ELECTROMAGNETIC FIELD THEORY

1	Course Title:	ELECTROMAGNETIC FIELD THEORY	
2	Course Code:	EEM2201	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	3	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	3.00	
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. UĞUR YALÇIN	
15	Course Lecturers:	Doç. Dr. Sibel YENİKAYA Doç. Dr. Esin KARPAT	
16	Contact information of the Course Coordinator:	uyalcin@uludag.edu.tr, +90 (224) 2942023, Bursa Uludağ Üniversitesi, Mühendislik Fak., Elektrik-Elektronik Müh. Bölümü Görükle / BURSA	
17	Website:		
18	Objective of the Course:	Historical development of electromagnetism, to search behavior of stable electromagnetic fields.	
19	Contribution of the Course to Professional Development:	To be able to follow innovations and apply them in the field by using the competence of collecting information, researching and analyzing	
20	Learning Outcomes:		
		1	The gain of ability to model and solve static electromagnetic fields problems using theoretical knowledge
		2	Gain the ability to identify, model, and solve complex engineering problems on electromagnetic fields; the ability to select and apply appropriate analysis and modelling methods for these problem
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21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	The electromagnetic model. Vector analysis.	
2	Orthogonal coordinate systems. Gradient. Divergence and Curl o of a vector field.	

3	Divergence and Stoke's theorem. Two null identities and Helmholtz's theorem.	
4	Coulomb's law.	
5	Gauss's law and applications.	
6	Electric potential. Electric flux density and dielectric constant.	
7	Boundary conditions for electrostatic fields. Capacitances and capacitors.	
8	Electrostatic energy and forces. Electrostatic boundary-value problems.	
9	Electrostatic boundary-value problems.	
10	Current density and Ohm's law. Kirchoff's current law. Joule's law.	
11	Resistance calculations. Magnetostatics in free space.	
12	Vector magnetic potential. The Biot-Savart law and applications.	
13	Magnetic field and relative permeability. Behavior of magnetic materials. Boundary conditions for magnetostatic fields.	
14	Inductances and inductors. Magnetic energy. Magnetic forces and torques.	

22	Textbooks, References and/or Other Materials:	1. Mühendislik Elektromanyetiğinin Temelleri, David K. Cheng, Palme Yayınları 2012. 2. Elektromagnetik Alan Teorisi, Bayrakcı H.E., Birsen

23	Activites		Number	Duration (hour)	Total Work Load (hour)
	Theoretical		14	3.00	42.00
	Assesment				
	Practicals/Labs		0	0.00	0.00
	Self study and preperation	**R**	14	1.00	14.00
	Homeworks		14	1.00	14.00
	Quiz	0	0.00		
	Projects		0	0.00	0.00
	Field Studies		0	0.00	0.00
	Final Exam	1	60.00		
	Midterm exams		1	25.00	25.00
	Others		0	0.00	0.00
	Contribution of Term (Year) Learning Activities to Success Grade		40.00		
	Final Exams		1	25.00	25.00
	Total Work Load				120.00
	Contribution of Final Exam to Success Grade		60.00		
	Total work load/ 30 hr				4.00
	ECTS Credit of the Course				4.00
	Measurement and Evaluation Techniques Used in the Course		Midterm Exam and Final Exam		

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	5	0	0	0	0	0	0	0	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