



ÇANKAYA UNIVERSITY

Faculty of Engineering

Course Definition Form

This form should be used for either an elective or a compulsory course being proposed and curricula development processes for an undergraduate curriculum at Çankaya University, Faculty of Engineering. Please fill in the form completely and submit the printed copy containing the approval of the Department Chair to the Dean's Office, and mail its electronic copy to belmacanbay@cankaya.edu.tr. Upon the receipt of *both copies*, the printed copy will be forwarded to the Faculty Academic Board for approval. Incomplete forms will be returned to the Department. The approved form is finally sent to the President's office for approval by the Senate.

Part I. Basic Course Information

Department Name		Dept. Numeric Code	<input type="text" value="2"/> <input type="text" value="6"/>				
Course Code	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="2"/> <input type="text" value="1"/> <input type="text" value="2"/>	Number of Weekly Lecture Hours	<input type="text" value="3"/>	Number of Weekly Lab/Tutorial Hours	<input type="text" value="0"/>	Number of Credit Hours	<input type="text" value="3"/>
Course Web Site	http://ee212.cankaya.edu.tr					ECTS Credit	<input type="text" value="0"/> <input type="text" value="5"/>

Course Name

This information will appear in the printed catalogs and on the web online catalog.

English Name	Electromagnetic Wave Theory
Turkish Name	Elektromanyetik Dalga Teorisi

Course Description

Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog. Maximum 60 words.

This course covers the following subjects: Maxwell's equations and Constitutive Parameters, Solution of Wave Equations, Introduction to Antenna Radiation and Communication Systems, Telecommunication Essentials, Wave Propagation and Polarization, Transverse E.M. Modes in Lossy Media, Uniform Plane Waves in Unbounded Lossy Media, Reflection and Transmission, Radiation and Scattering Equations, Far field radiation, Rectangular Waveguides, Cavity Resonators.

Prerequisites (if any) <i>Give course codes and check all that are applicable.</i>	1 st	2 nd	3 rd	4 th
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="checkbox"/> Consent of the Instructor	<input type="checkbox"/> Senior Standing	<input type="checkbox"/> Give others, if any.	<input type="text"/>
Co-requisites (if any)	1 st	2 nd	3 rd	4 th
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Course Type <i>Check all that are applicable</i>	<input checked="" type="checkbox"/> Must course for dept. <input type="checkbox"/> Must course for other dept.(s) <input type="checkbox"/> Elective course for dept. <input type="checkbox"/> Elective course for other dept.(s)			

Course Classification					
<i>Give the appropriate percentages for each category.</i>					
Category	Mathematics & Natural Sciences	Engineering Sciences	Engineering Design	General Education	Other
Percentage	50	50	0	0	0

Part II. Detailed Course Information

Course Objectives
<i>Explain the aims of the course. Maximum 100 words.</i>
The aim of this course is to teach students the fundamentals of electromagnetic wave theory and radiation.

Learning Outcomes
<i>Explain the learning outcomes of the course. Maximum 10 items.</i>
1. Develop mathematical methods to analyze electromagnetic waves.

Textbook(s)				
<i>List the textbook(s), if any, and other related main course materials.</i>				
Author(s)	Title	Publisher	Publication Year	ISBN
Constantine A. Balanis	Advanced Electromagnetic Theory	Wiley	2012	978-0-470-58948-9

Reference Books				
<i>List the reference books as supplementary materials, if any.</i>				
Author(s)	Title	Publisher	Publication Year	ISBN

Teaching Policy

Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)

3 hours lectures

Laboratory/Studio Work

Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work, and list the names of the laboratories/studios in which these sessions will be conducted.

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Computer Usage

Briefly describe the computer usage and the hardware/software requirements in the course.

In-class demonstrations of Matlab and GnuRadio applications.

Course Outline

List the topics covered within each week.

Week	Topic(s)
1	Maxwell's equations and Constitutive Parameters
2	Solution of Wave Equations
3	Solution of Wave Equations
4	Introduction to Antenna Radiation and Communication Systems
5	Telecommunication Essentials I
6	Telecommunication Essentials II
7	Midterm Exam.
8	Wave Propagation and Polarization
9	Transverse E.M. Modes in Lossy Media, Uniform Plane Waves in Unbounded Lossy Media.
10	Reflection and Transmission
11	Reflection and Transmission
12	Radiation Equation
13	Far Field Radiation
14	Rectangular Waveguides, Cavity Resonators

Grading Policy

List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.

Assessment Tool	Quan.	Percen.	Assessment Tool	Quan.	Percen.	Assessment Tool	Quan.	Percen.
Homework			Case Study			Attendance		
Quiz			Lab Work			Field Study		
Midterm Exam	1	50	Class Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	50

ECTS Workload			
<i>List all the activities considered under the ECTS.</i>			
Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (<i>weekly basis</i>)	14	3	42
Attending Labs/Recitations (<i>weekly basis</i>)	0	0	0
Preparation beforehand and finalizing of notes (<i>weekly basis</i>)	14	2	28
Collection and selection of relevant material (<i>once</i>)	1	4	4
Self study of relevant material (<i>weekly basis</i>)	14	1	12
Homework assignments	0	0	0
Preparation for Quizzes	0	0	0
Preparation for Midterm Exams (<i>including the duration of the exams</i>)	1	10	15
Preparation of Term Paper/Case Study Report (<i>including oral presentation</i>)	0	0	0
Preparation of Term Project/Field Study Report (<i>including oral presentation</i>)	0	0	0
Preparation for Final Exam (<i>including the duration of the exam</i>)	1	15	15
TOTAL WORKLOAD / 25			116
ECTS Credit			5

Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.

Program Qualifications vs. Learning Outcomes						
<i>Consider the below program qualifications determined in terms of learning outcomes of all the courses in the curriculum and capabilities. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right..</i>						
No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to Electrical and Electronics Engineering; ability to apply theoretical and practical skills in these areas to complex engineering problems.					X
2	Ability to identify, define, formulate and solve complex Electrical and Electronics Engineering problems; for this purpose, developing skills to select and apply appropriate analysis and modeling methods.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions that meet certain requirements; for this purpose, developing skills to apply modern design methods.			X		
4	Ability to devise, select, and use modern techniques and tools required to analyze and solve complex problems encountered in Electrical and Electronics Engineering practice; ability to use information technologies effectively.			X		
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex problems or research areas related to Electrical and Electronics Engineering.		X			
6	Ability to function on intra-disciplinary and multi-disciplinary teams; ability to work independently.		X			
7	Ability to communicate effectively in oral and written Turkish; knowledge of at least one foreign language (English in particular); ability to write a report effectively and to comprehend a written report, ability to prepare reports on design and production, ability to make a presentation effectively, ability to give and receive clear and intelligible instructions.	X				
8	Awareness about the need for life-long learning; ability to access information, ability to keep abreast of the latest developments in science and technology, ability to continuously stay up-to-date.		X			
9	Act in compliance with ethical principles, awareness of professional and ethical responsibility; knowledge about standards for engineering practices.		X			
10	Knowledge about business solutions, such as, project management, risk management and change management; awareness about entrepreneurship, innovation; knowledge about sustainable development.	X				
11	Knowledge about global and societal impacts of engineering solutions on health, environment and safety, and engineering aspects of contemporary problems; awareness of legal consequences of engineering solutions.		X			
12						
13						

Contribution Scale to a Qualification: **0**-None, **1**-Little, **2**-Medium, **3**-Considerable, **4**-Largest

