



**The University of Jordan**  
**Accreditation & Quality Assurance Center**

**Course Syllabus**

**Course Name:**

1	Course title	Classical mechanics II
2	Course number	0332352
3	Credit hours (theory, practical)	3.0
	Contact hours (theory, practical)	48
4	Prerequisites/corequisites	Math physics
5	Program title	BSc
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Physics
10	Level of course	300
11	Year of study and semester (s)	2016/2017 second semester(third year)
12	Final Qualification	
13	Other department (s) involved in teaching the course	non
14	Language of Instruction	English
15	Date of production/revision	

**16. Course Coordinator:**

Office numbers, office hours, phone numbers, and email addresses should be listed.

005,11:00-12:30, SUN and TUE, 23034, jkalifa@ju.edu.jo

**17. Other instructors:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

**18. Course Description:**

*As stated in the approved study plan.*

Revision of: Newtonian mechanics, oscillations. Gravitation, Some Methods in the calculus of Variations, Hamilton's principle, Lagrangian and Hamiltonian Dynamics, central force motion, dynamics of systems of particles.

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1. 19. Course aims and outcomes:

2.

A- Aims:

To understand Newtonian mechanics

To get familiar with the oscillations

To understand the gravitation phenomenon

To introduce the students to the calculus of variations

To understand Hamilton's Principle

To solve Problems on the Lagrangian and Hamiltonian Dynamics

To deal with central forces using equations

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

Understand the concept of gravitational potential

Understand the lines of force and equipotential surfaces in analogy with electrostatics

Solve problems on gravitation using Gauss's law for gravitation

Get familiar with the calculus of variations

Derive Euler's equation (first and second forms)

Solve typical problems on the calculus of variations

Understand the DELTA notation

Understand Hamilton's principle

Get familiar with the concept of generalized coordinates

Solve problems using generalized coordinates

Solve problems on the Lagrange's equations with Undetermined Multipliers

Show that Newton's and Lagrange's Equations are equivalent

Prove the conservation laws of: Energy, linear Momentum, and Angular Momentum

Use the concepts of Reduced mass and Center of Mass

Explain the Conservation Theorems: the first integral and Kepler's second law

Apply the equations of motion in solving some typical problems

Discuss Orbits in a Central Field with some examples

Explain Kepler's


**20. Topic Outline and Schedule:**

3.

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
4.	5.	6.	7.	8.	9.
10.	11.	12.	13.	14.	15.
16.	17.	18.	19.	20.	21.
22.	23.	24.	25.	26.	27.
28.	29.	30.	31.	32.	33.
34.	35.	36.	37.	38.	39.
40.	41.	42.	43.	44.	45.

46.

47.

**21. Teaching Methods and Assignments:**

Development of ILOs is promoted through the following teaching and learning methods:

- 5Es
- discussion in class
- Homeworks

**22. Evaluation Methods and Course Requirements:**

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

- Homeworks
- Exams

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**23. Course Policies:**

A- Attendance policies:

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

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

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

**24. Required equipment:****25. References:**

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

  
  
  
  
  
  
  
  
  
  

B- Recommended books, materials, and media: Classical Dynamics  
Thornton and Marion  
Fifth Edition

**26. Additional information:**

Name of Course Coordinator: ----jamil khalifeh-----Signature: ----j m khalifa----- Date:  
-----18.05.17----- Head of curriculum committee/Department: ----- Signature: -  
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Head of Department: ----- Signature: -----

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

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

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