Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E

Study Plan No.	**2021/2022**		**University Specialization**		**Bachelor of Pharmacy**	
Course No.	**0201380**		**Course Name**		**Clinical Biochemistry and Clinical Nutrition**	
Credit Hours	**3**		**Prerequisite *Co-requisite**		**Biochemistry + Pathophysiology**	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☐ Faculty Mandatory Requirement	☐ Support course family requirements	☑ **Mandatory Requirement**	☐ Elective Requirement
Teaching Style	☐ Full Online Learning		☑ **Blended Learning**		☐ Traditional Learning	
Teaching Model	☐ 1 Synchronous: 1 Asynchronous		☑ **1 Face to Face: 1 Asynchronous**		☐ 2 Traditional	

Faculty Member and Study Divisions Information *(to be filled in each semester by the subject instructor)*

Name	Academic rank	Office No.	Phone No.	E-mail	
Office Hours (Days/Time)	**Sunday, Tuesday, Thursday ()**		**Monday, Wednesday ()**		
Division number	**Time**	**Place**	**Number of Students**	**Teaching Style**	**Approved Model**
				Blended Learning	**1 Face to Face: 1 Asynchronous**

Brief Description

This course provides an overview of the key aspects of clinical biochemistry “a branch of laboratory medicine in which biochemical methods are used for the study of diseases. This course provides knowledge for the pharmacy students about the principles of the biochemical analysis of clinical samples and how biochemical investigations can be employed in the diagnosis, monitoring and management of diseases. Case studies are used to highlight and explain the biochemical disorders underlying clinical diseases. This course also provides an overview of the importance of appropriate nutrition support; enteral nutrition, parenteral nutrition and relating the biochemical indices with patient's nutritional status.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	1. Clinical Biochemistry: An Illustrated Colour Text, 5e by Allan Gaw MD PhD FRCPath FFPM PGCertMedEd, Michael J. Murphy FRCP Edin FRCPath, Rajeev Srivastava and Robert A. Cowan BSc PhD (Jul 16, 2013) 2. Krause's Food & the Nutrition Care Process, MEA edition by L. Kathleen Mahan Janice Raymond , 8th December 2016, Elsevier.
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Marks' Basic Medical Biochemistry (Lieberman, Marks's Basic Medical Biochemistry) by Alisa Peet MD, Michael A. Lieberman PhD and Allan Marks MD (Mar 29, 2012) 2. Harper's Illustrated Biochemistry, 29e Robert K. Murray, David A Bender, Kathleen M. Botham, Peter J. Kennelly, Victor W. Rodwell, P. Anthony Weil. Copyright © 2012 by The McGraw-Hill Companies, Inc

Supporting Websites	American Society for Parenteral and Enteral Nutrition: http://www.nutritioncare.org/ European Society for Parenteral and Enteral Nutrition: http://www.espen.org Infusion nurses Society: http://www.ins1.org			
The Physical Environment for Teaching	☑ **Class room**	☐ **Labs**	☑ **Virtual Educationa l Platform**	☐ **Others**
Necessary Equipment and Software	- **Moodle.**			
Supporting People with Special Needs				
For Technical Support	**E-learning &Open Educational Resources Center** **E-mail: elearning@zuj.edu.jo Phone: +962 6 4291511 ext. 425/362.**			

Course learning outcomes *(K= Knowledge, S= Skills, C= Competencies)*

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge **The student should be able to:**		
K1	Describe the normal water and electrolytes balance in human body and relate the effect of diseases on this balance.	**MK3**
K2	Interpret blood gas analysis results for identification and management of acid–base disorders.	**MK3**
K3	Explain RFTs (renal function tests), LFTs (liver function tests), hormonal assay tests and asses the cardiac and bone biomarkers, which are analyzed in biochemistry lab.	**MK3**
K4	Explain carbohydrates and lipids metabolism disorders and asses their biomarkers, which are analyzed in the biochemistry lab.	**MK3**
K5	Identify criteria for appropriate nutrition support, enteral nutrition, parenteral nutrition, indications for uses and contraindication.	**MK3**
Skills **The student should be able to:**		
S1	Correlate the changes in biochemical investigations to the molecular basis of diseases.	**MS2**
S2	Communicate effectively with the medical team concerning the use of laboratory tests in the diagnosis of diseases.	**MS3**
S3	Communicate professionally with the patients concerning the importance of appropriate nutritional support in healthcare aspects.	**MS3**
Competencies **The student should be able to:**		
C1	Assess symptoms and diagnostic tests and correlate with associated disease.	**MC1**
C2	Interpret patient biochemical laboratory findings preformed in clinical practice.	**MC1**
C3	Advise patients and other health care professionals	**MC2**

Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	30%	30%	0%
Participation / Practical Applications	0%	0%	20%	50%
Asynchronous Interactive Activities	20%	20%	0%	0%
Final Exam	50%	50%	50%	50%

Note 1: *Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.*

Note 2: *According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).*

Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	Introducing clinical biochemistry repertoire and specimen collection Fluid and electrolyte balance	Traditional	Clinical Biochemistry: An Illustrated Colour Text - Chapter 1: Section 1,2,3,4 Chapter 2 Section: 5,6,7
2	Hyponatraemia and hypernatraemia: Assessment and management.	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 2 Section: 8,9,10
3	Hyperkalaemia and hypokalaemia Investigation of renal functions	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 2 Section:11,12,14,15
4	Urinalysis Acid-base: concepts and vocabulary Acid-base disorders: diagnosis and management	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 2 Section: 16,17,18,19,20,21,22,24
5	Proteins and enzymes as biomarkers in the blood Myocardial infarction	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 2 Section: 25,26,27

6	Liver function tests Diabetes mellitus: Diagnosis and monitoring	Traditional	Clinical Biochemistry: An Illustrated Colour Text-- Chapter 2 Section: 28,29,30,31,32,33,34
7	Clinical disorders of lipid metabolism Calcium homeostasis. Hypocalcaemia and hypercalcaemia	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 4 Section:66,67,68 Chapter 2 Section:35,36
8	Phosphate and magnesium homeostasis Bone diseases and bone biomarkers	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 2 Section: 37,38,39
9	Endocrine control Dynamic function tests Pituitary functions Growth disorders Midterm Exam	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 3 Section: 40,41,42,43
10	Thyroid function tests Hypothyroidism Hyperthyroidism	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 3 Section: 44,45,46
11	Hypofunction of the adrenal cortex Hyperfunction of the adrenal cortex	Traditional	Clinical Biochemistry: An Illustrated Colour Text- Chapter 3 Section: 47,48,49
12	Introduction to clinical nutrition Rational and criteria for appropriate nutrition support	Traditional	Krause's Food & the Nutrition Care Process - Part II: Section 13.1
13	Enteral nutrition access and administration Indications for uses & contraindication. Monitoring and Evaluation	Traditional	http://www.nutritioncare.org/ http://www.espen.org
14	Parenteral nutrition access and	Traditional	http://www.nutritioncare.org/

	administration **Indications for uses & contraindication.** **Monitoring and Evaluation**		**http://www.espen.org** **http://www.ins1.org**
15	**Refeeding syndrome** **Transitional feeding**	**Traditional**	**Krause's Food & the Nutrition Care Process - Part II: Section 13.6, 13.7**
16	**Final Exam**		

** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.*
*** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.*

Schedule of Asynchronous Interactive Activities *(in the case of e-learning and blended learning)*

Week	Task / Activity	Reference	Expected Results
1	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
2	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
3	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
4	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
5	Self-study	A selected topic	Assignment
6	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
7	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
8	Self-study	A selected topic	Assignment
9	**Midterm Exam**	-	-
10	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
11	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
12	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
13	Self-study	A selected topic	Assignment

14	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
15	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video / Assignment
16	**Final Exam**	**-**	**-**