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**
Semester	**Fall 2017-2018**	

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 per semester			
Number of Credits	7 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	Prior knowledge in calculus and complex numbers is expected.			
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 be able to: 1. (a, e) identify basic circuit components and their characteristics; 2. (a, e) analyze electric circuits with mathematical techniques; 3. (a, c, e) design electric circuits to meet given specifications; 4. (b-1, b-2, c, e, g-1) construct electric circuits in the laboratory and analyze these circuits by making measurements.			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Program Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(a) an ability to apply knowledge of mathematics, science, and engineering	H	1,2,3	Exams, Quizzes
(b) an ability to design and conduct experiments, as well as to analyze and interpret data			
(b)-1. an ability to design/develop an experiment by identifying required assumptions, constraints, data collection methods and models	S	4	Labs
(b)-2. Implement experimental procedures to conduct an experiment and use engineering judgment to draw conclusions	H	4	Labs
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	S	3, 4	Exams, Quizzes, Labs
(d) an ability to function on multidisciplinary teams			
(d)-1. Function effectively on a intradisciplinary team	N		
(d)-2. Function effectively on a multidisciplinary team	N		
(e) an ability to identify, formulate, and solve engineering problems	H	1,2,3,4	Exams, Quizzes, Labs
(f) an understanding of professional and ethical responsibility	N		
(g) an ability to communicate effectively			
(g)-1. Communicate effectively with well-organized written documents	S	4	Lab Reports
(g)-2. Communicate effectively verbally with a range of audiences	N		
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	N		
(i) a recognition of the need for, and an ability to engage in life-long learning	N		
(j) a knowledge of contemporary issues	N		
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	N		

Prepared by and Date	Asst. Prof. Dr. Ebru Arısoy Saraçlar / June 2017	
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 Examination Period
	16.	Final Examination 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: Midterm Exams: Number 2, Ratio (%) 40 Quizzes: Number 5, Ratio (%) 15 Laboratory: Number 7, Ratio (%) 21 Final Exam: Number 1, Ratio (%) 24 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:** For lab reports, 10% daily penalty, down to 50%. **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. **Taking the final exam:** In order to take the final exam, the students have to complete all the lab assignments. There will be only one lab make-up session. **Missing a final**: Faculty regulations. **A reminder of proper classroom behavior, code of student conduct**: YÖK Regulations **Statement on plagiarism**: YÖK Regulations http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf

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	5	2	1		15	A*(B+C+D)
Lab etc.	7	1	3	3	49	A*(B+C+D)
Midterms	2	12	2		28	A*(B+C+D)
Final Examination	1	12	2		14	A*(B+C+D)
Total Workload					176	
Total Workload/25					7.04	
ECTS					**7**	

PROGRAM CRITERIA

Electrical and Electronics Engineering Program Criteria

1. Breadth in electrical-electronics engineering practice, analysis and design with 16 required course, and depth in one or more fields with 16 electives.
2. Knowledge of mathematics, including differential and integral calculus, basic sciences, computer science, and engineering sciences that is necessary for analysis and design of complex electrical and electronic devices, software, and systems containing hardware and software components.
3. Knowledge of probability and statistics, including application to Electrical and Electronics engineering; knowledge of advanced mathematics, including differential equations, linear algebra, complex variables, and discrete mathematics.

Note: For program-specific courses ABET Program Criteria of the related engineering program will be put here as before.