Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
FİZ3010	**3**	**0**	**0**	**3**	**5**	**E**	**TR**	**3/SPRING**
Course Name (Turkish**)**	**Gök Mekaniği**							
Course Name (English**)**	**Celestial Mechanics**							

Unit/Program	Physics Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	Learning how the laws of classical mechanics are applied to the orbits of celestial bodies. Conservation laws and adaptation of the moment of inertia to the dynamics of celestial bodies
Course Outline	Classic mechanics. Kepler's and Newton's laws. Centripetal orbit. Two-body problem, elliptical, parabolic, hyperbolic trajectories. Equations of motion, methods of solving Kepler's equation, determination of orbital elements. Lambert's theorem. Artificial satellite orbits. The three-body problem is a general and restricted three-body problem.
Textbook/ Material / Resources	1. Astronomy Lectures I (Global Astronomy), Abdullah Kızılırmak 2. Astronomy Lessons II (Celestial Mechanics), Abdullah Kızılırmak
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Ankara University	**Physics**	**Celestial mechanics**	**2-2-0-3; 6**	**C**
Erciyes University	**Astronomy and Space Sciences**	**Celestial mechanics**	**2-2-0-4; 4**	**C**

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Instructors who can teach the course (Title, Name and Surname)	*Signature*

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)
Face-to-face courses will be taught under the supervision of the relevant faculty member.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/Laboratory**
1	Fundamentals of Dynamics	
2	Kepler and Newton's Laws	
3	Centripetal Orbit	
4	Two-Body Motion	
5	Propagation of Light	
6	Elliptical, Parabolic, Hyperbolic Trajectories	
7	Calculation of Trajectories	
8	Lambert Teoremi	
9	Midterm Exam	
10	Artificial Satellite Orbits	
11	Three- and N-Body Problem	
12	Perturbation Theory	
13	Zero Velocity Curves	
14	Double Fold Dots	
15	Final Exam	
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	60
	Engineering Sciences	40
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	1	2	2
Self-Study (including pre-class and exam preparation)	14	2	28
Make-up Exam	1	2	2
Experiment and Observation			
Class Participation (Theory)	14	3	42
Homework			
Final Exam Practice	1	2	2
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work	12	3	36
Argument	14	1	14
Application/Practice			
Other			
TOTAL WORKLOAD:			**126**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**5**

	Program Outcomes (PO) / **Learning Outcomes (LO)** *(Course Outcomes)*	1	2	3	4	5	6	7	8	9	10	11
1	Learn how the laws of classical mechanics are applied to the orbits of celestial bodies	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**1**	**1**
2	Understands the structure, formation, evolution of the universe; It evaluates the diversity of celestial bodies in the universe in a multifaceted way with scientific methods, both theoretical and observational	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**1**	**1**
3	Gain the ability to use basic physics and mathematics knowledge to understand Astronomy and Space Sciences	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**5**	**5**	**1**	**1**

Organizer: Prof. Dr. Ali YEŞİL
Preparation Date: 20.05.2024