

Branch Name:	Signal Processing and Communication
Program Code:	ET214
Course Name:	RF System Design for Wireless Communication
Course Code:	2ET2140207T
Pre-requisite Course:	Fundamentals of RF and Wireless Communication

Course Objectives:

1. To know the fundamentals of RF design
2. To know the design consideration of radio architecture.
3. To design receiver system for RF.
4. To know the analysis of transmitter system design for RF.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40		-	-	-	100

Subject Contents

Sr. No	Topic	Total Hours	Weight (%)
1	Fundamentals of System Design: Linear Systems and Transformations - Nonlinear System Representation and Analysis Approaches - Noise and Random Process - Elements of Digital Base-Band System.	6	20
2	Radio Architectures and Design Considerations: Super heterodyne Architecture - Direct Conversion (Zero IF) Architecture - Low IF Architecture - Band-Pass Sampling Radio Architecture.	6	20
3	Receiver System Analysis and Design: Introduction - Sensitivity and Noise Figure of Receiver - Inter-modulation Characteristics - Single Tone Desensitization - Adjacent/Alternate Channel Selectivity and Blocking Characteristics - Receiver Dynamic Range and AGC System - System Design and Performance Evaluation.	10	30
4	Transmitter System Analysis and Design: Introduction - Transmission Power and Spectrum - Modulation Accuracy - Adjacent and Alternate Channel Power - Noise Emission Calculation - Some Important Considerations in System Design	10	20
5	Applications of System Design: Multimode and Multiband Super heterodyne Transceiver - Direct Conversion Transceiver.	6	10
	Total	38	100

List of Text Book:

1. “RF System Design of Transceivers for Wireless Communications”, Gu, Qizheng, 1st ed. Corr. 2nd printing, 2005, XIV, 479 p. 125 illus., Hardcover, Springer, ISBN: 978-0-387-24161

List of Reference Books:

1. “Radio Frequency and Microwave Communication Circuits, Analysis and Design”, D.K.Misra, John Wiley & Sons., inc, 2004.
2. “Microwave Engineering”, D.M. Pozar, Addison Wesley, 3rd Edition, 1990.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom’s Taxonomy Level
CLO1	Understand the needs of fundamentals of RF design	1 Remembering 2 Understanding
CLO2	Design radio architecture and RF receiver.	2 Understanding 5. Evaluate 3 Applying
CLO3	Know the analysis of transmitter system design for RF.	4 Analyze

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H				L	M							H	M	L	
CLO2	H		M	M	L					L		H		M	L	
CLO3		M	H		L									H		L

H: High, M: Medium, L: Low