Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
FİZ2005	**4**	**0**	**0**	**4**	**6**	**C**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Modern Fizik**							
Course Name (English**)**	**Modern Physics**							

Unit/Program	Physics Department/Undergraduate Program
Course Prerequisite	There are no prerequisites
Course Objectives	Learning the concepts of modern physics The transition from Classical Physics to Modern Physics and Basic principles and concepts of Relativistics and Quantum Physics
Course Outline	Special theory of relativity, Galilean and Lorentz transformations, relativistic mechanics, atomic structure of matter, quantization of light, black body radiation, photoelectric phenomena, waves and particles, de Broglie Hypothesis, uncertainty principle, wave mechanics, X-rays and Bragg diffraction, Compton phenomenon, Bohr-Sommerfeld atomic theory, comparison of the results of wave mechanics and Bohr's theory, quantum theory of the hydrogen atom, vector model of the atom and electron arrangement, molecular structure, molecular spectra; nuclear structure and radioactivity.
Textbook/ Material / Resources	Modern Physics in Science and Engineering, John R. Taylor, Chris D. Zafiratos, Michael A. Dubson Introduction to Modern Physics, Prof. Dr. Erol Gündüz, Ege ün. Publications
Internship Status	

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Ege University	**Physics**	**Modern Physics**	**3-1-2-0-7**	**C**
Yildiz Technical University	**Physics**	**Modern Physics**	**3-2-4-0-5**	**C**
Eskisehir Osmangazi University	**Physics**	**Modern Physics**	**3-0-3-0-5**	**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.)

The modern physics course provides an introduction to the basic concepts of quantum physics, solid-state physics, and nuclear physics.

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

The course will be explained to the students theoretically by compiling the sources.

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	Basic principles and concepts in modern physics	
2	Relativity	
3	Postulates of Relativity, Relativity of Time, Time Dilation, Shortening of Stature,	
4	Lorentz Transformation and its applications	
5	Relative Mechanics	
6	Atomic structure of matter, elements, atoms and molecules, electrons, protons and neutrons	
7	Milikan oil drop experiment, Rutherford atomic model	
8	Quantization of light, Plank and blackbody radiation, photoelectric phenomenon, x-rays and bragg Diffraction, Compton event	
9	Midterm Exam	
10	Wave property of matter, De Broglie Hypothesis, Uncertainty principle, Atomic models and one-dimensional Schrödinger denklemi	
11	General properties of molecules and molecular spectra	
12	Theory and application areas of solid state physics	
13	Structure of atomic nucleus and radioactivity	
14	Cosmic rays and elementary particles	
15	Finale	
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	100
	Engineering Sciences	
	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	3	3
Self-Study (including pre-class and exam preparation)	14	4	56
Make-up Exam	1	3	3
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	3	3
Laboratory			
Article Review			
Writing an Article			
Reading	10	1	10
Case Study			
Performance			
Problem Solution	14	1	14
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	7	1	7
Application/Practice			
Other			
TOTAL WORKLOAD:			**152**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**6**

The Relationship Between Course Learning Outcomes and Program Outcomes												
Program Outcomes (PO) / **Learning Outcomes (LO)** *(Course Outcomes)*		1	2	3	4	5	6	7	8	9	10	11
1	Know the basic principles and approaches of modern physics.	**5**	**5**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**1**	**2**
2	Students are familiar with the basic approaches and concepts of Modern physics.	**5**	**5**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**1**	**2**
3	Students have the knowledge that forms the basis of courses such as quantum physics, quantum mechanics, atomic physics, molecular physics, and solid state physics and nuclear physics.	**5**	**5**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**1**	**2**
4	Students know how to apply mathematical methods and principles of physics to analyze fundamental problems in modern physics.	**5**	**5**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**1**	**2**

5	Students can apply modern physics to atomic, nuclear, and solid-state systems.	**5**	**5**	**4**	**3**	**3**	**2**	**4**	**4**	**3**	**1**	**2**

Organizer: Prof. Dr. Mediha KÖK **Preparation Date:** 20.05.2024