AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Microwave System Engineering								
Course Code	EEE513		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	Gain the concepts used in the radio communications Determine the RF system blocks To know about transmission lines which are used in RF-Microwave frequencies To know waveguide and microstrip circuit components which are used in RF-Microwave frequencies								
Course Content	Gain the concepts used in the radio communications Transmission lines and waveguides: Line equations, coaxial lines, waveguide, microstrip lines. Passive elements: Connector, attenuator, resonator and filters, directional coupler, isolator and circular coupler. Microwave tubes: Kistron, walking wave tube. Diodes: capacity diodes, parametric amplifiers, pin diodes, tunnel diodes, Gunn elements, IMPATT. Transistors: bipolar and field effect transistors, amplifiers, mixers, oscillators.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Case Study, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Assignment	8	20

Recommended or Required Reading	
1	Michael STEER, Microwave and RF Design : A System Approach, Scitech Publishing, Inc. 2009
2	Grigorios KALIVAS, Digital Radio System Design, John-Wiley, 2009
3	Pozar, “Microwave Engineering” Publisher: J Wiley Peter A. Rizzi, “Microwave Engineering Passive Circuits” Samuel Y. Liao "Microwave Devices and Circuits", Prentice-Hall

Week	Weekly Detailed Course Contents	
1	Theoretical	Radio Communications: System concepts, Propagation and noise.
2	Theoretical	Passive and active components used in transmitters and receivers: Transmisson lines, matching circuits, microwave filters.
3	Theoretical	Amplifiers, oscillators and other components
4	Theoretical	Two wire lines, coaxial lines,Strip Lines, Waveguides
5	Theoretical	Passive components: connectors, terminations, attenuators, phase shifters,baluns
6	Theoretical	Resonators, microwave resonators
7	Theoretical	Microwave filters
8	Intermediate Exam	Intermediate Exam
9	Theoretical	Ferrite componensts (isolators,circulators), Microwave Tubes
10	Theoretical	Diodes and Transistors
11	Theoretical	RF-Microwave Amplifiers
12	Theoretical	RF-Microwave Oscillator
13	Theoretical	RF-Microwave Mixers
14	Theoretical	Radar systems. Radiometer system.
15	Theoretical	Radar systems. Radiometer system.
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	8	4	5	72
Midterm Examination	1	10	3	13
Final Examination	1	14	3	17
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To define systems in radio communication
2	To solve the transmission line problems and to apply impedance matching techniques.
3	To understand modern transmitter and receiver structures and design principles.
4	Knowledge about fabrication and useage of passive microwave circuit components (connectors, attenuators, phase shifters, terminations,..)
5	Knowledge about RF-Microwave resonators and their excitations
6	Knowledge about RF-Microwave filters and ability to design and simulate RF filters
7	Knowledge about microwave tubes and their working prenciples
8	Knowledge about microwave diodes, transistors and their applications
9	Knowledge about about rf-microwave amplifiers, oscillators and mixers

Programme Outcomes *(Electrical and Electronics Engineering Master)*	
1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one’s own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5	L6	L7	L8	L9
P1	4	4	4	4	4	4	4	4	4
P2	4	4	4	4	4	4	4	4	4
P3	4	4	4	4	4	4	4	4	4
P4	4	4	4	4	4	4	4	4	4
P5	4	4	4	4	4	4	4	4	4
P6	4	4	4	4	4	4	4	4	4
P7	4	4	4	4	4	4	4	4	4