DEPARTMENT OF CIVIL ENGINEERING
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
PHY 103	1			Fall
Title	**T**	**A**	**L**	**ECTS**
Modern Physics	3	1	1	6

Language	German					
Level	**Undergraduate**	✓	**Graduate**		**Postgraduate**	
Department / Program	Civil Engineering					
Forms of Teaching and Learning	Face to face					
Course Type	**Compulsory**	✓	**Elective**			
Objectives	The main purpose of this course is to teach the engineering students fundamental concepts of modern physics and to reinforce those concepts through via experiments and applications.					
Content	This course comprises a comprehensive content addressing fundamental physical interactions and the laws of nature. It encompasses classical physics topics such as conservation laws, harmonic motion, and waves, along with electromagnetic waves, wave optics, interference, and diffraction. Additionally, it includes foundational aspects of modern physics through blackbody radiation, the photoelectric effect, and the Bohr atomic model, extending to advanced topics such as quantum physics and laser technologies. The course also covers fundamental concepts of time, space, and motion within the framework of the theory of special relativity.					
Prerequisites	--					
Coordinator	Asst. Prof. A. Kazım Çamlıbel					
Lecturer(s)	Asst. Prof. A. Kazım Çamlıbel					
Assistant(s)	Res. Assist. Recep Özkan, Res. Assist. Uğur Yıldırım					
Work Placement	--					

Recommended or Required Reading	
Books / Lecture Notes	- Physik: Lehr- und Übungsbuch, Douglas C. Giancoli, 2019 - Halliday Physik, David Halliday, Robert Resnick, Jearl Walker, 2017
Other Sources	--

Additional Course Material	
Documents	--
Assignments	5 laboratory reports
Exams	1 midterm exam, 1 final exam

Course Composition		
Mathematics und Basic Sciences	50	%
Engineering	10	%
Engineering Design		%

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Social Sciences		%
Educational Sciences		%
Natural Sciences	40	%
Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	30
Quiz		
Assignments	5	20
Attendance		
Recitations		
Projects		
Final Exam	1	50
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	11	7	77
Assignments	4	5	20
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations	14	1	14
Laboratory	4	2	8
Projects			
Final Exam	1	4	4
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes

1	Students learn the main concepts in modern physics.
2	Students learn the main laws in modern physics.
3	Students can solve complicated problems.
4	Students can conduct fundamental experiments of modern physics and report their results.

Weekly Content

1	Introduction: physical theories, observations, interactions

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2	Simple harmonic motion
3	Waves and wave propagation
4	Sound waves
5	Kinetic theory of gases
6	Ray optics: reflection and refraction
7	Wave nature of light; interference
8	Ara sınav
9	Diffraction und polarization
10	Special theory of relativity
11	Special theory of relativity: energy and mass
12	Early quantum theory and atom models
13	Quantum mechanics
14	Atoms, molecules and solids
15	Nuclear physics and elementary particles
16	Final Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1	5						
2	5						
3	5						
4						5	

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=5728

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