Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Allied Medical Sciences Department

LM761 Adnanced Clinical Chemistry 1 - JNQF Level: 9

Second Semester 2023-2024

Course Catalog
3 Credit Hours. This advanced course delves into the fundamentals and principles of clinical chemistry pertaining to the analysis of body fluids for diagnostic and therapeutic purposes. Topics covered include advancements in clinical bioanalytical calculations, acid-base disorders, electrolyte disorders, hyperlipidemias, clinically significant enzymes, and laboratory diagnosis of conditions affecting the liver, kidneys, heart, pancreas, and bones. Additionally, the clinical chemistry of gastrointestinal disorders will be explored. The instruction encompasses both the physiology and pathophysiology of these disorders, in conjunction with laboratory testing methods.
Teaching Method: On Campus

Text Book	
Title	Tietz Textbook of Clinical Chemistry and Molecular Diagnostics
Author(s)	Carl A. Burtis, David E Bruns, MD, and Edward R Ashwood, MD
Edition	5th Edition
Short Name	Tietz Book, Handouts, and Selected Articles
Other Information	

Instructor	
Name	**Prof. Saleem Bani Hani**
Office Location	Vice dean office/ Faculty of Applied Medical Sciences
Office Hours	
Email	sabanihani@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Wed : 13:00 - 16:00
Room: N4206

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Main quality control topics in clinical chemistry laboratories I: Variables that affect tests and results as well as selecting, performing, and evaluating results of new and established laboratory tests.	**+ Articles and Handouts** From **Tietz Book, Handouts, and Selected Articles**
Week 2	Quality assurance based bioanalytical calculations-I (i.e., solutions preparation, dilution, buffer preparation, conversion between SI units, etc.)	From **Tietz Book, Handouts, and Selected Articles**
Week 3	Acid-base disorders-Pathologic changes in CO2 and serum bicarbonate that typically create abnormal arterial pH values.	From **Tietz Book, Handouts, and Selected Articles**
Week 4	Electrolyte disorders-I (Na+1, K+, Ca+2, Mg+2, Cl-1, PO4-3: Causes, clinical significance, related calculations, and sources of errors in their measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 5	Electrolyte disorders-II (Na+1, K+, Ca+2, Mg+2, Cl-1, PO4-3: Causes, clinical significance, related calculations, and sources of errors in their measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 6	Nonprotein nitrogen compounds-I (ammonia, urea, creatinine, uric acid, and amino acids)- biochemistry, physiology, normal ranges, clinical significance, related clinical chemistry calculations, and sources of errors in the measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 7	Nonprotein nitrogen compounds-II (ammonia, urea, creatinine, uric acid, and amino acids)- biochemistry, physiology, normal ranges, clinical significance, related clinical chemistry calculations, and sources of errors in the measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 8	Spectrophotometry and Fluorometry: Principles, advanced diagnostic calculations, enzymatic calculations, and quality control in measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 9	Hyperlipidemias: Types, biochemistry, clinical significance, diagnostic calculations, and advanced quality control in measurements.	From **Tietz Book, Handouts, and Selected Articles**
Week 9	Liver function and liver function tests: Biochemistry and pathophysiology, Clinical significance, diagnostic calculations, advanced quality control.	From **Tietz Book, Handouts, and Selected Articles**

Week 10	Cardiac function tests: Biochemistry and pathophysiology, clinical significance, advanced quality control.	From **Tietz Book, Handouts, and Selected Articles**
Week 12	Gastrointestinal Disorders: Clinical Chemistry Perspective	From **Tietz Book, Handouts, and Selected Articles**
Week 13	Special topics in Clinical chemistry.	From **Tietz Book, Handouts, and Selected Articles**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Analyze the fundamentals and principles of clinical chemistry relevant to diagnostic and therapeutic analysis of body fluids. [1SLO1] [1L9K2]	20%	
Apply advanced techniques in clinical bioanalytical calculations to interpret and evaluate laboratory results effectively. [1MSLO2] [1L9S1]	25%	
Assess and diagnose acid-base and electrolyte disorders, utilizing specialized knowledge and diagnostic tools. [1MSLO1] [1L9C1]	20%	
Evaluate the clinical significance of hyperlipidemias and enzymes, and their implications for diagnosis and treatment strategies. [1MSLO1] [1L9K1]	15%	
Employ laboratory diagnosis methods to identify and evaluate conditions affecting major organ systems such as the liver, kidneys, heart, pancreas, and bones, integrating knowledge of physiology and pathophysiology. [1MSLO2] [1L9S2]	20%	

Relationship to Program Student Outcomes (Out of 100%)											
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	MSLO1	MSLO2	MSLO3	MSLO4	MSLO5	MSLO6
20						35	45				

Relationship to NQF Outcomes (Out of 100%)				
L9K1	L9K2	L9S1	L9S2	L9C1
15	20	25	20	20

Policy	
Statement on Professionalism	Students are expected to maintain professional behavior at all times, as it is a minimum requirement for passing this class. Examples of unprofessional behavior include, but are not limited to: missing classes, being late, not paying attention to the speaker, talking to others during lectures, leaving lectures early without prior authorization from the instructor, working on material from other classes during class time, and sleeping during class.
Cheating	University regulations will be applied on cases of cheating and/or Plagiarism.

Cell phone	The use of cellular phones is strictly prohibited in classrooms and during exams. Cellular phones must be switched off during both classroom sessions and exams.
Attendance	Attendance points will not be counted for this class; however, attending lectures will significantly improve your grade. It is crucial for students to attend all classes as they are responsible for the information discussed during lecture sessions.
Absences	University regulations will be strictly enforced. Students are prohibited from exceeding an absence rate of more than 20% of lectures for any reason or excuse. Should a student surpass this limit, they will be ineligible to sit for future course exams. (Please refer to university regulations for further details).
Make-up Exam	Make-up exams are available to students who miss an exam with an accepted legal or medical excuse, provided it is endorsed by the instructor within 24 hours after the scheduled exam. (Please refer to university regulations for further details)
Feedback	Concerns, complaints, questions, and feedback are valued and encouraged as they are essential for the instructor's awareness and improvement. You can reach out to your instructor via email or during office hours.

Date Printed: 2024-02-25