The Hashemite University
Faculty of Science
Department of Physics

Department: Physics	
Year: 2025/2026	**Semester:** Fall

Course Information	
Course Title	Classical Mechanics II
Course Number	2201021352
Course Credits	Three credit hours
Course Duration	15 weeks
Instructor	Prof. Sharhabeel Alyones
Office hours	10:15-11:15 Mon, Wed
e-mail	salyones@hu.edu.jo

Textbook	
Title	Classical Dynamics of Particles and Systems
Authors	Stephen T. Thornton and Jerry B. Marion
Publisher	Cengage Learning
Year	2004
Edition	5rd edition

References
(1) " **Analytical Mechanics**" by Grant Fowles & George Cassiday, Seventh Edition, Thomson Brooks/Cole, 2005.
(2) "**Mechanics**" by Keith R. Symon, 3rd edition, Addison-Wesley publishing company. 1971

Evaluation Policy		
Assessment Type	Expected Date	Weight
HomeWorks	Every week	20%
First Exam	By the end of week # 4	20%
Second Exam	By the end of week # 8	20%
Final Exam	To be announced by the registration	40%

Chapter in Text	**Topics**	**Sections**
7	Hamilton's Principle Lagrangian and Hamiltonian Dynamics	1-11
8	Central Force Motion	1-8
9	Dynamics of a System of Particles	1-11
10	Motion in a Non inertial Reference Frame	1-4
11	Dynamics of Rigid Bodies	1-12
12	Coupled Oscillations	1-4

❖ **Specific Outcomes of Instruction (Course Learning Outcomes):**

After completing this course the students will be able to:

	Course Learning Outcomes (CLO)	(SO*)
CLO1.	Master many of the mathematical techniques necessary for follow-up courses in physics.	(a), (e), (k)
CLO2.	Be able to deal with real problems using analytical methods.	(a), (e), (k)
CLO3.	Applying the advanced methods of Lagrange and Hamilton to real physical problems.	(a), (e), (k)
CLO4.	Show ability to analyze the motion of a system of particles subject to several forces.	(a), (e), (k)
CLO5.	Be familiar with the properties of conservative forces and how to use these properties in solving real problems.	(a), (e), (k)
CLO6.	Be familiar with Kepler's laws and applying them to planetary motion.	(a), (e), (k)
CLO7.	Show ability to analyze rigid body motion.	(a), (e), (k)
CLO8.	Show ability to analyze coupled oscillations.	(a), (e), (k)

*(SO) = Student Outcomes Addressed by the Course.

❖ **Student Outcomes (SO) Addressed by the Course:**

#	Outcomes Description Applied and Natural Sciences Student Outcomes	Contribution
(a)	an ability to apply knowledge of mathematics, science, and applied sciences	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to formulate or design a system, process or program to meet desired needs	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify and solve applied sciences problems	H
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	M
(h)	the broad education necessary to understand the impact of solutions in a global and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	L
(k)	an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.	H

H = High, **M** = Medium, **L** = Low

Attendance:

Attendance will be strictly enforced according to current university regulations that require the attendance of at least 85% of the total number of lectures. Students are responsible for the material covered in the class. Missing an exam without a valid excuse earns you zero points. Makeup exams are given to those with valid excuses.