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:	6.00	
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:	Doç.Dr. UĞUR YALÇIN	
15	Course Lecturers:	Yrd. Doç. Dr. Esin KARPAT Öğr. Gör. Dr. Sevim KURTULDU	
16	Contact information of the Course Coordinator:	uyalcin@uludag.edu.tr, +90 (224) 2942023, 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:		
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	Midterm Exam + Review of past lectures	
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. Fundamentals of Engineering Electromagnetics, David K. Cheng, Prentice Hall, 1992. 2. Elektromagnetik Alan Teorisi, Bayrakçı H.E., Birsen Yayınevi 2000. 3. Elements of Electromagnetics, Sadiku M., 2nd Edition.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	**ECTS / WORK LOAD TABLE**

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	10	3.00	30.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	33.00	33.00
Others	0	0.00	0.00
Final Exams	1	33.00	33.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

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**