



# EUROPEAN UNIVERSITY OF LEFKE

Electronics and Communication Engineering- Faculty of Engineering

## SYLLABUS

### 2020-2021 Spring Semester

Course Code	Course Title	Course Type	Weekly Course Hours			Credits	ECTS	Weekly Time Schedule
			T	A	L			
ECE403	Digital Communication	Compulsory	3	0	0	3	5	Tuesday 12:00-14:50
<b>Prerequisite</b>		<b>Prerequisite to</b>						
<b>Course Lecturer</b>	Soydan Redif					<b>Office Hours Schedule</b>		
<b>E-mail</b>						<b>Office / Room No</b>		
<b>Phone</b>						<b>Phone</b>		
<b>Teaching Assistant</b>						<b>Office / Room No</b>		
<b>E-mail</b>								
<b>Catalogue Descriptions</b>	Course starts with a review of probability and introduction to stochastic processes so as to understand channel behaviour. Digital modulation and demodulation methods explained with respect to analog modulation methods. Differences between analog and digital techniques and the importance of detectors. Base band signals and dimensionality theorem. Gramm Schmidt orthogonalisation procedure. Pulse code modulation, Nyquist sampling theorem, explanation of aliasing. Pulse amplitude modulation, Pulse position modulation and minimum eucladian distance between signals. Multiplexing methods. Digital Passband Transmission topics which include Additive White Gaussian Noise, Coherent and non-coherent digital modulation themes such as BPSK, DBPSK, BFSK, BASK, etc. Optical Communications.							
<b>Course Objectives</b>	To introduce to the students the concept of analog digitization using PCM, maximum-likelihood design, digital modulation and demodulation techniques, and performance of digital communication systems using error probability.							
<b>Learning Outcomes</b>	On successful completion of the course, students should be able to: (1) define and recognise stochastic processes and their relation to communications, (2) understand concepts related to vector spaces, dimensionality, basis functions, (3) understand the differences in various digital modulation methods, (4) calculate the probability of error, for a given digital modulation technique, (5) compare the performance of digital modulation techniques, (6) be able to model a modulation method and assess its performance using Matlab, (7) have basic understanding of today's popular modulation techniques.							
<b>Textbooks and/or References</b>	1	Digital Communications: Fundamentals and Applications, By Bernard Sklar, Prentice Hall, 2 nd ed, 2001.						
	2	Digital Communications, Fundamentals and Applications, Larsen & Keller 2017						
	3	Proakis J, Digital Communications 4th Edition, Mc. Graw Hill						
<b>WEEK</b>	<b>Date</b>	<b>TOPICS</b>						<b>Reference No - Section</b>
Week 1	01-05/03/21	Introduction and overview of Probability						1-Ch: 2.1
Week 2	08-12/03/21	Overview of Stochastic Processes and AWGN channel						1-Ch:2.2
Week 3	15-19/03/21	Baseband transmission techniques (dimensionality, Gramm Schmndtt)						1-Ch: 1.1, 1.2, 1.3, 1.4
Week 4	22-26/03/21	PAM, PPM, signals in baseband						1-Ch:4.2,
Week 5	29-02/03-04/21	Biorthogonal and antipodal signals in baseband						1-Ch:4.3
Week 6	05-09/03/21	Receivers (Correlation Type)						1-Ch: 5.1.2
Week 7	10-18/04/21	<b>Midterm Exams</b>						
Week 8	19-23/04/21	Receivers (matched filter)						1-Ch: 5.1.2
Week 9	26-30/04/21	Pass Band modulation techniques (PAM)						2-Ch: 4.2.4
Week 10	03-07/05/21	Pass Band modulation techniques (PSK)						2-Ch:4.2.2
Week 11	10-14/05/21	Pass Band modulation techniques (QAM)						2-Ch: 4.2.6,
Week 12	17-21/05/21	Pass Band modulation techniques (OFDM)						2-Ch: 4.2.3
Week 13	24-28/05/21	Probability of error						1-Ch: 5.2 2-Ch: 4.7
Week 14	31-04/05-06/21	Probability of error and performance of comunicaton systems						2-Ch: 12.1, 12.2, 12.3
Week 15	07-11/06/21	Introduction to optical communications and wideband techniques.						2-Ch: 12.1, 12.2, 12.3
Week 16	12-21/06/21	<b>Final Exams</b>						
<b>Evaluation Tools</b>	<b>Evaluation Tool</b>	<b>Quantity</b>	<b>Date</b>			<b>Weight in Total (%)</b>	<b>weight in Semester Evaluation (%)</b>	
	<b>Final Exam</b>	1	12-21/06/21			50		
	<b>Semester Evaluation</b>					50		
	<b>Midterm(s)</b>	1	10-18/04/21			50	100.0	
	<b>Quiz(zes)</b>							
	<b>Project(s)</b>							
	<b>Homework(s)</b>							
	<b>Laboratory works</b>							
<b>Attendance</b>								
*** Lifelong Learning Programme (LLP) ***			<b>Language of Instruction:</b>			English		