Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
FİZ4003	**4**	**0**	**0**	**4**	**5**	**C**	**TR**	**4/FALL**
Course Name (Turkish**)**	Nükleer Fiziks							
Course Name (English**)**	Nuclear Physics							

Unit/Program	Physics Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To teach the nucleus and its constituent building blocks and the interactions between them and to give the necessary basic information about nuclear technologies.
Course Outline	Nuclear Properties, Radioactive Decay, Detection of Nuclear Radiation, Accelerators, Types of Decay, Nuclear Reactions, Nuclear Fission and Nuclear Fusion
Textbook/ Material / Resources	1. Introductory Nuclear Physics, P. E. Hodgson, E. Gadioli, and E. Gadioli Erba 2. Introductory Nuclear Physics, Kenneth S. Krane
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**

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.)

It will be taught using effective face-to-face learning methods with students

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	Overview & History, Introductory Termonology	
2	Nuclear Radius, Mass and Core Abundance, Nuclear Bond Energy, Nuclear Angular Momentum and Parity	
3	Law of Radioactive Decay, Radioactive Decay and Production	
4	Decay Types, Natural Radoactivity, Radioactive Life, Radiation Measurement Units	
5	Interaction of Radiation with Matter, Gas Filled Counters, Scintillation Detectors,	
6	Semiconductor Detectors, Count Statistics, Energy Measurement, Simultaneous Measurements, Nuclear Life Measurement, Other Detector Types	
7	Electrostatic Accelerators, Cyclatron, Sintetron, Linear Accelerators, Beam Colliders	
8	Cause of Alpha Decay, Basic Alpha Decay Processes, Alpha Decay Systematics,	
9	Midterm Exam	
10	Energy released in beta decay, Fermi theory in beta decay, double beta decay, beta spectroscopy	
11	Energized Gamma Decay, Classical Electromagnetic Radiation, Half-Life in Gamma Emission, Gamma Ray Spectroscopy	
12	Reaction Types and Ways of Preservation, Energized Nuclear Reactions	
13	Causes of Nuclear Fission : Characteristic of Fission, Energy Released in Fission Controlled Fission Reactions	
14	Basic Fusion Processes, Fusion Characteristics, Solar Fusion	
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	90
	Engineering Sciences	10
	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	3	42
Make-up Exam	1	2	2
Experiment and Observation			
Class Participation (Theory)	14	4	64
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	13	1	13
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			**125**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**5**

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	12
1	To be able to recognize the nucleus and its basic building blocks and the interactions between them	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**4**	**4**	**3**	**3**	
2	To be able to explain the basic issues related to the usage areas of nuclear technologies and nuclear safety	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**4**	**4**	**3**	**3**	
3	Will be able to explain the working principles of nuclear reactors	**5**	**5**	**5**	**4**	**3**	**3**	**4**	**4**	**4**	**3**	**3**	

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