

Year & Sem: E1S2	Course Code: EC3601	Course Name: Microwave and RF Integrated Circuits	No. of Credits: 4	L 2	T&PS 2	P 0
UNIT - I: Introduction Block diagram or T/R module for a wireless communication system, Transmission lines, S-parameters, Smith chart, Impedance matching , Designing of lumped element L-matching networks using a Smith chart. Wideband PI- and T-networks. UNIT-II: Noise in Microwave Circuits Noise in Microwave Circuits :Dynamic Range and Sources of Noise Power and Equivalent Noise Temperature ,Measurement of Noise Temperature, Noise Figure ,Noise Figure of a Cascaded System, Noise Figure of a Passive Two-Port Network, Noise Figure of a mismatched Lossy Line Dynamic Range and Intermodulation Distortion ,Gain Compression Intermodulation Distortion Third-Order Intercept Point, Intercept Point of a Cascaded System UNIT – III : Active RF components RF Diode Characteristics: Schottky Diodes and Detectors ,PIN Diodes and Control Circuits Varactor Diodes, Other Diodes RF Transistor Characteristics: Field Effect Transistors ,Bipolar Junction Transistors(BJT)s Microwave Integrated Circuits Hybrid Microwave Integrated Circuits ,Monolithic Microwave Integrated Circuits UNIT-IV: RF Amplifiers Two-Port Power Gains , Stability ,Stability Circles, Tests for Unconditional Stability, Single-Stage Transistor Amplifier Design ,Design for Maximum Gain(Conjugate Matching) ,Constant Gain Circles and Design for Specified Gain ,Low-Noise Amplifier Design ,Broadband Transistor Amplifier Design ,Balanced Amplifiers , Distributed Amplifiers .Power Amplifiers Characteristics of Power Amplifiers and Amplifier Classes, Large-Signal Characterization of Transistors ,Design of Class A Power Amplifiers UNIT-V: RF Oscillators RF Oscillators: General Analysis Oscillators Using a Common Emitter BJT, Oscillators Using a Common Gate FET, Practical Considerations , Crystal Oscillators , Microwave Oscillators ,Transistor Oscillators , Dielectric Resonator Oscillators , Oscillator Phase Noise ,Representation of Phase Noise Frequency Multipliers: Reactive Diode Multipliers(Manley-Rowe Relations) Resistive Diode Multipliers ,Transistor Multipliers . UNIT-VI: RF Mixers Mixer Characteristics, Single-Ended Diode Mixer ,Single-Ended FET Mixer , Balanced Mixer ,Image Reject Mixer , Other Mixers , References/Text Books: 1. David M Pozar , “Microwave Engineering”, John Wiley, 3rd Edition, 2005 2. Guillermo Gonzalez , “Microwave Transistor Amplifiers Analysis and Design” ,prentice hall ,2nd Edition,1997. 3. Behzad Razavi ,”RF Microelectronics”, Prentice Hall,1997. 4. Joseph F. White , “High Frequency Techniques : An introduction to RF and Microwave Engineering “ ,IEEE press ,John Wiley & sons ,2004 5. Christopher Bowick , “ RF Circuit Design”, Newnes, ,2nd Edition, 2007. ISBN number:0750685182						

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

1. <http://nptel.ac.in/courses/117102012/>
2. <http://nptel.ac.in/courses/117101119/>

Study Materials (Web Links):

- 1.
- 2.

Problems & Solutions (Web Links):

- 1.
- 2.

Assignments (Web Links):

- 1.
- 2.