Course unit title:	Circuit Analysis I with Laboratory		
Course unit code:	AEEE222		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	1		
Semester when the unit is delivered:	2		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Lestas Marios		
Learning outcomes of the course unit:	• Develop competence in the use of Kirchoff's voltage law (KVL) and Kirchoff's current law (KVL) in simple resistive circuits. • Use KVL and KCL to determine currents voltages and power. Value the difficulty of these tasks for large circuits and the need of structured methods. • Appraise the importance of voltage and current divider rules in circuit analysis. • Develop an understanding of systematic analysis of linear resistive circuits using Mesh, Node Voltage method, Source Transformations and the principle of Superposition. • Comparison of the various methods and development of competence in choosing the most appropriate and efficient method to analyze a specific circuit. • Appraise the importance of Thevenin's Theorem. Develop competence in deriving the Thevenin equivalent circuit and calculate maximum power transfer to the load. • Understand the concept of impedance. Ac circuit analysis of simple R-L, R-C, and RLC circuits.		
Mode of delivery:	Face-to-face		
Prerequisites:	AMAT111, APHY111	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	• Systems of units, scientific notation. Current, voltage, resistance and their units. Voltage and current sources. • Ohms Law. Series and parallel combinations of resistors. • Kirchoff's voltage and current laws. Voltage and current divider rules. • Circuit analysis methods. Mesh Analysis, Node Voltage, source transformations. • Thevenin's and Norton's theorem, maximum power transfer, Superposition theorem. • Introduction to the concept of impedance. Introduction to ac circuit analysis. Simple R-L, R-C, and RLC circuits. Bridges.		
Recommended and/or required reading:			
Textbooks:	• J. Nilsson, S. A. Riedel, Introductory Circuits for Electrical and Computer Engineering, Prentice Hall 2002. • R. Boylestad, Introductory Circuit Analysis, 13th edition, Pearson, 2015.		
References:	• Allan R. Hambley, Electrical Engineering, 7th Edition, Pearson, 2014. • R. C. Dorf, J. A. Suoboda, Introduction to Electric Circuits, 9th edition, John		

	Wiley & Sons, 2013. • D. E. Johnson, J. R. Johnson, J. L. Hilburn, P. D. Scott, Electric Circuit Analysis, 3rd edition, Wiley & Sons, 1997.
Planned learning activities and teaching methods:	• Students are taught the course through lectures (3 hours per week) in classrooms or lectures theatres, by means of traditional tools or using computer demonstration. • Auditory exercises, where examples regarding matter represented at the lectures, are solved and further, questions related to particular open-ended topic issues are compiled by the students and answered, during the lecture or assigned as homework. • Topic notes are compiled by students, during the lecture which serve to cover the main issues under consideration and can also be downloaded from the lecturer's webpage. Students are also advised to use the subject's textbook or reference books for further reading and practice in solving related exercises. Tutorial problems are also submitted as homework and these are solved during lectures or privately during lecturer's office hours. Further literature search is encouraged by assigning students to identify a specific problem related to some issue, gather relevant scientific information about how others have addressed the problem and report this information in written or orally. • Laboratory experiments are carried out in small groups and lab reports are required two weeks after the laboratory class resulting in a cumulative mark. • Students are assessed continuously and their knowledge is checked through tests with their assessment weight, date and time being set at the beginning of the semester via the course outline. • Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constraints and revision timetable. • The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Assessment methods and criteria:	• Assignments 5% • Tests: 20% • Laboratory Work: 15% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No