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	2 6
Course Code	E E 2 0 9	**Number of Weekly Lecture Hours** 4 **Number of Weekly Lab/Tutorial Hours** 0	**Number of Credit Hours** 4
Course Web Site	http://ee209.cankaya.edu.tr	**ECTS Credit**	0 6

Course Name	
This information will appear in the printed catalogs and on the web online catalog.	
English Name	Electromagnetic Theory
Turkish Name	Elektromanyetik 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: Vectors Calculus, Static Electric Fields, Solution of Electrostatic Problems; Poisson's and Laplace's Equations, Boundary value problems in Cartesian Coordinates, Steady Electric Currents; Ohm's law, Equation of Continuity and Kirchhoff's law, Power Dissipation, Static Magnetic Fields, Time-Varying Fields and Maxwell's Equations.

Prerequisites (if any) *Give course codes and check all that are applicable.*	1st	2nd	3rd	4th
	☐ Consent of the Instructor	☐ Senior Standing	☐ Give others, if any.	
Co-requisites (if any)	1st	2nd	3rd	4th
Course Type *Check all that are applicable*	☒ Must course for dept.	☐ Must course for other dept.(s)	☐ Elective course for dept.	☐ Elective course for other dept.(s)

Course Classification
Give the appropriate percentages for each category.

Category	Mathematics & Natural Sciences	Engineering Sciences	Engineering Design	General Education	Other
Percentage	50	50	0	0	0

Part II. Detailed Course Information

Course Objectives
Explain the aims of the course. Maximum 100 words.

The aim of this course is to teach students the fundamentals of electromagnetism particularly in static electric and magnetic fields.

Learning Outcomes
Explain the learning outcomes of the course. Maximum 10 items.

1. Understand the necessary mathematical background (vector calculus and coordinate systems).
2. Develop mathematical methods to analyze static electric field.
3. Develop mathematical methods to analyze static magnetic field.
4. Develop mathematical methods to analyze steady electric current.

Textbook(s)
List the textbook(s), if any, and other related main course materials.

Author(s)	Title	Publisher	Publication Year	ISBN
David K. Cheng	Field and Wave Electromagnetics Second Edition	Addison Wesley	1989	0201128195

Reference Books
List the reference books as supplementary materials, if any.

Author(s)	Title	Publisher	Publication Year	ISBN

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

4 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 applications.

Course Outline
List the topics covered within each week.

Week	Topic(s)
1	Vector Analysis and Coordinate systems
2	Gradient of a Scalar Fields, Divergence of vector fields, Helmholtz's Theorem
3	Static Electric Fields; Postulates of Electrostatics, Coulomb's law, Gauss's law and applications
4	Capacitance and Capacitors, Electrostatic Energy and Forces
5	Solution of Electrostatic Problems; Poisson's and Laplace's equations
6	Solution of Electrostatic Problems; Boundary Value Problems in Cartesian Coordinates
7	Midterm Exam.
8	Steady Electric Currents; Current Density, Ohm's Law, Boundary Condition for Current Density
9	Equation of Continuity and Kirchhoff's Law, Power Dissipation
10	Static Magnetic Fields; Postulates of Magnetostatics, Vector Magnetic Potential
11	Biot-Savart Law and Applications.
12	Magnetic Energy, Magnetic Forces and Torques, Inductance and Inductors
13	Faraday's Law of Electromagnetic Induction
14	Time-Varying Fields and Maxwell's Equations;

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

List all the activities considered under the ECTS.

Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (*weekly basis*)	14	4	56
Attending Labs/Recitations (*weekly basis*)	0	0	0
Preparation beforehand and finalizing of notes (*weekly basis*)	14	2	28
Collection and selection of relevant material (*once*)	1	4	4
Self study of relevant material (*weekly basis*)	14	2	28
Homework assignments	0	0	0
Preparation for Quizzes	0	0	0
Preparation for Midterm Exams (*including the duration of the exams*)	1	10	15
Preparation of Term Paper/Case Study Report (*including oral presentation*)	0	0	0
Preparation of Term Project/Field Study Report (*including oral presentation*)	0	0	0
Preparation for Final Exam (*including the duration of the exam*)	1	15	15
TOTAL WORKLOAD / 25			146
ECTS Credit			**6**

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

No	Program Qualifications	Contribution				
	Program Qualifications vs. Learning Outcomes *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..*	**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

Part III New Course Proposal Information
State only if it is a new course

Is the new course **replacing** a former course in the curriculum**?**	Yes ☐	No ☒	Former Course's Code	Former Course's Name
Is there any similar course which has content **overlap** with other courses offered by the university**?**	Yes ☐	No ☒	Most Similar Course's Code	Most Similar Course's Name

Frequency of Offerings *Check all semesters that the course is planned to be offered.*	☒ Fall ☐ Spring ☐ Summer

First Offering	Academic Year	2 0 1 5 / 2 0 1 6	Semester ☐ Fall ☒ Spring

Maximum **Class Size** Proposed	90	Student **Quota** for Other Departments	5	Approximate **Number of Students** Expected to Take the Course	80

Justification for the proposal *Maximum 80 words*

Part IV Approval

	Faculty Member *Give the Academic Title first.*	Signature	Date
Proposed by	Dr. Öğr. Üyesi Göker Şener		30.07.2020

Departmental Board Meeting Date		Meeting Number		Decision Number	
Department Chair	Prof. Dr. Yahya Kemal BAYKAL	Signature		Date	

Faculty Academic Board Meeting Date		Meeting Number		Decision Number	
Dean	Prof. Dr. Sıtkı Kemal İDER	Signature		Date	

Senate Meeting Date		Meeting Number		Decision Number	