



ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE:151228543-151248543 COURSE TITLE: Satellite Communication Systems

Semester	Weekly Hours		COURSE				
	Theoretical	Practical	Credits	ECTS	Type	Language	
Spring	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.).							
Math and Basic Science		Electrical Engineering [mark (√) if there is high design content]		General Education	Humanities		
0		3 ()		0	0		
Assessment		THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
Midterm		Type	Number	%	Activity Type	Number	%
		Midterm	1	20	Quiz		
		Quiz	2	10	Lab performance		
		Homework	2	10	Report		
		Project	1	20	Oral exam		
Final			1	40			
Makeup exam (Oral/Written)							
Prerequisites							
Brief content of the course		Satellite orbits, radiowave propagation, free space loss and atmospheric losses, analog and digital communication link budgets, satellite networks.					
Objectives of the course		Teaching radiowave propagation, link budget, satellite orbits and analysis and design of several types of satellite networks.					
Contribution of the course towards professional education		Providing the ability to analyze and design satellite communication systems.					
Outcomes of the course		<ol style="list-style-type: none"> 1. Define free space loss, Friis transmission equation, atmospheric effects on radiowave propagation. 2. Solve real engineering problems involving fundamental communication link budget. 3. Distinguish types of satellite orbits. 4. Define elevation and azimuth angles of an earth station. 5. Apply link budget analysis to different types of satellite networks. 					
Textbook of the course		Gökhan Çınar, "Uydu Haberleşme Sistemleri", Ders Notu, 2014.					
Other reference books		<ul style="list-style-type: none"> - Roger L. Freeman, "Radio System Design for Telecommunication", 3rd edition, Wiley-IEEE Press, 2007. - Dennis Roddy, "Satellite Communications", 4th edition, McGraw-Hill Professional, 2006. - Bruce R. Elbert, "Introduction to Satellite Communication", 3rd edition, Artech House Publishers, 2008. 					
Required material for the course							

WEEKLY PLAN OF THE COURSE	
Week	Topics
1	Review on electromagnetic waves and antennas.
2	Review on electromagnetic waves and antennas.
3	Orbital mechanics. Types of satellite orbits. Earth station look angles.
4	Free space loss. Atmospheric losses. Fundamental link budget.
5	Analog communication links.
6	Digital communication links.
7	Digital communication links.
8	Midterm
9	Midterm
10	Satellite footprint maps. Receive-only systems.
11	Single-terminal send&receive links.
12	Point-to-point links.
13	Very-small-aperture-terminal networks.
14	Very-small-aperture-terminal networks.
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering	X			
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.	X			
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.	X			
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.			X	
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic 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, awareness on entrepreneurship and innovation, knowledge on sustainable development.				X
11	Information about universal and societal 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 Çınar

Signature(s):

Date: