

Haryana Engineering College, Jagadhri

Lesson Plan of Electronics & Comm. Engineering Deptt. 8th Semester

Subject : Wireless & Mobile Communication (ECE-402N)

Objective of Course :

To introduce the concept of wireless / mobile communication using cellular environment. To make the students to know about the various modulation techniques, propagation methods and multiple access techniques used in the mobile communication.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Introduction to Wireless Communication Systems	Lecture	
Day 2	Evolution of mobile radio communications	Lecture	
Day 3	Examples of wireless comm. Systems	Lecture	
Day 4	Paging systems	Lecture	
Day 5	Cordless	Lecture	
Day 6	Telephone systems	Lecture	
Day 7	Comparison of various wireless systems	Lecture	
Day 8	Modern Wireless Communication Systems	Lecture	Assignment 1
Day 9	Second generation cellular networks	Lecture	
Day10	Third generation wireless networks	Lecture	
Day11	Wireless in local loop	Lecture	
Day12	Wireless local area networks	Lecture	
Day13	Bluetooth	Lecture	
Day14	Personal Area networks	Lecture	
Day15	Introduction to Cellular Mobile Systems	Lecture	
Day16	Spectrum Allocation	Lecture	
Day17	Basic Cellular Systems	Lecture	
Day18	Performance Criteria	Lecture	Assignment 2
Day19	Operation of cellular systems	Lecture	
Day20	Analog cellular systems	Lecture	
Day21	Digital Cellular Systems	Lecture	
Day22	Cellular System Design Fundamentals	Lecture	
Day23	Frequency Reuse	Lecture	
Day24	Channel assignment strategies	Lecture	
Day25	Handoff Strategies	Lecture	
Day26	Interference and system capacity	Lecture	
Day27	Tracking and grade off service	Lecture	Assignment 3
Day28	Improving coverage	Lecture	
Day29	Capacity	Lecture	
Day30	Multiple Access Techniques for Wireless Communication	Lecture	
Day31	Introduction to Multiple Access	Lecture	
Day32	FDMA	Lecture	

Day33	TDMA	Lecture	
Day34	Spread Spectrum multiple Access	Lecture	
Day35	Space division multiple access	Lecture	Assignment 4
Day36	Packet ratio	Lecture	
Day37	Capacity of a cellular systems.	Lecture	
Day38	Wireless Standards	Lecture	
Day39	GSM	Lecture	
Day40	IS-95	Lecture	
Day41	UMTS	Lecture	
Day42	IMT-2000	Lecture	
Day43	Signaling	Lecture	Assignment 5
Day44	Call Control	Lecture	
Day45	Mobility Management	Lecture	
Day46	Location Tracing	Lecture	

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Subject : Microwave Engineering (ECE-404N)

Objective of Course :

As a part of RF communication technology the purpose of this course is to create awareness about conventional microwave resonators, generators, components & devices along with the importance of scattering parameters so that one can able to design and apply these basic approaches in commercial as well as defense applications.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Microwave Resonators	Lecture	
Day 2	Brief description of waveguides	Lecture	
Day 3	Coplanar waveguides	Lecture	
Day 4	Cavity resonators: rectangular, cylindrical, spherical and coaxial	Lecture	Assignment 1
Day 5	Excitation and coupling of cavities	Lecture	
Day 6	Q factor	Lecture	
Day 7	Microwave Measurements	Lecture	
Day 8	Measurement of Frequency	Lecture	Assignment 2
Day 9	Impedance (using slotted section) attenuation	Lecture	
Day10	Power	Lecture	
Day11	Dielectric constant	Lecture	
Day12	Measurement of V.S.W.R.	Lecture	
Day13	Insertion loss and permeability	Lecture	Assignment 3
Day14	Microwave Generators	Lecture	
Day15	Construction Characteristic	Lecture	
Day16	Operating principle and typical applications of Klystron (two cavity, multi cavity)	Lecture	
Day17	Reflex Klystron	Lecture	
Day18	Magnetron (Cylindrical magnetron and description of Π mode applications)	Lecture	Assignment 4
Day19	Traveling Wave Tube(TWT)	Lecture	
Day20	Matrix Description of Microwave Circuits	Lecture	
Day21	Scattering Matrix: properties	Lecture	
Day22	Measurement of scattering coefficients	Lecture	
Day23	Scattering matrices for common microwave systems	Lecture	Assignment 5
Day24	Microwave Components	Lecture	
Day25	Waveguide tees-E-plane	Lecture	

Day26	H-plane	Lecture	
Day27	Magic tee	Lecture	Assignment 6
Day28	Rat race	Lecture	
Day29	Directional coupler	Lecture	Assignment 7
Day30	Tuning screws and stubs	Lecture	
Day31	Isolators and circulators – their constructional features and applications	Lecture	
Day32	Microwave filters	Lecture	
Day33	Phase shifters	Lecture	
Day34	Attenuators	Lecture	
Day35	Frequency meter	Lecture	Assignment 8
Day36	Solid State Microwave Devices	Lecture	
Day37	Transferred Electron Devices	Lecture	
Day38	Gunn Effect	Lecture	
Day39	Negative differential resistance phenomenon	Lecture	
Day40	Field domain formation	Lecture	
Day41	Gunn diode structure	Lecture	
Day42	Avalanche transit time devices	Lecture	
Day43	IMPATT	Lecture	Assignment 9
Day44	TRAPATT	Lecture	
Day45	BARITT diodes	Lecture	
Day46	Parametric amplifiers	Lecture	

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Subject : Transducer & Its Applications (ECE-420N)

Objective of Course :

Understanding the structural and functional principles of sensors and transducers used for various physical and non electrical quantities and how to use them to measure these quantities.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Definition of Transducer	Lecture	
Day 2	Advantages of an Electrical Signal as Output	Lecture	
Day 3	Basic Requirements of Transducers	Lecture	
Day 4	Primary and Secondary Transducer	Lecture	Assignment 1
Day 5	Analog or Digital Types of Transducers	Lecture	
Day 6	Resistive	Lecture	
Day 7	Inductive	Lecture	
Day 8	Capacitive	Lecture	
Day 9	Piezoelectric	Lecture	
Day10	Photoelectric	Lecture	
Day11	Hall Effect Transducers	Lecture	
Day12	Measurement of Pressure	Lecture	
Day13	Manometers	Lecture	Assignment 2
Day14	Force Summing Devices	Lecture	
Day15	Electrical Transducers	Lecture	
Day16	Measurement of Temperature	Lecture	
Day17	Metallic Resistance Thermometers	Lecture	
Day18	Semi Conductor Resistance Sensors	Lecture	
Day19	Thermistors	Lecture	
Day20	Thermoelectric Sensors	Lecture	
Day21	Pyrometers	Lecture	
Day22	Measurement of Displacement	Lecture	
Day23	Potentiometric Resistance Type Transducers	Lecture	Assignment 3
Day24	Inductive Type Transducers	Lecture	
Day25	Differential Transformer (LVDT)	Lecture	
Day26	Capacitive Transducers	Lecture	
Day27	Hall Effect Devices	Lecture	
Day28	Strain Gauge Transducers	Lecture	
Day29	Measurement of Velocity	Lecture	
Day30	Variable Reluctance Pick Up	Lecture	
Day31	Electromagnetic Tachometers	Lecture	
Day32	Photoelectric Tachometer	Lecture	
Day33	Toothed Rotor Tachometer Generator	Lecture	
Day34	Measurement of Force	Lecture	
Day35	Strain Gauge Load Cells	Lecture	Assignment 4
Day36	Pneumatic Load Cell	Lecture	
Day37	LVDT Type Force Transducer	Lecture	

Day38	Measurement of Torque	Lecture	
Day39	Torque Meter	Lecture	
Day40	Torsion Meter	Lecture	
Day41	Absorption Dynamometers	Lecture	
Day42	Inductive Torque Transducer	Lecture	
Day43	Digital Methods	Lecture	Assignment 5

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Lesson Plan of Electronics & Comm. Engineering Deptt. 8th Semester

Subject : Radar Engineering (ECE-422N)

Objective of Course :

To familiarize the students with the concepts of radar, various types of radar, radar mixer and various other technologies.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Radar Basics	Lecture	
Day 2	Radar Block Diagram & operation	Lecture	
Day 3	Application of Radar	Lecture	
Day 4	Simple form of Radar Equation	Lecture	Assignment 1
Day 5	Minimum Detectable Signal	Lecture	
Day 6	Receiver Noise	Lecture	
Day 7	Signal to Noise Ratio	Lecture	
Day 8	Transmitter Power	Lecture	Assignment 2
Day 9	Pulse Repetition Frequency	Lecture	
Day10	Range Ambiguities	Lecture	
Day11	System Losses	Lecture	
Day12	Propagation effects	Lecture	
Day13	CW & Frequency Modulated Radar	Lecture	
Day14	The Doppler Effect	Lecture	
Day15	CW Radar	Lecture	
Day16	FM- CW Radar	Lecture	
Day17	Multiple Frequency CW Radar	Lecture	
Day18	Introduction to MTI	Lecture	Assignment 3
Day19	Pulse Doppler Radar	Lecture	
Day20	Delay Line Cancellers, Multiple or Staggered	Lecture	
Day21	Pulse Repetition frequencies	Lecture	
Day22	Range-Gated Doppler Filters	Lecture	
Day23	MTI Delay Line	Lecture	
Day24	Limitation of MTI performance	Lecture	
Day25	Noncoherent MTI Pulse, Doppler Radar	Lecture	
Day26	MTI from a moving platform	Lecture	
Day27	Tracking with Radar	Lecture	Assignment 4
Day28	Sequential Lobbing	Lecture	
Day29	Conical Scan	Lecture	
Day30	Monopulse Tracking Radar	Lecture	
Day31	Tracking in range	Lecture	
Day32	Acquisition	Lecture	
Day33	Introduction to Receivers, Displays & Duplexers	Lecture	
Day34	Radar Receivers	Lecture	
Day35	Noise Figure	Lecture	Assignment 5
Day36	Mixer	Lecture	
Day37	Low-Noise Front Ends	Lecture	
Day38	Displays	Lecture	

Day39	Duplexer	Lecture	
Day40	Receiver Protectors	Lecture	

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