UNIVERSITI TEKNOLOGI MARA

PHC462: PHARMACEUTICAL BIOCHEMISTRY

Course Name (English)	PHARMACEUTICAL BIOCHEMISTRY APPROVED
Course Code	PHC462
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. Lipids I 6.1) Classification, structure, chemical characteristics, digestion & transportation.
7. Practical 2 7.1) Glucose Tolerance Test
8. Lipids II 8.1) Metabolism, fatty acid oxidation, ketogenesis, lipogenesis and cholesterol biosynthesis.
9. Test 1 9.1) N/A
10. Practical 3 10.1) Amino Acids and Lipids

11. Enzymes 11.1) Classification, naming, basic properties, substrate specificity, enzyme activation unit, Michaelis-Menten equation, effects of pH and temperature on enzyme reactivity, enzyme denaturation, isozymes.
12. Hormones and Vitamins 12.1) Names, classifications, functions and deficiencies, Role of vitamins: coenzymes and folate pathways
13. Practical 4 13.1) Enzymes
14. Integration of Metabolism 14.1) Interrelationship between metabolism of carbohydrates, lipids and proteins, disorders of abnormal metabolism.
15. Nucleic Acids I 15.1) Purine and pyrimidine, nucleoside, nucleotide, DNA and RNA, structure and function.
16. Problem based learning I 16.1) Discussions and presentation outlines
17. Nucleic Acids II 17.1) Transcription, translation, mutagenesis, metabolism of purine & pyrimidine nucleotides
18. Problem based learning II 18.1) Presentation
19. Clinical Correlations in Biochemistry I 19.1) Common value in normal physiology in biochemistry test
20. Clinical Correlations in Biochemistry II 20.1) Common value in normal physiology in biochemistry test
21. Final assessment 21.1) N/A

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**	• **Mary K. Campbell,Shawn O. Farrell,Owen M. McDougal 2018, *Biochemistry*, 9th Ed., Cengage Learning [ISBN: 9781305961135]**
	Reference Book Resources	• **Denise R. Ferrier 2017, *Lippincott Illustrated Reviews: Biochemistry*, 7 Ed., Lippincott William & Wilkins Publication [ISBN: 978149634449]** • **Gerhad Meisenberg and William H. Simmons 2016, *Principles of Medical Biochemistry*, 4th Ed., 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	