Jordan University of Science and Technology

Faculty of Pharmacy

Pharmacy Department

PHAR775 General Studies In Toxicology - JNQF Level: 6

Second Semester 2024-2025

Course Catalog
3 Credit Hours. This course provides a comprehensive overview of the principles and methods of toxicology, examining the mechanisms by which xenobiotics affect living organisms. Students will explore methods of testing toxicity, including in vivo and in vitro studies, and how to select suitable biomarkers to reflect different toxicities.
Teaching Method: On Campus

Text Book	
Title	Hayes' Principles and Methods of Toxicology
Author(s)	Wallace Hayes; Tetyana Kobets
Edition	7th Edition
Short Name	Ref # 1
Other Information	https://www.google.jo/books/edition/Hayes_Principles_and_Methods_of_Toxicolo/95vKEAAAQBAJ?hl=en&gbpv=1&dq=general+studies+in+toxicology+pdf&pg=PA241&printsec=frontcover

Instructor	
Name	**Dr. Shreen Nusair**
Office Location	P2L0 - Office 118
Office Hours	Sun : 08:00 - 10:00 Mon : 10:00 - 12:00 Wed : 15:00 - 16:00 Thu : 11:00 - 12:00
Email	sdnusair@just.edu.jo

Class Schedule & Room
Section 2: Lecture Time: Sun : 10:00 - 13:00 Room: LAB

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Introduction to course policies and rules	From **Ref # 1**
Week 2	Introduction to principles of toxicology	**Chapter 1** From **Ref # 1**
Week 3	Acute toxicology testing	**Chapter 6** From **Ref # 1**
Week 4	Subchronic and chronic toxicology testing	**Chapter 7** From **Ref # 1**
Week 5	Acute dermal toxicity testing	**Chapter 8** From **Ref # 1**
Week 6	Acute ocular toxicity testing	**Chapter 9** From **Ref # 1**
Week 7	Toxicity testing for fertility and reproduction	**Chapter 10** From **Ref # 1**
Week 8	In vitro toxicology testing	**Chapter 12** From **Ref # 1**
Weeks 9, 10	Analyze toxicity studies and alternative methods	**Chapter 23** From **Ref # 1**
Weeks 11, 12	Design and present toxicity studies	From **Ref # 1**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Analyze toxicity studies [1L6S1, 1L6S3]	25%	Analyze toxicity studies
Demonstrate the ability to scientific Designing and presentation of toxicity studies [1L6C1, 1L6C4]	25%	Design and present Toxicity studies
Knowledge of basic principles and methods of testing toxicity [1L6K1, 1L6K2]	50%	Final exam

Relationship to Program Student Outcomes (Ou																						
PLO-PT1.1	PLO-PT2.1	PLO-PT2.2	PLO-PT3.1	PLO-PT3.2	PLO-PT3.3	PLO-PT3.4	PLO-PT3.5	PLO-PT3.6	PLO-PT3.7	PLO-PT3.8	PLO-PT3.9	PLO-MP1	PLO-MP2	PLO-MP3	PLO-MP4	PLO-PET1.1	PLO-PET2.1	PLO-PET2.2	PLO-PET2.3	PLO-PET3.1	PLO-PET3.2	

Relationship to NQF Outcomes (Out of 100%)					
L6K1	L6K2	L6S1	L6S3	L6C1	L6C4
25	25	12.5	12.5	12.5	12.5

Evaluation	
Assessment Tool	**Weight**
Analyze toxicity studies	25%
Design and present Toxicity studies	25%
Final exam	50%

Policy	
Exams	- Some exams are closed books and notes, others are open resources. - The Final exam is MCQ (covers all the material). - The final incomplete exams need approval from the dean.
Cheating	Prohibited; The commitment of the acts of cheating and deceit such as copying during examinations, altering examinations for re-grade, plagiarism of homework assignments, and in any way representing the work of others as your own is dishonest and will not be tolerated. Standard JUST policy will be applied. المادة 7: إذا ضُبط الطالب أثناء الامتحان أو الاختبار متلبساً بالغش فتوقع عليه العقوبات التالية مجتمعة: أ- اعتباره راسباً في ذلك الامتحان أو الاختبار. ب- الغاء تسجيله في بقية المساقات المسجل لها في ذلك الفصل. جـ- فصله من الجامعة لمدة فصل دراسي واحد، و هو الفصل التالي للفصل الذي ضبط فيه.
Attendance	- Attendance is mandatory and will be recorded regularly. - Excellent attendance is expected. - Students who miss more than 20% of the classes will be dropped from the course as per JUST policy. - If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.
Active learning and students participation	- Students are expected to actively participate in class discussions. Bonus marks may be provided on lectures for answering specific assigned questions or doing specific activity.
Laboratory	NA
Communicating with Instructors	- Students should communicate through their official JUST emails. Communication through personal email accounts (yahoo, Gmail, Hotmail, etc.) or social media will NOT be accepted, and no response will be provided. - Students are required to check their emails and the E-learning page of the course regularly for announcements and notifications.
Classroom Etiquette	- Respect o Respect people, places, and things. o Raise your hand to speak. o Listen respectfully. o Food and drink are not permitted in class. o Do not engage in aside conversations. - Participation or Disruption: o Do not hesitate to ask questions at any time, especially if you are unsure of something. o Listen to other students' questions to avoid asking the same question five minutes later. o Allow your classmates to participate in class discussions and refrain from taking advantage of all opportunities for active participation. - Cell Phones and Electronic Devices: o Texting is not permitted in class. o The use of cell phones, smartphones, or other mobile communication devices is disruptive and is therefore prohibited during class without permission. o Your phone should be turned off. If you must keep your phone on, you should set it to vibrate or silent mode and leave class if you receive an emergency call. o Except in emergencies, those using such devices must leave the classroom for the remainder of the class period. o Do not use your laptop in class for browsing the Internet or using social media while in class. - Missing a Class o Do not miss classes. It is not appropriate to ask the professor if you missed anything important if you miss class. Obviously, something of importance was missed, you missed a whole class! o Whenever you are absent from class, it is your responsibility to make up the work and to get notes, not your professor?s. o If you need to leave early, notify the instructor. - Be Punctual o Make sure you arrive to class on time.
Email Etiquette	- Type your email in the body of the email NOT in the subject line. - Provide a clear subject line. Keep it short and to the point, but not vague. Name, class, and what the email is specifically about should be in the subject line. - Body of the email: Your emails should always start with a formal greeting like you would in a letter, be brief (one screen length), check your spelling/grammar/punctuation, use a professional font (not decorative), and include a salutation aligned with your message (Thank you or Sincerely). - Avoid sending an email to your professor asking about grades or complaining about them. Schedule an appointment to meet in person to discuss areas for improvement if you have inquiries. - Consider the impression your tone will make in the email. It is recommended waiting 24 hours before sending an email or responding to an email if you are emotionally charged. - It is not appropriate to write in ALL CAPS. This conveys the impression that you are shouting at the recipient. - Make sure you read and reread your email before sending it. Make sure your emails are grammatically correct, have proper titles, and are properly spelled. - If you have multiple questions or the message runs long, you might consider revising the message or scheduling a face-to-face meeting. - You should double-check your ATTACHMENTS. Refer to your attachments within the body of your email. It is advisable to avoid attaching large files and to consider sending the document as a PDF. - Please allow sufficient time for a response. The sender and receiver should both allow sufficient time. As a rule of thumb, 24 work hours should be given. If sending emails after official work hours or during formal vacations, a delay in response is expected. Following that, if no response is received, you can follow up. - Effective Email Writing: Template for Email: subject, salutation, introduce your self, your request, closing remarks, your name.
First Assignments	Assignment #1: Analyzing and Critiquing a Toxicity Study Article (out of 25 Marks)

Policy

Description:

In this assignment, you will critically analyze a scientific article that investigates the toxicity of a specific substance, chemical, or compound. The goal is to evaluate the study's methodology, results, and conclusions, and to assess its strengths, limitations, overall contribution to the field of toxicology, and any recommendations to improve the methods. This exercise will help you develop skills in scientific critique, data interpretation, and understanding the design and execution of toxicity studies.

Tasks:

Article Selection and Summary (5%)

Select a peer-reviewed scientific article that focuses on a toxicity study. The article should include in vivo (animal) or in vitro (cell culture) experiments, or both.

Provide a brief summary of the article, including:

The substance being tested and its relevance.

The study's objectives and hypotheses.

The experimental design (e.g., sample size, control groups, dosage levels, duration).

Key findings and conclusions.

Methodology Critique (5%)

Evaluate the study's methodology. Consider the following:

Are the experimental methods appropriate for addressing the research question?

Are the sample size and control groups sufficient to draw valid conclusions?

Are the dosage levels and exposure durations realistic and relevant to real-world scenarios?

Are there any potential biases or confounding factors in the experimental design?

Data Analysis and Interpretation (5%)

Analyze the data presented in the study. Address the following:

Are the results clearly presented and statistically significant?

Do the authors provide sufficient evidence to support their conclusions?

Are there any inconsistencies or gaps in the data?

How do the findings compare to previous studies in the field?

Strengths and Limitations (5%)

Identify the strengths of the study. For example:

Does the study use innovative techniques or address a significant gap in the literature?

Are the findings impactful for regulatory or practical applications?

Discuss the limitations of the study. For example:

Are there methodological flaws or ethical concerns?

Are the conclusions overgeneralized or not fully supported by the data?

Implications and Future Directions (5%)

Discuss the broader implications of the study's findings. For example:

How do the results contribute to the understanding of toxicity mechanisms or risk assessment?

Are there any recommendations for regulatory agencies or industries based on the findings?

Suggest future research directions. For example:

What additional experiments or studies are needed to address unanswered questions or limitations?

Formatting and Submission Guidelines:

Length: 1500?2000 words (excluding references).

Format: Use a clear and structured format with headings for each section (e.g., Summary, Methodology Critique, Data Analysis, etc.).

Citations: Include proper citations for the article and any additional references used in your critique. Follow a consistent citation style (e.g., APA, MLA, or Chicago).

Submission: Submit your assignment as a PDF by the specified deadline.

Learning Objectives:

Develop critical thinking and analytical skills by evaluating scientific research.

Gain a deeper understanding of experimental design and data interpretation in toxicology.

Improve scientific writing and communication skills.

Learn to identify strengths, limitations, and implications of research studies.

Second Assignments Policy	Assignment #2: Designing a Toxicity Study (Out of 25 Marks) Description: In this assignment, you will design a hypothetical toxicity study to evaluate the effects of a specific substance, chemical, or compound on a biological system (e.g., in vivo animal models or in vitro cell cultures). The goal is to demonstrate your understanding of the key components of a toxicity study, including experimental design, ethical considerations, data collection, and analysis. This assignment will help you develop critical thinking and practical skills in designing scientific studies and applying toxicology principles. Tasks: Define the Research Question and Objectives (4 Marks) Clearly state the research question and objectives of your study. Explain the significance of the substance being tested and its relevance to toxicology or public health. Select the Experimental Model (4 Marks) Choose an appropriate experimental model (e.g., animal species, cell lines, or microorganisms). Justify your choice based on the research question, ethical considerations, and relevance to human or environmental health. Design the Experimental Protocol (6 Marks) Develop a detailed experimental protocol, including: Dosage levels and exposure routes (e.g., oral, inhalation, injection). Duration of exposure and observation periods. Control groups and sample size. Explain how these parameters were chosen and their relevance to the study. Data Collection and Analysis Plan (5 Marks) Describe the types of data you will collect (e.g., mortality, histopathology, biochemical markers). Outline the methods for data analysis, including statistical tests and tools. Explain how you will interpret the results to determine toxicity levels (e.g., LD50, NOAEL). Ethical Considerations and Limitations (4 Marks) Discuss the ethical considerations of your study, including adherence to animal welfare guidelines or biosafety protocols. Identify potential limitations of your study design and how they might impact the results. Presentation and Formatting (2 Marks) Present your study design in a clear, structured, and professional format. Use headings, subheadings, and proper citations (if applicable). Submission Guidelines: Length: 1000?1500 words (excluding references). Format: Use a clear and structured format with headings for each section (e.g., Research Question, Experimental Model, Protocol, etc.). Citations: Include proper citations if referencing external sources. Follow a consistent citation style (e.g., APA, MLA, or Chicago). Submission: Submit your assignment as a PDF by the specified deadline. Learning Objectives: Develop skills in designing scientific studies and applying toxicology principles. Understand the importance of ethical considerations and experimental rigor in toxicity studies. Learn to create a detailed and feasible experimental protocol. Gain experience in planning data collection and analysis methods.

Date Printed: 2025-04-12