The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	**PHARMACEUTICAL CLINICAL BIOCHEMISTRY**
2	Course number	**1203451**
3	**Credit hours (theory, practical)**	**2(theory)**
	Contact hours (theory, practical)	**32 (theory)**
4	Prerequisites/corequisites	**Prerequisite: Pathophysiology for pharmacy (1203301) + Biochemistry II (1203253)**
5	Program title	**Pharmacy**
6	Program code	
7	Awarding institution	**The University of Jordan**
8	Faculty	**Pharmacy**
9	Department	**Biopharmaceutics & Clinical Pharmacy**
10	Level of course	**undergraduate**
11	Year of study and semester (s)	**First semester of the 4th year**
12	Final Qualification	**Pharmacy**
13	Other department (s) involved in teaching the course	**NA**
14	Language of Instruction	**English**
15	Date of production/revision	**1 September 2015**

16. Course Coordinator:

Office numbers, office hours, phone numbers, and email addresses should be listed.
Dr. Areej Assaf
E-mail: areej_assaf@ju.edu.jo
Office No.: 132
Office hours to be announced

17. Other instructors:

18. Course Description:

This two hours credit course provides an overview of the key aspects of clinical biochemistry " the science behind many of the diagnostic tests used in medicine. This course provides the student with an introduction to the principles of the biochemical analysis of clinical samples and with an understanding of how biochemical investigations can be employed in the diagnosis, management, and prevention of disease. Case studies are used extensively to highlight and explain the biochemical disorders underlying clinical diseases.

19. Course aims and outcomes:

Program Competencies Achieved:

2.3 Identify pathophysiological basis of major human diseases and their effect on body fluid composition
2.4 Assess symptoms and diagnostic tests and correlate with associated disease.
2.17 Advise patients and other health professionals
2.20 Able to interpret patient biochemical laboratory results

A- Aims:

After completion of this course the student will be able to:

1. Describe the principle involved in the measurement of analytes in the clinical biochemistry laboratory.
2. Outline how biochemical analysis can be employed to differentiate between normal and diseased conditions.
3. Discuss the function, structure, laboratory investigation and diseases of the different body systems.
4. Describe how chemical and biochemical analysis are applied to the study of disease.
5. Outline a step-by-step approach to the use of the laboratory in diagnosis.
6. Correlate laboratory findings in clinical samples to pathological processes.
7. Perform complex data handling exercises associated with biochemical analysis.
8. At the end of this course, the student will be introduced to:
   a) The principles of laboratory tests and their use in diagnosis.
   b) The normal water and electrolytes balance in our body and the effect of diseases on this balance.
   c) The effect of the different diseases on renal function, calcium metabolism, lipid metabolism, amino acids and proteins, liver function and carbohydrate metabolism.

B- Course Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding: Student is expected to

A1- Demonstrate an understanding of quality management in and its relevance to patient management

A2- Understand the role of clinical biochemistry in clinical diagnosis

A3- Be proficient in the interpretation of results of routine clinical biochemistry investigations

A4- Have developed problem-solving skills relevant to the practice of clinical biochemistry

A5- Be familiar with the literature in Clinical Biochemistry and able to extract and present relevant information

A6- The student is expected to know and understand the followings:

A6.1- Biochemical Tests

Us of the laboratory, interpretation of results, and reference ranges.

A6.2- Water and Sodium Balance

Water, intake, AVP and the regulation of osmolality, sodium, aldosterone, hypernatraemia, and hyponatraemia.

6.3- Potassium

Potassium metaboloism, serum potassium, hyperkalaemia, and hypokalaemia.

A6.4- Hydrogen Ion Homoeostasis and Blood Gases

Hydrogen ion concentration, buffering, hydrogen ion excretion, role of the lungs and kidney, and acid-base disorders.

A6.5- Calcium, Phosphate, and Magnesium

Calcium metabolism, serum calcium, hypocalcaemia, hypercalcaemia, calcium and phosphate homeostasis, disorders of calcium, and phosphate and magnesium metabolism.

A6.6- The Kidney

Structure and function, tests of tubular functions, tests of glomerular function, and kidney disorders.

A6.7- The Liver

Structure and function, metabolism of bilirubin, markers of liver damage, markers of cholestasis, markers of function, liver disease, and potential pitfalls in the interpretation of liver profiles.

A6.8- Lipids and Lipoproteins

Triglycerides, cholesterol, and phosholipids, classification of lipoproteins, lipoprotein metabolism, and disorders of lipoprotein metabolism.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1- Explain molecular basis of diseases.

B2- Relate the signs and symptoms to the molecular basis of diseases.

B3- Relate the changes in water and electrolytes balance, hydrogen ion homoeostasis and blood gases to diseases.

B4- To interpret the changes in calcium metabolism to renal and bone diseases.

B5- Relate the changes in liver function tests to liver diseases.

B6- Relate the changes in carbohydrate metabolism, the plasma proteins, lipids and lipoproteins, to diseases.

C. Subject-Specific Skills: Student is expected to

C1- Students will be encouraged to read widely & to research the various topics using the assigned texts, libraries and relevant web sites

C2-The use of other information resources is essential if students are to gain maximum benefit from their studies.

C3- This approach to the subject is in part designed to encourage students to be more responsible for their own learning and to become lifelong learners

D. Transferable Key Skills: Students is expected to

D1- Develop of problem solving and critical thinking skills.

D2- Communicate effectively with the medical team concerning the use of laboratory tests in the diagnosis of diseases

D3- Interpret laboratory findings preformed in clinical practice.

D4- Use of videos and animation to effectively understand the concepts.

D5- The ability to use simple word and IT skills (i.e., data processing, software, internet, and multimedia) and the library to find information.

D6- The ability to be self-motivated learners and responsive to feedback.

D7- Working in team (i.e., sharing presentations and discussions and solving problem).

D8- Enhancement of research capability through working in independent projects.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction and specimen collection Blood and urine collection, factors affecting analyte determinations.	1st	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Water, electrolytes and acid-base disturbances Water, sodium and potassium balance, buffers, metabolic and respiratory acidosis and alkalosis.	2nd	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Calcium metabolism Calcium regulation, hypo- and hypercalcemia	6th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Investigation of renal function Acute and chronic renal failure, renal calculi.	7th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Lipid metabolism Lipoproteins metabolism, lipid profile and lipid disorders	9th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Amino acids and plasma proteins Aminoacidurea, albumin and immunoglobulins.	11th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Liver function and disease Liver function tests and their relations to liver diseases.	13th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Haematology	15th	Dr. Areej Assaf	A, B, C, D	Exams, Quizzes	**1 & 2**
Final Exam	16th				

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:

ILO/s	Learning Methods	Evaluation Methods
	Lectures	Exams, Quizzes
	Assignments	Homework
	Discussions	

Learning skills:

1. **Critical thinking**
2. **Digital literacy**
3. **Problem-solving skills**
4. **Communication skills**

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:

1. **Exams**
2. **Quizzes**
3. **Students reports on assignments**

23. Course Policies:

A- Attendance policies:

Attendance: Mandatory.

University regulations will be applied

B- Absences from exams and handing in assignments on time:

University regulations will be applied

C- Health and safety procedures:

NA

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The participation, the commitment of cheating will lead to applying all following penalties together

1) Failing the subject he/she cheated at

2) Failing the other subjects taken in the same course

3) Not allowed to register for the next semester. The summer semester is not considered as a semester

E- Grading policy:

Exams and Quizzes.

Mid Exam:	40 points
Quizz:	10 points
Final Exam:	50 points
Total	100 points

F- Available university services that support achievement in the course:

Classrooms, internet classes

24. Required equipment:

Data-show, internet connection and audio system.

25. References:

Required book (s), assigned reading and audio-visuals:

1- **Clinical Biochemistry: An illustrated colour text.** Gaw et al. Churchill Livingston.3rd edition. 2004. **ISBN: 443072698**
2- **Tietz Textbook of Clinical Chemistry.** Burtis et al. Saunders. 4th edition. 1994. **ISBN: 721644724**
3- **Clinical Chemistry in Diagnosis and Treatment**, Mayne P.D. 1994. **ISBN: 0340576472**
4- **Clinical Chemistry**, Marshall W.J.,2004. **ISBN: 0723433283**
5- **Textbook of Biochemistry with Clinical Correlations**
T.M. Devlin Editor, Wiley-Liss, John Wiley & Sons, Inc. 2011. **ISBN: 9780470281734**

1- Course Notes:
Lecture and Practical Notes. By staff members
2- Facilities Required for Teaching and Learning
- Audio-visual aids.
- Intelligent screen

26. Additional information:

Name of Course Coordinator: Dr. Areej Assaf -Signature: ---------- Date: Feb, 14, 2016

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: Nailya Bulatova Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File