

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY  
COURSE SYLLABUS

Course Details				
<b>Code</b>	<b>Academic Year</b>			<b>Semester</b>
PHY112	1			2
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>
Physics II	2	1	2	6
<b>Language</b>	German			
<b>Level</b>	<b>Undergraduate</b>	X	<b>Graduate</b>	<b>Postgraduate</b>
<b>Department / Program</b>	Molecular Biotechnology			
<b>Forms of Teaching and Learning</b>	Face-to-face			
<b>Course Type</b>	<b>Compulsory</b>	X	<b>Elective</b>	
<b>Objectives</b>	The students have gained knowledge and understanding of the most important phenomena of electrodynamics and optics and can explain and interpret them. They can transfer the knowledge to related phenomena and bring it into connection with everyday and current phenomena. The students are also familiar with the methods of experimental physics and relevant mathematical tools and can use them to solve scientific questions.			
<b>Content</b>	Electrostatics (field, flux, potential, Gaussian theorem, capacity), currents (resistance, Ohm's law, Kirchhoff's rules), magnetostatics (Lorentz force, Amperes law), electrostatics and magnetostatics in the medium (dielectricity, paramagnetism), induction and alternating currents (Faraday's law of induction, resonant circuits), electromagnetic fields and Maxwell's equations			
<b>Prerequisites</b>	None			
<b>Coordinator</b>	Assist. Prof. Dr. Neşe Aral			
<b>Lecturer(s)</b>	Assist. Prof. Dr. Neşe Aral			
<b>Assistant(s)</b>	Muhammed Cihat Mercan			
<b>Work Placement</b>	None			
Recommended or Required Reading				
<b>Books / Lecture Notes</b>	Halliday Physik, Wiley-VCH, 2016			
<b>Other Sources</b>				
Additional Course Material				
<b>Documents</b>				
<b>Assignments</b>				
<b>Exams</b>				
Course Composition				
<b>Mathematics und Basic Sciences</b>	80			%
<b>Engineering</b>	10			%

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Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences	10	%
Health Sciences		%
Expert Knowledge		%

**Assessment**

Activity	Count	Percentage (%)
Midterm Exam	1	60
Quiz		
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	40
<b>Total</b>		<b>100</b>

**ECTS Points and Work Load**

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	14	6	84
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations			
Laboratory	10	3	30
Projects			
Final Exam	1	3	3
<b>Total Work Load</b>			<b>162</b>
<b>ECTS Points (Total Work Load / Hour)</b>			<b>6</b>

**Learning Outcomes**

1	Having a theoretical understanding of electric and magnetic fields and being able to solve practical problems.
2	Being able to model and solve problems in engineering and advanced physics applications.
3	Being able to find relations of electric and magnetic field concepts with other science disciplines and with the environment.
4	

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**Weekly Content**

1	Electrical charge, Electrostatics
2	Coulomb's Law, Electrical Field
3	Gauss Law
4	Voltage, Electric Potential
5	Capacitors, Dielectrics
6	Electrical Current, Resistors, Ohm's Law, Electromotive Force
7	Direct Current Ciurcuits, Kirchhoff's Law
8	Magnetic Field, Magnetic Forces
9	Sources of Magnetic Field
10	Electromagnetic Induction, Faraday's Law
11	Magnetic Materials
12	Inductivity
13	Alternating current circuits (RLC)
14	Electromagnetic waves
15	

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

	P1	P2	P3	P4	P5	P6	P7
1	5	5		4		5	
2	5	5		4		5	
3	5	5		4		5	
4							
5							
6							
7							
8							

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9							
10							
11							
12							
<b>Contribution Level</b>		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
<p><b>P1 Working with modern scientific sources.</b></p> <p><b>P2 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.</b></p> <p><b>P3 Having theoretical and practical skills in the area of biotechnology.</b></p> <p><b>P4 Having foreign language skills to follow the worldwide advancements in the field of biotechnology and to be able to discuss them with foreign colleagues.</b></p> <p><b>P5 Having computational skills for research data analysis purposes.</b></p> <p><b>P6 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.</b></p> <p><b>P7 Having knowledge about work occupational work and safety.</b></p>							
<b>Compiled by:</b>		Neşe Aral					
<b>Date of Compilation:</b>		26.05.2021					