PHYSICS IV (ITRODUCTION TO MODERN PHYSICS)

1	Course Title:	PHYSICS IV (ITRODUCTION TO MODERN PHYSICS)	
2	Course Code:	FEN3316	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	3	
6	Semester:	6	
7	ECTS Credits Allocated:	3.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:		
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. REMZIYE ERGÜL	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	ergulr@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	The course contributes to the questioning and research skills of the candidates by enabling them to grasp the ideas underlying the basic theories of modern physics and gain a new perspective for the physics course. The aim of this course is to explain the basic subjects and concepts of modern physics to prospective teachers and to make them comprehend the differences between classical physics and modern physics' approach to events.	
19	Contribution of the Course to Professional Development:	The course contributes to the questioning and research skills of the candidates by enabling them to grasp the ideas underlying the basic theories of modern physics and gain a new perspective for the physics course.	
20	Learning Outcomes:		
		1	Knows the basic concepts of modern physics.
		2	Defines the basic ideas and fundamental experiments that underlie the fundamental theories of modern physics.
		3	Explain important modern physics applications.
		4	Relates the basic concepts of modern physics to daily life.
		5	Apply knowledge of modern physics to solving simple problems.
		6	Recognizes scientists who have worked in the field of physics in the 20th century and has information about their work.
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21	Course Content:		
	Course Content:		

Week	Theoretical	Practice
1	Relativity, special relativity, Time dilation, Length contraction	
2	Relativity and mass, Mass and energy, massless particles.	
3	Lorentz transformation equations	
4	An overview of general relativity.	
5	Structure of the atom, Thomson, Rutherford and Bohr atomic models.	
6	Energy levels, atomic and molecular spectra	
7	Introduction to the quantum concept and photons	
8	blackbody radiation	
9	photoelectric effect	
10	Compton scattering	
11	Wave particle dilemma: Particle properties of waves De Broglie Waves	
12	Particle state in a Box, Uncertainty principle I and Uncertainty principle II.	
13	Introduction to quantum mechanics, Wave function	
14	Wave equation, time dependent Schrödinger equation, tunnel phenomenon.	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	10	3.00	30.00
Homeworks	4	8.00	32.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	1.00	1.00
Others	0	0.00	0.00
Final Exams	1	1.00	1.00
Total Work Load			92.00
Total work load/ 30 hr			3.07
ECTS Credit of the Course			3.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Midterm and end-of-year exams are taken into account in the assessment and evaluation of the course.

24	**ECTS / WORK LOAD TABLE**

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
ÖK2	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
ÖK3	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
ÖK4	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
ÖK5	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
ÖK6	5	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**		**3 Medium**		**4 High**			**5 Very High**						