Haryana Engineering College, Jagadhri
Lesson Plan of M. Tech. Electronics & Comm. Engineering Deptt.
2nd Semester

Subject : Antennas and Radiating Systems (MTEC-102A)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Types of Antennas	Lecture	
Day 2	Wire antennas	Lecture	
Day 3	Aperture antennas	Lecture	
Day 4	Micro strip antennas	Lecture	
Day 5	Array antennas	Lecture	
Day 6	Reflector antennas	Lecture	
Day 7	Lens antennas	Lecture	
Day 8	Radiation Mechanism	Lecture	Assignment 1
Day 9	Current distribution on thin wire antenna	Lecture	
Day10	Fundamental Parameters of Antennas	Lecture	
Day11	Radiation Pattern, Radiation Power Density	Lecture	
Day12	Radiation Intensity	Lecture	
Day13	Directivity, Gain	Lecture	
Day14	Antenna efficiency	Lecture	
Day15	Beam efficiency	Lecture	
Day16	Bandwidth, Polarization	Lecture	
Day17	Input Impedance, radiation efficiency	Lecture	
Day18	Antenna Vector effective length	Lecture	Assignment 2
Day19	Friis Transmission equation	Lecture	
Day20	Antenna Temperature	Lecture	
Day21	Linear Wire Antennas	Lecture	
Day22	Infinitesimal dipole, Small dipole	Lecture	
Day23	Region separation	Lecture	
Day24	Finite length dipole	Lecture	
Day25	Half wave dipole	Lecture	
Day26	Ground effects	Lecture	
Day27	Loop Antennas: Small Circular loop	Lecture	Assignment 3
Day28	Circular Loop of constant current	Lecture	
Day29	Circular loop with non-uniform current	Lecture	
Day30	LinearArrays: Two element array	Lecture	
Day31	N Element array: Uniform Amplitude and spacing	Lecture	
Day32	Broadside and End fire array	Lecture	
Day33	Super directivity	Lecture	
Day34	Planar array, Design consideration	Lecture	
Day35	Aperture Antennas	Lecture	Assignment 4
Day36	Huygen's Field Equivalence principle, radiation equations	Lecture	

Day37	Rectangular Aperture	Lecture	
Day38	Circular Aperture	Lecture	
Day39	Horn Antennas, E-Plane, H-plane	Lecture	
Day40	Sectoral horns	Lecture	
Day41	Pyramidal and Conical horns	Lecture	
Day42	Reflector Antennas, Plane reflector, parabolic reflector	Lecture	
Day43	Casse grain reflectors	Lecture	Assignment 5
Day44	Introduction to MIMO.	Lecture	
Day45	Micro strip Antennas	Lecture	
Day46	Basic Characteristics, Feeding mechanisms	Lecture	
Day47	Method of analysis	Lecture	
Day48	Rectangular Patch, Circular Patch	Lecture	

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Lesson Plan of M. Tech. Electronics & Comm. Engineering Deptt.

2nd Semester

Subject : Advanced Digital Signal Processing (MTEC-104A)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Review of Filter concepts	Lecture	
Day 2	Review of design techniques	Lecture	
Day 3	Structures for FIR	Lecture	
Day 4	IIR filters	Lecture	
Day 5	Representation of numbers	Lecture	
Day 6	Quantization of filter coefficients	Lecture	
Day 7	Round-off effects in digital filters	Lecture	
Day 8	Multirate Digital Signal Processing	Lecture	Assignment 1
Day 9	Introduction	Lecture	
Day10	Decimation by a factor D	Lecture	
Day11	Interpolation by a factor I	Lecture	
Day12	Sampling rate conversion by rational factor I/D	Lecture	
Day13	Implementation of sampling rate conversion	Lecture	
Day14	Multistage implementation of sampling rate conversion	Lecture	
Day15	Multistage implementation of sampling rate conversion	Lecture	
Day16	Sampling rate conversion of band pass signals	Lecture	
Day17	Sampling rate conversion by an arbitrary factor	Lecture	
Day18	Sampling rate conversion by an arbitrary factor	Lecture	Assignment 2
Day19	Application of Multirate signal processing	Lecture	
Day20	Digital filter bank	Lecture	
Day21	Digital filter bank	Lecture	
Day22	Two-channel quadrature	Lecture	
Day23	Mirror filter bank	Lecture	
Day24	M-channel QMF bank	Lecture	
Day25	Wavelet Transform	Lecture	
Day26	Introduction to wavelet transform	Lecture	
Day27	Short Time Fourier Transform (STFT)	Lecture	Assignment 3
Day28	Short Time Fourier Transform (STFT)	Lecture	
Day29	Wavelet transform	Lecture	
Day30	Haar wavelet	Lecture	
Day31	Multirate resolution analysis	Lecture	
Day32	Daubechies wavelet	Lecture	
Day33	Some other standard wavelets	Lecture	
Day34	Applications of wavelet transform	Lecture	

Day35	Power Spectrum Estimation	Lecture	Assignment 4
Day36	Estimation of spectra from finite-duration observation of signals	Lecture	
Day37	Non-parametric methods for power spectrum estimation	Lecture	
Day38	Parametric methods for power spectrum estimation	Lecture	
Day39	Filter bank methods	Lecture	
Day40	Eigen analysis algorithms for spectrum estimation	Lecture	

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Lesson Plan of M. Tech. Electronics & Comm. Engineering Deptt.

2nd Semester

Subject : Satellite Communication (MTEC-106A)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Architecture of Satellite Communication System	Lecture	
Day 2	Principles and architecture of satellite Communication	Lecture	
Day 3	Brief history of Satellite systems	Lecture	
Day 4	Advantages, disadvantages, applications	Lecture	
Day 5	Frequency bands used for satellite communication	Lecture	
Day 6	Their advantages/drawbacks	Lecture	
Day 7	Orbital Analysis	Lecture	
Day 8	Orbital equations	Lecture	Assignment 1
Day 9	Kepler's laws of planetary motion	Lecture	
Day10	Apogee and Perigee for an elliptical orbit	Lecture	
Day11	Evaluation of velocity	Lecture	
Day12	Orbital period	Lecture	
Day13	Angular velocity etc of a satellite	Lecture	
Day14	Concepts of Solar day and Sidereal day	Lecture	
Day15	Satellite sub-systems	Lecture	
Day16	Architecture and Roles of various sub-systems of a satellite system such as Telemetry	Lecture	
Day17	Tracking Command and monitoring (TTC & M)	Lecture	
Day18	Attitude and orbit control system (AOCS)	Lecture	Assignment 2
Day19	Communication sub-system	Lecture	
Day20	Power sub-systems	Lecture	
Day21	Antenna sub-system	Lecture	
Day22	Typical Phenomena in Satellite Communication	Lecture	
Day23	Solar Eclipse on satellite	Lecture	
Day24	Its effects	Lecture	
Day25	Remedies for Eclipse	Lecture	
Day26	Sun Transit Outage phenomena, its effects and remedies	Lecture	
Day27	Doppler frequency shift phenomena	Lecture	Assignment 3
Day28	Expression for Doppler shift	Lecture	
Day29	Satellite link budget: Flux density	Lecture	
Day30	Received signal power equations	Lecture	
Day31	Calculation of System noise temperature for satellite receiver	Lecture	

Day32	Noise power calculation	Lecture	
Day33	Drafting of satellite link budget and C/N ratio calculations in clear air and rainy conditions	Lecture	
Day34	Case study of Personal Communication system (satellite telephony) using LEO	Lecture	
Day35	Modulation	Lecture	Assignment 4
Day36	Multiple Access Schemes used in satellite communication	Lecture	
Day37	Typical case studies of VSAT	Lecture	
Day38	DBS-TV satellites	Lecture	
Day39	Few recent communication satellites launched by NASA/ ISRO	Lecture	
Day40	GPS	Lecture	

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Lesson Plan of M. Tech. Electronics & Comm. Engineering Deptt.

2nd Semester

Subject : Programmable Networks – SDN, NFV (MTEC-116A)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Introduction to Programmable Networks	Lecture	
Day 2	History and Evolution of Software Defined Networking (SDN)	Lecture	
Day 3	Fundamental Characteristics of SDN	Lecture	
Day 4	Separation of Control Plane	Lecture	
Day 5	Data Plane	Lecture	
Day 6	Active Networking	Lecture	
Day 7	Control and Data Plane Separation: Concepts	Lecture	
Day 8	Advantages	Lecture	Assignment 1
Day 9	Disadvantages	Lecture	
Day10	The basics of Open Flow protocol	Lecture	
Day11	Network Virtualization: Concepts	Lecture	
Day12	Applications	Lecture	
Day13	Existing Network Virtualization Framework	Lecture	
Day14	Mininet A simulation environment for SDN	Lecture	
Day15	Control Plane: Overview	Lecture	
Day16	Existing SDN Controllers including Floodlight	Lecture	
Day17	Open Day light projects	Lecture	
Day18	Customization of Control Plane	Lecture	Assignment 2
Day19	Switching	Lecture	
Day20	Firewall Implementation using SDN Concepts	Lecture	
Day21	Data Plane	Lecture	
Day22	Software-based	Lecture	
Day23	Hardware-based	Lecture	
Day24	Programmable Network Hardware	Lecture	
Day25	Programming SDNs	Lecture	
Day26	Northbound Application Programming Interface	Lecture	
Day27	Current Languages and Tools	Lecture	Assignment 3
Day28	Composition of SDNs	Lecture	
Day29	Network Functions Virtualization (NFV)	Lecture	
Day30	Software Defined Networks: Concepts	Lecture	
Day31	Implementation	Lecture	
Day32	Applications	Lecture	
Day33	Data Center Networks: Packet	Lecture	

Day34	Optical and Wireless Architectures	Lecture	
Day35	Network Topologies	Lecture	Assignment 4
Day36	Use Cases of SDNs: Data Centers	Lecture	
Day37	Internet Exchange Points	Lecture	
Day38	Backbone Networks	Lecture	
Day39	Home Networks	Lecture	
Day40	Traffic Engineering	Lecture	

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