

Course Title	Basic Electrical Principles				
Course Code	ETECH 100				
Course Type	Compulsory				
Level	First Cycle				
Year / Semester	First Year / Fall				
Teacher's Name	Hercules Heracleous				
ECTS	6	Lectures / week	3	Laboratories / week	One 3 hour lab per semester
Course Purpose and Objectives	<p>The main objectives of the course are to:</p> <ul style="list-style-type: none"> <li>• Provide students with the basic principles of electricity</li> <li>• Employ techniques for the analysis of electrical circuits</li> <li>• Explain the operation and characteristics of components and circuits commonly used in electrical installations</li> </ul>				
Learning Outcomes	<p>After completion of the course students are expected to:</p> <ul style="list-style-type: none"> <li>• Analyze basic electrical circuits using different methods and techniques</li> <li>• Evaluate voltages and currents across or through circuit components</li> <li>• Perform power and efficiency calculations for the characterization of systems or circuits</li> <li>• Differentiate between DC and AC systems</li> <li>• Analyze inductive and capacitive circuits</li> </ul>				
Prerequisites	None	Required	None		
Course Content	<ul style="list-style-type: none"> <li>• Definitions of current, voltage, power, efficiency, etc.</li> <li>• Circuit theorems, rules, and laws (Ohm's law, Kirchhoff's laws, voltage divider rule, current divider rule, etc.)</li> <li>• Series, parallel, and mixed resistive circuits</li> <li>• Methods of analysis (Mesh and Nodal methods)</li> <li>• Circuit theorems (Thevenin, maximum power transfer, superposition, etc)</li> <li>• Source transformations</li> <li>• Direct versus alternating current (DC Vs AC)</li> <li>• Capacitors and Inductors (series and parallel arrangement)</li> <li>• Impedance calculations</li> <li>• Phasor representation of sinusoidal currents and voltages</li> <li>• Power factor and effective power</li> <li>• Real and reactive power</li> </ul>				
Teaching Methodology	Lectures, in-class examples, exercises, practical.				

Bibliography	<p><u>Compulsory</u></p> <ul style="list-style-type: none"> <li>• Ray A. Jones and Jane G. Jones (2008), Safe Work Practices for the Electrician Jones &amp; Bartlett Publishers, ISBN:978-0763752156</li> <li>• Lecturers notes.</li> </ul> <p><u>Suggested</u></p> <ul style="list-style-type: none"> <li>• Charge Alexander and Matthew Sadiku (2008), Fundamentals of Electric Circuits, McGraw Hill, ISBN:978-0077263195</li> <li>• Mahmood Navhi and Joseph Edminister (2011) Schaum's Outline of Electric Circuits, McGraw Hill, 5th Edition ISBN:978-0071633727</li> </ul>
Assessment	<p>Homework: 10%</p> <p>Participation: 10%</p> <p>Laboratory: 20%</p> <p>Mid Term: 20%</p> <p>Final Exam: 40%</p>
Language	Greek