Course Title	Practical Electrical, Electronic and Digital Circuits				
Course Code	ETECH 215				
Course Type	Compulsory				
Level	First Cycle				
Year / Semester	Second Year / Spring				
Teacher's Name	Kallinikos Tsolias				
ECTS	6	Lectures / week	1 ½	Laboratories / week	1 ½
Course Purpose and Objectives	The main objectives of the course are to: • Introduce the student to the analysis, design and experimentation with basic electric, electronic, and digital circuits. • Bridge the gap between the idealized situations presented in the class and the real world of the laboratory. • Introduce the student to the fundamentals of electronic measurement techniques and instrumentation. • Help the future technician develop an understanding of test equipment while stressing up its use, application, and maintenance. • Provide the student with the basic knowledge of fault detection and circuit analysis. • Teach the student the required safety precautions when working with electricity. • Teach the students how to present experimental results and findings in a proper format of scientific report.				
Learning Outcomes	After completion of the course students are expected to be able to: • Design, set up, analyze and troubleshoot basic electric, electronic and digital circuits. • Validate models, laws and theorems through laboratory experimentation. • Analyze and discuss experimental results. • Demonstrate the ability to safely work with electricity and effectively use and calibrate laboratory equipment and instruments. • Demonstrate the ability to work in teams and effectively communicate with others. • Report experimental results and findings in a proper scientific format.				
Prerequisites	None	Required	None		
Course Content	Lab experiments on the following topics will be carried out: **Electric Circuits:** • Series-parallel resistive circuits including rheostats and potentiometers • Wheatstone bridge • Oscilloscope, sinusoidal Waveforms, and pulse waveforms • Thevenin's theorem and maximum power transfer to the load • Charging and discharging of capacitors				

	Electronic Circuits: • Half- and full-wave rectification • Biasing of Bipolar Junction Transistors (BJTs) • Small-signal amplification using CE and CB configurations of the BJT • JFET biasing and amplification circuits **Digital Circuits:** • Design of combinatorial circuits using Boolean algebra • Design of sequential circuits (e.g. counters) • Timers and applications • Analogue to Digital (A/D) converters
Teaching Methodology	Lectures, in-class examples, exercises, practical.
Bibliography	<u>Compulsory</u> • Experiments in Circuit Analysis to Accompany Introductory Circuit Analysis (2007), R. Boylestad and G. Kousourou, Prentice Hall, ISBN: 0132196158 • Lecturers notes.
Assessment	Homework: 10% Participation: 10% Laboratory: 20% Mid Term: 20% Final Exam: 40%
Language	Greek