

Course unit title:	Transmission Lines and Waves		
Course unit code:	AEEE313		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	4		
Semester when the unit is delivered:	8 (Spring)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Photos Vryonides		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Describe the fundamentals concepts of electromagnetic wave transmission. 2. Explain the various transmission media and their applications 3. Apply the theory of waves in transmission lines using Smith chart, line stub matching and quarter wave transformer. 4. Analyze theoretically and experimentally the propagation of electromagnetic waves in waveguides with emphasis on rectangular waveguides. 5. Use boards to gain practical experience through related lab experiments in the transmission and propagation of electromagnetic waves. 		
Mode of delivery:	Face-to-face		
Prerequisites:	AEEE 223, AEEE312	Co-requisites:	
Recommended optional program components:	None		
Course contents:	<p>Introduction to Waves: Electric and Magnetic Fields. Traveling Waves.</p> <p>Transmission Lines: Wavelength. Propagation modes. Modeling of transmission lines. Line parameters. Lossless and lossy lines. Reflection. Standing waves. VSWR. Input Impedance.</p> <p>Smith chart: Line stub matching and quarter wave transformer.</p> <p>Waveguides: Applications. Propagation modes. Governing equations. Cutoff frequency and wavelength.</p>		
Recommended and/or required reading:			
Textbooks:	F. T. Ulaby, <i>Fundamentals of Applied Electromagnetics</i> , Prentice Hall, 2015.		
References:	<p>C.R. Paul, K. W. Whites, S. A. Nasar, <i>Introduction To Electromagnetic Fields</i>, Third Edition, McGraw Hill, 1998.</p> <p>Dunlop and Smith, <i>Telecommunication Engineering</i> latest edition, Chapman and Hall.</p> <p>P.A. Rizzi "Microwave Engineering", Prentice-Hall Intern., editions, 1998</p> <p>David M. Pozar, "Microwave Engineering", John Wiley and Sons, Inc, fourth edition ,2012</p>		
Planned learning activities and teaching methods:	<p>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.</p> <p>Auditory exercises, where examples regarding matter represented at the lectures,</p>		

	<p>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.</p> <p>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.</p> <p>Laboratory experiments are carried out in small groups and lab reports are required two weeks after the laboratory class resulting in a cumulative mark.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> • Assignments 05% • Tests: 20% • Laboratory Work: 15% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No