**Course Syllabus**

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| **1** | **Course title** | Clinical Biochemistry I |
| **2** | **Course number** | 1203411 |
| **3** | **Credit hours** | 2 (theory) |
| **Contact hours (theory, practical)** | 32 (theory) |
| **4** | **Prerequisites/corequisites** | Prerequisite: Pathophysiology for pharmacy (1203301) + Biochemistry II (1203253) |
| **5** | **Program title** | PharmD |
| **6** | **Program code** | NA |
| **7** | **Awarding institution**  | The University of Jordan |
| **8** | **School** | Pharmacy  |
| **9** | **Department** | Biopharmaceutics & Clinical Pharmacy |
| **10** | **Course level**  | Undergraduate  |
| **11** | **Year of study and semester (s)** | The first semester of the 4th year |
| **12** | **Other departments (s) involved in teaching the course** | NA |
| **13** | **Main teaching language**  | English  |
| **14** | **Delivery method** | ☒face to face learning ☐Blended ☐Fully Online  |
| **15** | **Online platform(s)** | ☐Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others………… |
| **16** | **Issuing/ Revision Date**  | 10.10.2021 |

**17 Course Coordinator:**

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| Name: Dr. Shereen Aleidi Contact hours: (11- 12) Sun, Wed, ( anytime via teams)Office number: 325 Phone number: 23374Email: s.aleidi@ju.edu.jo |

**18 Other instructors:**

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| NA |

**19 Course Description:**

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| 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 |

**20 Course aims and outcomes:**

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| 1. **Aims:**
2. To identify the pathophysiological basis of major human diseases and their effect on body fluid composition
3. To increase students’ knowledge about symptoms and diagnostic tests and correlate with associated disease.
4. To provide students with the ability to differentiate between the different biochemical diseases.
5. To increase students’ knowledge about the vital organs and their diseases.
6. To provide students with the ability to interpret patient biochemical laboratory results
7. **Students Learning Outcomes (SLOs): Upon successful completion of this course students will be able to**

**A) Foundational knowledge**Develop, integrate, and apply knowledge from the foundational sciences in clinical biochemistry (learner)**Remember**1. Recall facts, terms, basic concepts, and information regarding: normal metabolic function and their disorders.
2. Describe the principle involved in the measurement of analytes in the clinical biochemistry laboratory.
3. Outline how biochemical analysis can be employed to differentiate between normal and diseased conditions.

**Understand**1. Discuss the function, structure, laboratory investigation and diseases of the different body systems.
2. Describe how chemical and biochemical analysis are applied to the study of disease.

**Applying** 1. Outline a step-by-step approach to the use of the laboratory in diagnosis.
2. Correlate laboratory findings in clinical samples to pathological processes.
3. Perform complex data handling exercises associated with biochemical analysis.

**B) Skills essential to practice for pharmacy**Proactively investigates new knowledge, approaches or behavior and takes steps to evaluate and improve performance (Self-learner)1. Proactively investigate, collect and interpret lab results through browsing the internet based professional web sites, medical guidelines & journal databases (MEDLINE, e-library)

**C) Attitudes and behaviors necessary for personal and professional development** Exhibit behaviors and values which are consistent with the trust given to the profession by patients, other healthcare providers, and society (Professional)10. Demonstrate integrity by not cheating and not committing plagiarism11. Demonstrate respect to professors and classmates by observing active listening inside the classroom**D) Learning skills:** * 1. Critical thinking
	2. Digital literacy
	3. Problem-solving skills
	4. Self-directed learning
	5. Communication skills
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**21. Topic Outline and Schedule:**

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| **Week** | **Lecture** | **Topic** | **Students Learning outcomes**  | **Learning Methods** **(Face to face, fully online, Blended)** | **Evaluation Methods\*\*** | **References** |
| 1 | 1.1 | Introduction to clinical biochemistry  | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |  Quiz/ Assignment /Exam | Specified in each lecture. General references are provided below |
| 1.2 |
| 2 | 2.1 | Specimen collection and sampling errors. | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 2.2 |
| 3 | 3.1 | Reference Range Determination | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |  Quiz/ Assignment /Exam |
| 3.2 |
| 4 | 4.1 | Water hemostasis | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 4.2 |
| 5 | 5.1 | Electrolytes hemostasis (Sodium and potassium balance) | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  | Quiz/ Assignment /Exam |
| 5.2 |
| 6 | 6.1 |
| 6.2 |
| 7 | 7.1 | Acid-base disturbances Buffers, metabolic and respiratory acidosis, and alkalosisCalcium and magnesium metabolismregulation, hypo- and hypercalcemia | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 7.2 |
| 8 | 8.1 | Quiz/ Assignment /Exam |
| **8.2** |  |  |
| 9 | 9.1 | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 9.1 |  |
| 9.2 |  |
| 10 | 10.1 | Investigation of renal function Acute and chronic renal failure, renal calculi. | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 10.2 |  | Quiz/ Assignment /Exam |
| 11 | 11.1 | Plasma proteins as clinical markers Total plasma protein test, Albumin, acute phase reactants, nonacute phase reactants. Immunoglobulins | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 11.2 |
| 12 | 12.1 | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 12.2 |
| 13 | 13.1 | Liver function and diseaseLiver function tests and their relations to liver diseases | A,B,C,D | Face to face lectures, Synchronous lecturing/meeting via MS teams  |
| 13.2 |  | Quiz/ Assignment /Exam |
| 14 | 14.1 | A,B,C,D |
| 14.2 |  |
| 15 | 15.1 | Final exam  |  |  |
| **15.2** |  |  |

* Teaching methods include: Face to face lectures, Synchronous lecturing/meeting via MS teams
* Evaluation methods include Assignments, Quizzes, Exams,

**22 Evaluation Methods:**

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| Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

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| **Evaluation Activity** | **Mark** | **Topic(s)** | **Period (Week)** | **Platform** |
| short Quiz | 15 | Renal disease, Kidney Function tests | 17.12.2021 |  |
| Face to face  |
| Assignment  | 5 | Calcium and Magnesium Balance  | 23.12.2021 | LM System |
| Midterm  | 30 | Introduction, Electrolytes, water balance, acid-base  | 2.12.2021 | Face to face  |
| Final Exam | 50 | All topics | 26.1.2022 | Face to face  |

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**23 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):**

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| **Students should have:*** Reference
* Computer
* Internet connection
* Active university account on Moodle (e-learning) website
* Active university account on Microsoft Teams
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**24 Course Policies:**

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| 1. Attendance policies:

**As per the applicable university regulations**1. Absences from exams and submitting assignments on time:

**As per the applicable university regulations**1. Health and safety procedures:

**Students should be vaccinated against COVID-19 in order to get their exams** 1. Honesty policy regarding cheating, plagiarism, misbehavior:

**As per the applicable university regulations**1. Grading policy:

**As per the applicable school bylaw**1. Available university services that support achievement in the course:

**Moodle (e-learning) website-LMSystem (exams)****Microsoft Teams institutional subscription** |
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**25 References:**

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| 1. Required book (s), assigned reading and audio-visuals:
2. An Illustrated Colour Text in Clinical Biochemistry 3rd edition, Gaw A et al. (ISBN 978-0443072697)
3. Tietz Fundamental of Clinical Chemistry. 5th edition, edited by Burtis C.A. and Ashwood E.R., 2001. (ISBN 9780721601892)
4. Clinical Chemistry. 5th edition, Marshall W.J., 2004. (ISBN 978-0723434559)
5. Textbook of Biochemistry with Clinical Correlations. T.M. Devlin Editor, Wiley-Liss, John Wiley & Sons, Inc. 7th Edition 2010 (ISBN 978-0-470-60152-5)
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**26 Additional information:**

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| Course Material and Announcements: Students need to use the e-learning page at the JU website to get all lecture handouts and guidelines which will be uploaded there. In addition, course-related announcements and exam results will be posted on the e-learning page and it is the responsibility of each student to check the site regularly. Username and password to access the course on the e-learning page will be provided to students in the beginning of the semester. Grievance Policy According to the general policies applied at the University of Jordan for grievance, when there is a complaint or conflict between a student and an academic/staff member or another student, the following procedures must be followed: 1. The student writes a formal complaint describing the situation of conflict to the Dean of the School or the President of the University.
2. Dean or President will first try to resolve the controversy by meeting/listening to both parties.
3. If the agreement was not possible, Dean or president forms an investigation committee which will follow, within a specified timeline, the general policies for relevant circumstances. The following points are considered:
4. The committee will meet/talk to both parties and witnesses (if applicable) within two weeks of conflict.
5. All meetings and discussions are documented according to the university policies.
6. Results/ recommendations will be sent to the Dean or President who is responsible for their implementation
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Name of Course Coordinator: **Dr. Shereen Aleidi**----------Signature: ----------------------- Date: 10.10.2021-----------

Head of Curriculum Committee/Department: ----- - Signature: ------------------------------------

Head of Department: --------- Prof.Nancy Hakooz ------------------------------- Signature: ------------------------------

Head of Curriculum Committee/Faculty: ---------------- Signature: ---------------------------

Dean: ---Prof.Rana Abu Dahab---------------- Signature: -------------------------------------------