SOFTWARE DEFINED RADIO

Course Code	20EC6701B	**Year**	IV	**Semester**	I
Course Category	Honors4	**Branch**	ECE	**Course Type**	Theory
Credits	4	**L-T-P**	3-1-0	**Prerequisites**	--
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes	
After successful completion of the course, the student will be able to	
CO1	Understand the principles of Software Defined Radio.(L2)
CO2	Choose appropriate digital signals for RF signal processing/ implementation. (L3)
CO3	Apply Digital Signal Synthesis for Generation and Implementation.(L3)
CO4	Analyse RF Signals and digital systems. (L4)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2: Medium, 1:Low)

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO1	2									2				
CO2	3				3					3			3	
CO3	2				2					2			2	2
CO4		3			3					3			3	3
Average* (Rounded to nearest integer	2	3								3			3	3

Syllabus		
UNIT No.	**Contents**	**Mapped COs**
I	**Introduction to Software Radio:** The Need for Software Radios, What Is a Software Radio, Characteristics and Benefits of a Software Radio, Design Principles of a Software Radio.	CO1,CO2
II	**Radio Frequency Implementation Issues**: The Purpose of the RF Front-End, Dynamic Range: The Principal Challenge of Receiver Design, RF Receiver Front-End Topologies, Enhanced Flexibility of the RF Chain with Software Radios, Importance of the Components to Overall Performance, Transmitter Architectures and Their Issues.	CO1,CO2, CO4

III	**Multirate Signal Processing:** Introduction, Sample Rate Conversion Principles, Polyphase Filters, Digital Filter Banks, Timing Recovery in Digital Receivers Using Multirate Digital Filters.	CO1,CO2, CO4
IV	**Digital Generation of Signals:** Introduction, Comparison of Direct Digital Synthesis with Analog Signal Synthesis, Approaches to Direct Digital Synthesis, Analysis of Spurious Signals, Spurious Components due to Periodic Jitter, Bandpass Signal Generation	CO1,CO3, CO4
V	**Digital Hardware Choices:** Introduction, Key Hardware Elements, DSP Processors.	CO1,CO3 CO4

Learning Recourses
Text Book(s)
1. Jeffrey H.Reed, "Software Radio: A Modern Approach to Radio Engineering" Reprint by Pearson Education & Inc 2002. 2. Joseph Mitola, III, Software Radio Architecture: Object Oriented Approaches to Wireless Systems Engineering, John Wiley and Sons, 2000.
Reference Book(s)
1. Markus Dillinger, K.Madani and N. Alonistioti, Soft Defined Radio, 1st Ed., Wiley
E-Resources
1. https://nptel.ac.in/courses/108107107 2. https://archive.nptel.ac.in/courses/108/107/108107107/