COMPUTER AIDED ANTENNA DESIGN

1	Course Title:	COMPUTER AIDED ANTENNA DESIGN	
2	Course Code:	EEM4214	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	2	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. UĞUR YALÇIN	
15	Course Lecturers:	-	
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:	The acquisition of basic knowledge and skills about design and analysis of various types of antennas.	
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	Gain the ability to identify, model, and solve complex engineering problems on various types of antennas; the ability to select and apply appropriate analysis and modelling methods for these problem.
		2	By applying modern design methods to design under realistic constraints and conditions, antennas with a complex systems.
		3	The gain of ability to the data gathering, the interpret of results for antenna engineering problems.
		4	
		5	
		6	
		7	
		8	
		9	
		10	
21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	NEC (Numerical Electromagnetics Code) software, historical development, capabilities and their underlying mathematical principles.	Introduction to NEC software.

2	Mathematical and physical antenna parameters.	The creation of computer aided model with NEC.
3	Basic antenna models: The horizontal and vertical wire dipoles in free space and on land the plane.	Applications of the horizontal and vertical wire dipoles in free space and on land the plane with NEC.
4	Wide band and high gain Yagi-Uda arrays.	Applications of wide band and high gain Yagi-Uda arrays.
5	Analyze the parameters of the antenna and linear array antennas.	Applications of analyze the parameters of the antenna and linear array antennas with NEC.
6	Elements that need to be considered in the creation of the antenna model, HF band folded and loop dipole antenna.	Elements that need to be considered in the creation of the antenna model, HF band folded and loop dipole antenna with NEC.
7	Folded and loop antennas.	Folded and loop antennas with NEC.
8	The frequency sweep analysis for Yagi-Uda arrays.	The frequency sweep analysis for Yagi-Uda arrays with NEC.
9	The optimum source and locate analysis for dipole antennas.	The optimum source and locate analysis for dipole antennas with NEC.
10	Models of the Earth's surface and antenna applications.	Models of the Earth's surface and antenna applications with NEC.
11	Analysis of the antenna in resistive and reactive loads.	Analysis of the antenna in resistive and reactive loads with NEC.
12	Presentation of SNEC software.	Applications of SNEC software.
13	Presentation of HFSS software.	Applications of HFSS software.
14	Presentation of FEKO software.	Applications of FEKO software.

22	Textbooks, References and/or Other Description – Theory,	1. C. A. Balanis, Anten Teorisi, 3. Basım (Türkçe), Nobel Kitabevi, 1992. 4. G. J. Burke, A. J. Poggio, Numerical Electromagnetics Lawrence Livermore Lab, 1981. 5. C. A. Thiele, "Wire Antennas" (Ch 2) in R. Mittra (Ed.) Hemisphere Publishing Corp. 1987.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	14	1.00	14.00
Homeworks	1	22.00	22.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	14.00	14.00
Others	0	0.00	0.00
Final Exams	1	14.00	14.00
Total Work Load			120.00
Total work load/ 30 hr	0	0.00	4.00
ECTS Credit of the Course			4.00

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Quiz	0	0.00
Final Exam	1	60.00
Total	3	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		Midterm Exam, Homework 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	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	5	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**			