

COURSE INFORMATION					
Course Title	Code	Semester	L+P Hour	Credits	ECTS
ELECTROMAGNETISM & PLASMA PHYSICS	PHYS 621	3	4 + 0	4	10

<b>Prerequisites</b>	
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<b>Language of Instruction</b>	English
<b>Course Level</b>	Graduate
<b>Course Type</b>	Compulsory (Theory option)
<b>Course Coordinator</b>	Prof. Dr. Necdet Aslan
<b>Instructors</b>	Prof. Dr. Necdet Aslan
<b>Assistants</b>	
<b>Goals</b>	To discuss about the fundamental and advanced topics in Plasma Physics and Electrodynamics.
<b>Content</b>	Continuation of Plasma Physics 1

Learning Outcomes	Teaching Methods	Assessment Methods
1) Introduces the Fundamentals of single particle motion in plasma.	1,2,3	A,B,C
2) Teaches fundamentals of plasma as fluids: magnetohydrodynamics	1,2,3	A,B,C
3) Gets into the detail about electrodynamics and electromagnetic radiation physics	1,2,3	A,B
4) Investigates Cherenkov radiation and Bremsstrahlung radiation in detail	1,2,3	A,B

<b>Teaching Methods:</b>	1: Lecture, 2: Problem Sets
<b>Assessment Methods:</b>	A: Testing, B: Homework

COURSE CONTENT		
Week	Topics	Study Materials

1	Single particle motion	Plasma Physics
2	Plasmas as fluids, Magneto-hydrodynamics.	Plasma Physics
3	Laboratory plasma systems.	Plasma Physics
4	Fusion plasma properties.	Fusion Plasma Physics
5	Electromagnetic potentials.	Electrodynamics
6	Midterm Examination	
7	Oscillating electric dipole, and its radiation Radiation from a linear and Half-Wave antenna	Electrodynamics
8	Scattering of radiation, Lienard-Wiechert Potentials	Electrodynamics
9	Potential for charge in uniform motion, Field of an accelerated point charge	Electrodynamics
10	Cherenkov radiation	Electrodynamics
11	Bremsstrahlung	Electrodynamics
12	Bremsstrahlung	Electrodynamics
13	Final Exam	
14		
15		

<b>RECOMMENDED SOURCES</b>	
<b>Textbook</b>	Introduction to Plasma Physics and Controlled Fusion, Francis F. Chen, Plenum Press, ISBN:0-306-41332-9
<b>Additional Resources</b>	Physics for Scientists and Engineers, Douglas, C. Giancoli, Prentice Hall, ISBN:0-13-021517-1

<b>MATERIAL SHARING</b>	
<b>Documents</b>	
<b>Assignments</b>	From the textbook
<b>Exams</b>	Midterm and Final Exam

<b>ASSESSMENT</b>		
<b>IN-TERM STUDIES</b>	<b>NUMBER</b>	<b>PERCENTAGE</b>

Mid-terms	1	30
Homework Assignment	5	10
Final	1	60
<b>Total</b>		<b>100</b>
<b>CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE</b>		60
<b>CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE</b>		40
<b>Total</b>		<b>100</b>

<b>COURSE CATEGORY</b>	Expertise/Field Courses
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<b>COURSE'S CONTRIBUTION TO PROGRAM</b>						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Gets a sound base for the main fields of physics such as Classical Mechanics, Quantum Mechanics and Electromagnetism,					X
2	Gets the ability of interpreting, analysing, forming a synthesis and relationships between the main fields of physics and/or other sciences,					X
3	Obtains the education required for the measurements in scientific and technological areas and the contribution of physics in the industrial applications and on the macroscopic scale such as the society,				X	
4	Follows the up-to-date scientific developments, makes the analysis/synthesis for the new ideas and evaluates them,				X	
5	Uses the academic sources, the computer technology and the related devices,		X			
6	Joins the working and research groups, also the scientific meetings, communicates well at the national and international level,		X			
7	Gets the ability of creative and critical thinking, problem solving, researching, producing a new and original work, improving himself/herself in his/her own fields of interest,					X
8	Gains the concepts of ethics and responsibility. Undertakes the responsibility for the solutions to the problems related with his/her field as required for having an intellectual identity.		X			

<b>ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION</b>			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 16x Total course hours)	16	4	64

Hours for off-the-classroom study (Pre-study, practice)	16	4	64
Mid-terms	1	8	16
Homework	6	3	18
Final examination (with reparation)	2	10	20
<b>Total Work Load</b>			182
<b>Total Work Load / 25 (h)</b>			7.28
<b>ECTS Credit of the Course</b>			10