Course Title	Electronic Devices and Circuits				
Course Code	ETECH 170				
Course Type	Compulsory				
Level	First Cycle				
Year / Semester	First Year / Spring				
Teacher's Name	Heracles Heracleus				
ECTS	6	Lectures / week	1 ½	Laboratories / week	1 ½
Course Purpose and Objectives	The main objectives of the course are to: • Provide students with the fundamentals of semiconductor materials. • Introduce the characteristics and operation of electronic devices such as diodes, bipolar junction transistors (BJTs) and field effect transistors (FETs). • To analyze and design electronic circuits involving diodes, BJT, JFET and MOSFET. • Apply electronic circuits for common devices such as rectifiers, power supplies, stabilizers, logic gates and others. • Develop skills for troubleshooting and simulating electronic circuits. • Introduce students to the Operational Amplifier (Op-Amp) and its applications • Present the operation and applications of thyristors				
Learning Outcomes	After completion of the course students are expected to: • Have a good understanding of semiconductors • Explain the operation of diodes and transistors (BJTs and MOSFETS). • Know how to properly bias diode and transistor circuits • Design and setup circuits for small-signal amplification • Draw and analyze diode applications circuits such as rectifiers, regulators, power supplies, limiter circuits • Perform dc analysis (algebraically and graphically using current-voltage curves with superimposed load lines) and design of CB, CE and CC transistor circuits. • Apply circuit-analysis software to analyze the dc and small-signal operation of fundamental electronic circuits. • Use Op-Amps for commonly used applications in Electronics • Design circuits using thyristors in order to control the speed of motors, etc.				
Prerequisites	None		Required		None
Course Content	• Diodes and application of diodes (e.g. rectifiers, clipping and clapping circuits, Zener diodes, varactor diodes, voltage regulators)				

	- Bipolar Junction Transistors (BJTs) and biasing (use of BJT as a switch or amplifier, biasing methods, DC operating point, biasing configurations, troubleshooting of bias circuits) - Field Effect Transistors (FETs) and biasing (JFET characteristics and biasing, MOSFETs, MOSFET biasing) - Small-signal bipolar amplifiers (CE, CB, and CC ampliciers, multistage amplifiers, troubleshooting) - Operational amplifiers (Op-Amps) – Differential amplifiers, Negative feedback - Basic Op-Amp applications (summing amplifier, integrator, differentiator, etc - Thyristors (Diac and Triac)
Teaching Methodology	Lectures, in-class examples, exercises, practical.
Bibliography	<u>Compulsory</u> - Electronic Devices (2011), Thomas L. Floyd, Pearson Education, 9th Edition, ISBN: 978-0132668880 - Lecturers notes.
Assessment	Homework: 10% Participation: 10% Laboratory: 20% Mid Term: 20% Final Exam: 40%
Language	Greek