ELECTROMAGNETIC THEORY

1	Course Title:	ELECTROMAGNETIC THEORY	
2	Course Code:	FZK4009	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	7	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	5.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	There is no course prerequisite	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Doç. Dr. SEZER ERDEM	
15	Course Lecturers:	Yok	
16	Contact information of the Course Coordinator:	serdem@uludag.edu.tr, 0 224 2941772, Bursa Uludağ Üniversitesi, Fen-Edebiyat Fakültesi, Fizik Bölümü, Görükle Kampusü, 16059 Nilüfer/Bursa.	
17	Website:		
18	Objective of the Course:	The classical electromagnetism is the basic background of many current physical research area. So the aim of this course the teach the classical electromagnetism to the physics students with the detailed mathematical background in undergraduate level.	
19	Contribution of the Course to Professional Development:	known basic electromagnetic theory.	
20	Learning Outcomes:		
		1	Learn the use of mathematical expressions required for the electromagnetic theory course.
		2	Performs different applications related to electrostatic force, field, potential and energy.
		3	Learn the concepts of electrostatics and magnetostatics in matter and apply them to problems.
		4	Solve the problems related to different applications of magnetic force, field, energy and magnetic dipole moment created by steady currents.
		5	Learn the concepts of mutual inductance, self-inductance and Maxwell's equations.
		6	Learn the electric field, magnetic field, Poynting vectors of an electromagnetic wave and the relationship between them.
		7	
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		9	
		10	
21	Course Content:		
	Course Content:		
Week	Theoretical		Practice

1	Coulomb’s law, electrostatic field and potential.	
2	Gauss’s law and applications.	
3	Laplce’s and Poisson’s equations, electrostatic field energy.	
4	Steady currents, Biot-Savart’s law and applications	
5	Magnetostatic field laws, Ampere’s law.	
6	Vector potential, gauge invariance, magnetic dipole moment, Lorentz force. Midterm exam I+repeating courses	
7	Electrostatics and magnetostatics in materials.	
8	Electromagnetic induction, Faraday’s law, gauge invariance, magnetic field energy.	
9	Displacement current, Maxwell’s equations, electromagnetic waves, Poynting’s theorem.	
10	Lorentz transformations, special relativity theory.	
11	Geometry of space-time, relativistic mechanics.	
12	Covariant form of the electrodynamics.	
13	Electromagnetic field transformation relations. Midterm exam II+repeating courses	
14	Electromagnetic radiation.	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	5.00	70.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	12	5.00	60.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm Exams	1	2.00	2.00
Others	12	4.00	48.00
Final Exam	1	2.00	2.00
Total Work Load			182.00
Total work load/ 30 hr		6.07	
ECTS Credit of the Course			6.00

2.J.R. Reitz, F.J. Milford (1969), “Foundations of ... Wiley&Sons Inc.

23	Assesment		
TERM LEARNING ACTIVITIES	**NUMBE**	**WEIGHT**	
Midterm Exams	1	40	
Homeworks	0	0	
Final Exam	1	60	
Total		100	
Success Grade			
Contribution of Final Exam to Success Grade		60.00	
Total		100.00	
Measurement and Evaluation Techniques Used in the Course		The system of relative evaluation is applied.	

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	5	0	0	5	5	0	5	5	0	0	0	0	0	0

ÖK2	5	5	5	0	0	5	5	0	5	5	0	0	0	0	0	0
ÖK3	5	5	5	0	0	5	5	0	5	5	0	0	0	0	0	0
ÖK4	5	5	5	0	0	5	5	0	5	5	0	0	0	0	0	0
ÖK5	5	5	5	0	0	5	3	0	3	4	0	0	0	0	0	0
ÖK6	4	4	4	0	0	4	3	0	3	3	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**