



# ESOGÜ Electrical-Electronics Engineering Department

**COURSE CODE:** 151228521 -151248521

**COURSE TITLE:** Wireless Communications

Semester	Weekly Hours		COURSE					
	Theoretical	Practical	Credits	ECTS	Type	Language		
7	3	0	3	5	Compulsory ( ) Elective (X)	Turkish ( ) English (X)		
Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).								
<b>Math and Basic Science</b>			<b>Electrical Engineering</b> [mark (√) if there is high design content]		<b>General Education</b>	<b>Humanities</b>		
			4 ( )					
<b>Assessment</b>			<b>THEORETICAL-PRACTICAL COURSES</b>			<b>LABORATORY COURSES</b>		
			<b>Type</b>	<b>Number</b>	<b>%</b>	<b>Activity Type</b>	<b>Number</b>	<b>%</b>
<b>Midterm</b>			Midterm	1	30	Quiz		
			Quiz	2	10	Lab performance		
			Homework	2	10	Report		
			Project	1	10	Oral exam		
			Other (Laboratory)			Other (.....)		
<b>Final</b>				1	40			
<b>Makeup exam (Oral/Written)</b>								
<b>Prerequisites</b>			None					
<b>Brief content of the course</b>			Radiowave propagation, Radiolinks, Satellite networks and link budget, Channel models for wireless communications, Multiple access techniques, Some wireless communication systems (GSM, WLAN, etc.)					
<b>Objectives of the course</b>			1. Understanding the aspects of radiowave propagation. 2. Calculation of link performances. 3. Knowledge on satellite networks. 4. Understanding channel models 5. Knowledge on multiple access techniques 6. Understanding some wireless communication systems such as GSM and WLAN					
<b>Contribution of the course towards professional education</b>			The architecture, analysis and design for wireless telecommunication systems are emphasized in this course.					
<b>Outcomes of the course</b>			Students who pass the course will be able to; 1. Have fundamental knowledge on radiowave propagation, wireless channel models, multiple access techniques and wireless systems. 2. Analyze and calculate the link performances for terrestrial and satellite links.					
<b>Textbook of the course</b>			Andreas F. Molisch, Wireless Communications, 2nd ed., John Wiley and Sons, 2011.					
<b>Other reference books</b>			Roger L. Freeman, Radio System Design for Telecommunications, 3rd ed., John Wiley and Sons, 2007.					
<b>Required material for the course</b>								

WEEKLY PLAN OF THE COURSE	
Week	Topics
1	Fundamentals of antennas for mobile and base stations
2	Radiowave propagation: Friis transmission equation, free space path loss, diffraction, atmospheric effects
3	Radiowave propagation: Fresnel zones, ground reflection, fading, diversity
4	Radiolinks: Fundamental link budget, modulation techniques, digital communication links
5	Satellite networks: Types of orbits, determination of look angles, link budget for C/N and G/T ratios
6	Satellite networks: Receive-only networks, Two-way links, SCPC links
7	Satellite networks: VSATs
8	Midterm
9	Midterm
10	Channel models: Narrowband models, wideband models
11	Channel models: Directional models, deterministic channel modeling methods
12	Multiple access techniques: FDMA, TDMA, CDMA
13	Wireless communication systems: History of GSM
14	Other wireless communication systems
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronics Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving problems of Electrical and Electronic Engineering	X			
2	Ability to identify, formulate and solve complex engineering problems in Electrical and Electronics Engineering and related fields, having skills to select and apply appropriate analysis and modelling methods for this purpose.	X			
3	Having skills to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements; ability to apply modern design methods for this purpose.				X
4	Having skills to develop, select and apply modern techniques and tools needed for applications in Electrical and Electronics Engineering, skills to use information technology effectively.				X
5	Skills to design and conduct tests, collect data, analyze and interpret the results for investigation of problems in Electrical and Electronics Engineering				X
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.			X	
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.			X	
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing				X
9	Understanding of professional and ethical responsibility				X
10	Information on project management, change management and risk management practices in business, awareness on entrepreneurship, innovation and sustainable development.				X
11	Information about universal and social effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				X

**Scale for assessing the contribution of the course to the program outcomes:**

**4: High**

**3: Medium**

**2: Low**

**1:None**

**Name of Instructor(s):** Prof. Dr. Gökhan ÇINAR

**Signature(s):**

**Date:**