ECTS COURSE INFORMATION FORM

Faculty	**Faculty of Engineering**	
Program	**B.Sc. in Civil Engineering**	**Elective**
	B.Sc. in Computer Engineering	**N/A**
	B.Sc. in Electrical-Electronics Engineering	**Required**
	B.Sc. in Industrial Engineering	**Elective**
	B.Sc. in Mechanical Engineering	**N/A**

Course Code	EE 201			
Course Title in English	Circuit Analysis I			
Course Title in Turkish	Devre Analizi I			
Language of Instruction	English			
Type of Course	Flipped Classroom/Laboratory			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	15	70	15	-
Semester Offered	Fall			
Contact Hours per Week	Lecture: 3 hours	Recitation: -	Lab: 2 hours	Other: -
Estimated Student Workload	176 hours			
Number of Credits	7 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	MATH 115			
Expected Prior Knowledge	None			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	To learn the basic components and characteristics of electric circuits and how to analyze electric circuits with mathematical techniques.			
Course Description	This course aims to introduce the sophomore students the basic components and characteristics of electric circuits and the mathematical techniques to analyze electric circuits. The course content covers basic circuit components and their current-voltage characteristics, circuit theorems and equations, DC circuit analysis techniques, RC, RL and RLC circuits, time and frequency domain analyses of AC circuits. The theoretical lectures will be coupled by laboratory work.			
Course Description in Turkish	Bu ders ikinci sınıf öğrencilerini elektrik devrelerinin temel bileşenleri ve özellikleri ile elektrik devrelerini analiz edebilmek için gerekli matematiksel yöntemlerle tanıştırmaktadır. Ders içeriği temel devre bileşenleri ile onların akım-voltaj özelliklerini, devre teorem ve denklemlerini, DC devre analiz tekniklerini, RC, RL ve RLC devrelerini, AC devreleri için zaman ve frekans alanlarındaki analizleri içermektedir. Teorik derslere laboratuvar çalışmaları da eşlik etmektedir.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: 1. identify basic circuit components and their characteristics; 2. analyze electric circuits with mathematical techniques; 3. design electric circuits to meet given specifications; 4. construct electric circuits in the laboratory and analyze these circuits by making measurements; 5. conduct electric circuit experiments in the laboratory as a team work; 6. communicate effectively through a lab report.			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,2	Exams, Quizzes
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	S	3	Exams, Quizzes, Labs
(3) an ability to communicate effectively with a range of audiences	S	6	Format and Language of Lab Reports
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	S	5	Labs
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	H	4	Labs
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies			

Prepared by and Date	Asst. Prof. Dr. Ebru Arısoy Saraçlar / June 2019	
Semester	Fall 2019-2020	
Name of Instructor	Asst. Prof. Dr. Ebru Arısoy Saraçlar	
Course Contents	Week	Topic
	1.	Circuit Variables
	2.	Circuit Elements
	3.	Simple Resistive Circuits
	4.	Techniques of Circuit Analysis (Node-Voltage Method)
	5.	Techniques of Circuit Analysis (Mesh-Current Method)
	6.	Techniques of Circuit Analysis (Thevenin and Norton Equivalent Circuits, Superposition)
	7.	Inductance and Capacitance
	8.	Response of First Order RL and RC Circuits (Natural and Step Response of RL and RC Circuits)
	9.	Response of First Order RL and RC Circuits (General Solution for Step and Natural Responses)
	10.	Natural and Step Responses of RLC Circuits
	11.	Natural and Step Responses of RLC Circuits
	12.	Sinusoidal Steady-State Analysis (The phasor, passive circuit elements in the frequency domain)
	13.	Sinusoidal Steady-State Analysis (Circuit analysis in frequency domain)
	14.	Sinusoidal Steady-State Power Calculations
	15.	Final Exam/Project/Presentation Period
	16.	Final Exam/Project/Presentation Period
Required/Recommended Readings	Required: James W. Nilsson and S. Riedel Electric Circuits, Pearson, 10th Edition, 2014. Recommended: Richard C. Dorf and James A. Svoboda, Introduction to Electric Circuits, Wiley, 2013 (9th Edition)	

Teaching Methods	Contact hours using "Flipped Classroom" as an active learning technique
Homework and Projects	Homework questions will be assigned to the students and there will be quizzes containing questions from the homework assignments. There will be also pop quizzes related to lecture content.
Laboratory Work	Students will carry out experiments on Ohm's Law, Voltage Divider, Thevenin Equivalent Circuit, RL and RC Circuits, RLC Circuits and Sinusoidal Steady-State Analysis.
Computer Use	-
Other Activities	-
Assessment Methods	Types of assessment — Number — Ratio (%) Midterm Exam — 2 — 65 Quizzes — ~10 — 15 Laboratory — 7 — 12 Project — 1 — 08 Total — — 100
Course Administration	**Instructor's office and phone number**: 5th Floor, (0212) 3953677 **office hours:** TBA **email address:** saraclare@mef.edu.tr **Rules for attendance:** - **Late Policy:** Late lab reports and projects will NOT be accepted! **Missing a quiz:** No make-up will be given. **Missing a midterm**: Provided that proper documents of excuse are presented, a make-up exam will be given for each missed midterm. **Passing the course:** In order to pass the course, the students have to complete all the lab assignments and project assignment. There will be only one lab make-up session for the lab. No make-up will be given for the project. **A reminder of proper classroom behavior, code of student conduct**: YÖK Regulations **Academic Dishonesty and Plagiarism**: YÖK Regulations

ECTS Student Workload Estimation

Activity	No/Weeks	Hours			Calculation	Explanation
	No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
Lecture	14	2	3		70	A*(B+C+D)
Quizzes	10	2	0.5		25	A*(B+C+D)
Lab etc.	7	2	2	1	35	A*(B+C+D)
Midterms	2	14	2		32	A*(B+C+D)
Project	1	11	3		14	A*(B+C+D)
Total Workload					176	
Total Workload/25					7.04	
ECTS					**7**	