metabolism: essential amino acid, transamination, oxidative deamination, decarboxylation, ketogenic and glucogenic amino acids, urea cycle.
6. Practical 2	6.1) Glucose Tolerance Test
7. Lipids I	7.1) Classification, structure, chemical characteristics, digestion & transportation.
8. Lipids II	8.1) Metabolism, fatty acid oxidation, ketogenesis, lipogenesis and cholesterol biosynthesis.
9. Practical 3	9.1) Amino acids & Lipid
10. Enzymes	10.1) Classification, naming, basic properties, substrate specificity, enzyme activation unit, Michaelis-Menten equation, effects of pH and temperature on enzyme reactivity, enzyme denaturation, isozymes.

11. Hormones and Vitamins 11.1) Names, classifications, functions and deficiencies, role of vitamins: coenzymes and folate pathways
12. Practical 4 12.1) Enzyme
13. Integration of Metabolism 13.1) Interrelationship between metabolism of carbohydrates, lipids and proteins, disorders of abnormal metabolism.
14. Nucleic Acids I 14.1) Purine and pyrimidine, nucleoside, nucleotide, DNA and RNA, structure and function.
15. Problem based learning I 15.1) Discussions and presentation outlines
16. Nucleic Acids II 16.1) Transcription, translation, mutagenesis, metabolism of purine & pyrimidine nucleotides
17. Problem based learning II 17.1) Presentation
18. Clinical Correlations in Biochemistry I 18.1) Common value in normal physiology in biochemistry test
19. Clinical Correlations in Biochemistry II 19.1) Common value in normal physiology in biochemistry test

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Practical	Practical reports	20%	CLO3
	Presentation	Problem-based Learning	20%	CLO2

Reading List	Recommended Text	<ul style="list-style-type: none"> Mary K. Campbell, Shawn O. Farrell, Owen M. McDougal 2018, <i>Biochemistry</i>, Cengage Learning [ISBN: 9781305961135]
	Reference Book Resources	<ul style="list-style-type: none"> Denise R. Ferrier 2017, <i>Lippincott Illustrated Reviews: Biochemistry</i>, 7 Ed., Lippincott William & Wilkins Publication [ISBN: 978-149634449] Gerhad Meisenberg & William H. Simmons 2016, <i>Principles of Medical Biochemistry</i>, 4 Ed., Mosby Elsevier [ISBN: 978-032329616]

Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources