Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Analytical Mechanics	FZ-6005		3 + 0	3.0	7.5

Prerequisites	None
Language of Instruction	Turkish
Course Level	Third Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Prof. Dr. İsmail TARHAN
Instructors	Prof. Dr. İsmail TARHAN
Assistants	
Course Objectives	The main objective of this course is to discussed the equations of motion, conservation laws, integration of the equations of motion, harmonic and non-harmonic oscillations, motion of a rigid body, canonical equations: Hamilton's equations.
Course Content	Topics to be covered in this course include are Lagrange's equation, the effect as a function of the coordinates, centripetal force problem, rigid body problem, integration of the equation of motion, harmonic oscillations, non-harmonic oscillations, exercises, Hamilton's equations, canonical transformation, Hamilton-Jacobi theory, introduction to continuous systems, continuous fields,
Course Learning Outcomes	1) Apply on the conservation laws of energy, momentum and angular momentum and apply them to the mechanical systems. 2) Analyze the mechanical systems with the different approaches 3) Define the motion in the central field and identify the harmonic and non-harmonic oscillations 4) Apply Hamilton´s equations to the mechanical systems. 5) Explain the canonical equations and the canonical transformation 6) Interpret knowledge and skills to solve the advanced classical mechanics problems

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Lagrange's equation	Oral lectures with interactive discussions, research, homework	
2. Week	The effect as a function of the coordinates	Oral lectures with	

Quick Access

Physics (PhD)
- Qualification Awarded
- Level of Qualification
- Qualification Requirements and Regulations
- Specific Admission Requirements
- Recognition of Prior Learning
- Profile of the Program
- Program Key Learning Outcomes
- Occupational Profile of Graduates
- Access to Further Studies
- Course Structure & Credits
- Exam Regulations & Assessment & Grading
- Graduation Requirements
- Mode of Study
- Programme Director(or Equivalent)
- Evaluation Questionnaire
- TYYÇ

Course Information
- Course Information
- Weekly Course Content
- Resources
- Assessment
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

		interactive discussions, research, homework	
3. Week	Centripetal force problem	Oral lectures with interactive discussions, research, homework	
4. Week	Rigid body problem	Oral lectures with interactive discussions, research, homework	
5. Week	Integration of the equation of motion	Oral lectures with interactive discussions, research, homework	
6. Week	Harmonic oscillations	Oral lectures with interactive discussions, research, homework	
7. Week	Non-harmonic oscillations	Oral lectures with interactive discussions, research, homework	
8. Week	Exercises	Oral lectures with interactive discussions, research, homework	
9. Week	Midterm exam	Oral lectures with interactive discussions, research, homework	
10. Week	Hamilton's equations	Oral lectures with interactive discussions, research, homework	
11. Week	Canonical transformations	Oral lectures with interactive discussions, research, homework	
12. Week	Hamilton-Jacobi theory	Oral lectures with interactive discussions, research, homework	
13. Week	Introduction to continuous systems	Oral lectures with interactive discussions, research, homework	
14. Week	Continuous fields	Oral lectures with interactive discussions, research, homework	
15. Week	Exercises	Oral lectures with interactive discussions, research, homework	

16. Week	Final exam	Exam	

RESOURCES

Recommended Sources
1- Landau, L.D., and Lifshitz, E.M., (1976). Mechanics. Vol. 1. Elsevier.
2- Taylor, J.R., (2005). Classical Mechanics. University Science Books.
3- Goldstein, H., “Classical Mechanics”, Addision-Wesley Publishing, 1980, USA.

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Mid-term exam + Assignment + Research & Project and Presentation 40%, Final Exam 60%		
In-Term Studies	**Quantity**	**Percentage**
Mid Term Exam 1	1	40
Total	1	40
End-Term Studies	**Quantity**	**Percentage**
Final Exam	1	60
Total	1	60
Contribution Of In-Term Studies To Overall Grade		40
End-Term Studies		60
Total		100

COURSE CATEGORY

Course Category	Percentage
Core Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5	DK6
PY1	5	5	5	5	5	5	5
PY2	5	4	4	4	4	4	4
PY3	5	5	5	5	5	5	5
PY4	4	5	5	5	4	4	4
PY5	5	5	5	5	5	5	5
PY6	4	4	4	4	4	4	4
PY7	4	4	4	4	4	4	4
PY8	4	4	5	5	5	4	4
PY9	5	5	5	5	5	4	4
PY10	4	4	4	4	4	4	4
PY11	3	3	3	3	3	4	4
PY12	4	4	4	4	4	5	5
PY13	4	5	5	4	4	4	4
PY14	4	4	4	4	4	4	4

PY15	4	4	4	4	4	5	5

*DK = Course's Contrubution.

	0	1	2	3	4	5
Level of contribution	None	Very Low	Low	Fair	High	Very High

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ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Final Exam	1	3	3
Presentation/Seminar	1	10	10
Class Hours (14 weeks)	14	3	42
Mid Term Exam 1	1	3	3
Preliminary Study	11	3	33
Assignment 1	1	12	12
Further Study	11	5	55
Research&Project	2	11	22
Mid Term Exam Preparation	1	12	12
		Total Workload	192
		Total Workload / 25.5 (s)	7.53
		ECTS Credit of the Course	8