



Institution: **College of Education at Zulfi**
Academic Department : **Department of Physics**
Programme : Second Level
Course : Classical Mechanics 2
Course Coordinator : Dr. Rasha abdalhai M. Taha
Programme Coordinator : Dr. Fatema Alzhra.M
Course Specification Approved Date : 1 / 1 / 1438 H

Course Specifications

A. Course Identification and General Information

1 - Course title :	Classical Mechanics 2	Course Code:	PHYS215
2. Credit hours :	3		
3 - Program(s) in which the course is offered:	Physics Program (B.Sc.)		
4 – Course Language :	Arabic		
5 - Name of faculty member responsible for the course:	Dr. Rasha Abdalhai		
6 - Level/year at which this course is offered :	3 rd		
7 - Pre-requisites for this course (if any) :	Classical Mechanics -1 (PHYS122)		
8 - Co-requisites for this course (if any) :	PHYS311		
9 - Location if not on main campus :	(.....)		
10 - Mode of Instruction (mark all that apply)			
A - Traditional classroom	☒	What percentage?	90 %
B - Blended (traditional and online)	☐	What percentage?	0 %
D - e-learning	☐	What percentage?	10 %
E – Correspondence	☐	What percentage?	0 %
F - Other	☐	What percentage?	0 %
Comments :			

B Objectives

What is the main purpose for this course?

1. Understand the basic concepts of classical mechanics e.g., center of mass, moment of inertia , central orbits motion, Lagrange mechanics, and Hamilton mechanics.
2. Acquire the necessary skills (e.g mathematical and numerical skills) to solve classical systems problems and gain deeper understanding of the concepts

C. Course Description

1. Topics to be covered

First: Theoretical Part



List of Topics	No. of Weeks	Contact Hours
Cartesian, cylindrical and spherical coordinates.	1	2
center of mass & moment of inertia	1	2
moment of inertia for some shape theories	1	2
central forces , central orbits motion and Kepler's laws	2	4
circular motion	1	2
variation calculus	2	4
Lagrange mechanics	2	4
Hamilton mechanics	2	4
Revision	1	2
Tutorials		
solve a problems Cartesian, cylindrical and spherical coordinates.	2	4
solve a problems on center of mass & moment of inertia	2	4
solve a problems on central forces and central orbits motion.	2	4
solve a problems on circular motion.	1	2
solve a problems on variation calculus	2	4
solve a problems on physical systems by using Lagrange and Hamilton mechanics	3	6
Revision	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30		30			60
Credit	30		15			45

3. Additional private study/learning hours expected for students per week.

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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Recognize the use of coordinates and determined in solving physics problems.	• Developing basic communicative • Ability through short and varied situated discourse. • Lecturing • Team work • Exercises	• exams. • Give the student questions after each lecture • Respond to what it cost the student from duties test
1.2	Recognizes the circular movement and their properties and applications.		
1.3	Recognize Central movement and their properties and applications		
1.4	Determine how to solve different systems using the mechanics of Lagrange and Hamilton		
1.5	It distinguishes between Newtonian mechanics and Lagrange and Hamilton		
2.0	Cognitive Skills		
2.1	converts between Coordinates Systems	• Problem solving • Class discussion • presentation • Individual meeting with the instructor (encouraging students to discuss different topics outside the classroom)	• exams. • Give the student questions after each lecture • Respond to what it cost the student from duties test
2.2	Solve problems at the center of mass and moments		
2.3	Derived equations of motion of objects in the central pathways		
2.4	Solve problems on the circular movement		
2.5	Concludes LaGrange Euler equation using mathematical methods heterogeneity		
2.6	Solve problems on the initial Lagrange and Hamilton		
3.0	Interpersonal Skills & Responsibility		
3.1	Students salving study	Learn how to search the internet and use	Individual and collective work and discussions
3.2	work with colleagues in a team spirit	Learn how to cover missed lectures	
3.3	able to diction and group discussion	Learn how to summarize lectures or to collect materials of the course	
4.0	Communication, Information Technology, Numerical		
4.1	Locating, evaluating and choosing credible textual and other sources for information	• Exercises • Problem solving • oral quizzes • Essay questions • Encourage students to use program soft wea	• Write reports • Exercises related to specific topics
4.2	Interpreting the social, legal, and ethical uses of information.		
4.3	Researching data and drawing conclusions based on an analysis of that data.		
4.4	Using technologies to communicate, solve problems, and complete tasks.		





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
5.0	Psychomotor		
5.1			

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Theoretical Midterm Exam	7 th	20
2	Homework, Quizzes, Discussions, Team Group, Projects & Lab		20
3	Experimental Final Exam	13 th	20
4	Theoretical Final Exam	15 th	40

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Two office hour per week

E. Learning Resources

1. List Required Textbooks :

Analytical Mechanics Valdis

2. List Essential References Materials (Journals, Reports, etc.)

1-Fundamentals of physics , Halliday et al

2- Stephen T. Thornton , and Jerry B. Marion, “Classical Dynamics of Particles and Systems” , 2004 (Fifth Edition), ISBN:0-534-40896-6, THOMSON

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

Software are available with the lecturer

5. Other learning material such as computer based programs/CD, professional standards or Regulations and Softw are.





F. Facilities Required

1. Accommodation

Lecture room, a smart board to write on and computer

2. Computing resources

Computer Lab. and internet lab.

3. Other resources

Library, and Seminar Room , Wi-Fi internet connections

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Course portfolio
- Discussion with my colleague
- Survey.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Electronic assessment
- Periodic Audit

3 Processes for Improvement of Teaching :

- Based on the recommendations of the plans and schedules and internal audit and visiting professors
- Encourage students to apply and dumping, and group discussions

4. Processes for Verifying Standards of Student Achievement

- * An independent study of a sample of student work
- Check marking of a sample of papers by others in the department.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Evaluate courses annually by the Quality Committee
- Updating the decisions that need to be developed annually
- The use of modern technological means for ease of explanation courses





Course Specification Approved

Department Official Meeting No (2) Date 1 / 1 / 1438 H

Course's Coordinator

Name : Dr. Rasha abdalhai M.
Taha

Signature :

Date : 3/1 / 1438 H

Department Head

Name : Dr. Fatema Alzhra.M

Signature :

Date : 3/ 1 / 1438 H

