	Course name: EE213 Circuit Theory I		**Department:** Electrical and Electronics Engineering			Semester 5
	Methods of Education					Credit (ECTS)
	Lecture	Study Time	Homework	Exam (incl. Prep.)	Total	5
	50	55	15	30	150	

Language	English
Compulsory/Elective	Compulsory
Prerequisites	Math101 or Math102
Course Contents	Basic Concepts, Linear Time-Invariant ResistiveCircuits, Time-Varying and Nonlinear Resistive Circuits. Dynamic Elements, Operational Amplifier Circuits. First Order Circuits. First order linear differential equations with constant coefficients, Simple Second Order Circuits.
Course Objective	The aims of the course provide ability to apply knowledge of mathematics, science and engineering to Electronics and communication Engineering problems, İn addition, providing the concepts of Electric circuits, models and Circuits elements and giving an ability to apply knowledge of basic electrical circuit analysis
Learning Outcomes and Competences	Two-ports and multi-ports elements in electrical circuits, Kirchoff's current and voltages laws,analysis of resistor circuits using node voltage and mesh current methods analysis of second order RLC circuits.
Textbook and /or References	**Main texbooks :** 1. Fundamentals of Electric Circuits, C. K. Alexander and M. N. O. Sadiku, McGraw-HillBookCompany **Supplementary texbooks:** 2. ElectricCircuits, J. W. Nilsson and S. A. Riedel, Pearson Prentice Hall.

Assessment Criteria		If any, mark as (X)	Percentage (%)
	Midterm Exams	X	25
	Quizzes	X	15
	Homework	X	10
	Projects		
	Laboratory work		
	Other		
	Final Exam	X	50

Instructors	Assist. Prof. Dr. Thamer Al-Mashhadani

Weekly Schedule

Week	Subject
1	Charge and Current, Voltage, Power and Energy, Circuit Elements.
2	Basic lows: Ohm's Law, Nodes, Branches, and Loops, Kirchhoff's Laws.
3	Series Resistors and Voltage Division, Parallel Resistors and Current Division, Wye-Delta Transformations.
4	Methods of Analysis: Nodal Analysis, Nodal Analysis with Voltage Sources.
5	Mesh Analysis, Mesh Analysis with Current Sources.
6	Circuit Theorems: Linearity Property, Superposition, Source Transformation.
7	Thevenin's Theorem, Norton's Theorem.
8	Maximum Power Transfer, Capacitors and Inductors: Capacitors, Series and Parallel Capacitors.
9	**Mid-term Exam**
10	Inductors, Series and Parallel Inductors.
11	First order circuits: The Source-Free RC Circuit, The Source-Free RL Circuit, Singularity Functions.
12	Step Response of an RC Circuit, Step Response of an RL Circuit.

13	First-Order Op Amp Circuits, second order circuits: Finding Initial and Final Values.
14	The Source-Free Series RLC Circuit, the Source-Free Parallel RLC Circuit.
15	The Response of a Series RLC Circuit, the Response of a Parallel RLC Circuit.