UNIVERSITY of NICOSIA

Course Code	Course Title	ECTS Credits
ECE-100	Electric Circuits I	6
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	None
Type of Course	**Field**	**Language of Instruction**
Required	Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	1st	Dr George Gregoriou
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	MATH-190

Objectives of the Course:

The main objectives of the course are to:

- Provide the student with the fundamental knowledge of basic electrical concepts that will form a major part of the foundation required to analyze the most complex electrical and electronic systems.
- Develop a thorough understanding of the fundamental concepts of dc circuit analysis and their application to real-world problems.
- Develop an overall understanding of electrical laws and rules, methods of analysis, and network theorems, introduced via resistive, inductive, and capacitive dc circuits.
- Introduce the terminal behavior of the Transistor and the Operational Amplifier, so that they can be confidently used in practical designs.
- Arouse interest in further work and research in the area of electrical/ electronic engineering.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Use electrical rules and laws to calculate the voltage across and the current through each component of a dc circuit.
- Compare and apply the methods of circuit analysis, and network theorems.
- Analyze the terminal behavior of the Transistor and the Operational Amplifier and incorporate them in practical designs.
- Identify the physical principles, which explain the operation of inductors and capacitors and their effect on RL and RC circuits.
- Explain the natural and step response of RL and RC networks and analyze the behaviour of switching circuits.

Course Contents:

- Basic electrical concepts (current, voltage, resistance, power, energy, efficiency).

- Electrical laws and rules (Ohm's law, Kirchhoff's laws, VDR, CDR).
- The dc levels of a transistor network, dependent sources.
- The Operational Amplifier.
- Methods of analysis (d.c.) such as Mesh analysis, and Nodal analysis.
- Source Transformations.
- Network Theorems such as Superposition theorem, Thevenin's theorem and maximum power transfer, Norton's theorem.
- Inductance and Capacitance.
- The natural and step responses of RL and RC circuits. Switching circuits.

Learning Activities and Teaching Methods:

Lectures, in-class design examples.

Assessment Methods:

Homework, exams, final exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
James W. Nilson, Susan A. Riedel	Electric Circuits	Prentice Hall	2008	0131989251

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Robert L. Boylestad	Introductory Circuit Analysis	Prentice Hall	2007	0131988263
David J. Irwin, Mark R. Nelms	Basic Engineering Circuits Analysis	Wiley	2008	9780470128695