Haryana Engineering College, Jagadhri

Lesson Plan of Electrical Engineering Deptt. 4th Semester

Subject : Digital Electronics (EE-202A)

Objective of Course :

1. Understand working of logic families and logic gates.
2. Design and implement Combinational and Sequential logic circuits.
3. Understand the process of Analog to Digital conversion and Digital to Analog conversion.
4. Be able to use PLDs to implement the given logical problem.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Fundamentals of Digital Techniques	Lecture	
Day 2	Digital signal	Lecture	
Day 3	Review of number systems	Lecture	
Day 4	Binary codes, BCD	Lecture	
Day 5	Excess-3, Gray	Lecture	
Day 6	EBCDIC, ASCII	Lecture	
Day 7	Logic gates- AND, OR, NOT	Lecture	
Day 8	NAND, NOR, EX-OR	Lecture	Assignment 1
Day 9	Boolean algebra	Lecture	
Day10	Error detection and correction, hamming code	Lecture	
Day11	Combination Design using Gates	Lecture	
Day12	Design using gates	Lecture	
Day13	K- map	Lecture	
Day14	Problems of K- map	Lecture	
Day15	Problems of K- map	Lecture	
Day16	Quine-Mccluskey methods of simplification	Lecture	
Day17	Combinational design using MSI Devices	Lecture	
Day18	Multiplexers	Lecture	Assignment 2
Day19	Demultiplexers and their uses as logic elements	Lecture	
Day20	Decoders	Lecture	
Day21	Adders	Lecture	
Day22	Subtracters	Lecture	
Day23	BCD arithmetic circuits	Lecture	
Day24	Encoders	Lecture	
Day25	Decoders	Lecture	
Day26	Drivers for display devices	Lecture	
Day27	Design of Sequential circuits	Lecture	Assignment 3
Day28	Flip flops: S-R, J-K,	Lecture	
Day29	T,D, master slave, Edge triggered	Lecture	
Day30	Shift registers, Sequence generators	Lecture	
Day31	Counters- asynchronous and synchronous	Lecture	
Day32	Ring counters	Lecture	
Day33	Johnson Counter	Lecture	

Day34	D/A &A/D Converters	Lecture	
Day35	D/A converters- weighted resistor	Lecture	Assignment 4
Day36	R-2 R ladder, Specifications for D/A converters	Lecture	
Day37	A/D converters: Sample and hold circuits	Lecture	
Day38	Quantization, Parallel-comparator	Lecture	
Day39	Successive approximation, counting type, Dual slope ADC.	Lecture	
Day40	Digital logic families	Lecture	
Day41	Bipolar logic families: RTL, DTL	Lecture	
Day42	DCTL, HTL, TTL	Lecture	
Day43	ECL, MOS, CMOS logic families	Lecture	Assignment 5
Day44	Tristate logic, interfacing of CMOS	Lecture	
Day45	TTL families	Lecture	
Day46	Programmable logic devices	Lecture	
Day47	ROM, PLA, PAL	Lecture	
Day48	FPGA and CPLDS	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of Electrical Engineering Deptt. 4th Semester

Subject : Signal & Systems (EE-204A)

Objective of Course :

1. Understand the concepts of continuous time and discrete time systems.
2. Analyse systems in complex frequency domain.
3. Understand sampling theorem and its implications.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Introduction to Signals	Lecture	
Day 2	Continuous and discrete time signals	Lecture	
Day 3	Deterministic and stochastic signals	Lecture	
Day 4	Periodic and aperiodic signals, even and odd signals	Lecture	Assignment 1
Day 5	Energy and power signals	Lecture	
Day 6	Exponential and sinusoidal signals and singular functions	Lecture	
Day 7	Signal representation in terms of singular functions,	Lecture	
Day 8	Introduction to Systems	Lecture	Assignment 2
Day 9	Linear and non-linear systems	Lecture	
Day10	Time invariant and time varying systems	Lecture	
Day11	Lumped and distributed systems	Lecture	
Day12	Deterministic and stochastic systems	Lecture	
Day13	Casual and non-causal systems	Lecture	Assignment 3
Day14	Analog and discrete/digital memory and memory less systems	Lecture	
Day15	Random Variables	Lecture	
Day16	Introduction to Random Variables	Lecture	
Day17	PDF, CDF	Lecture	
Day18	Linear Time Invariant Systems	Lecture	Assignment 4
Day19	Introduction to linear time invariant (LTI) systems	Lecture	
Day20	Properties of LTI systems	Lecture	
Day21	Convolution integral, convolution sum	Lecture	
Day22	Causal LTI systems described by differential and difference equations	Lecture	
Day23	Concept of impulse response	Lecture	Assignment 5
Day24	Discretization of Analog Signals	Lecture	
Day25	Introduction to sampling	Lecture	
Day26	Sampling theorem and its proof	Lecture	
Day27	Effect of under sampling	Lecture	Assignment 6
Day28	Reconstruction of a signal from sampled signal.	Lecture	
Day29	Fourier Series	Lecture	Assignment 7

Day30	Continuous time Fourier series (CTFS)	Lecture	
Day31	Properties of CTFS	Lecture	
Day32	Convergence of Fourier series	Lecture	
Day33	Fourier Transform	Lecture	
Day34	Continuous Time Fourier Transform (CTFT)	Lecture	
Day35	Properties of CTFT	Lecture	Assignment 8
Day36	Systems characterized by linear constant- coefficient differential equations	Lecture	
Day37	Discrete time Fourier transform (DTFT)	Lecture	
Day38	Properties of DTFT	Lecture	
Day39	Duality	Lecture	
Day40	Systems characterized by linear constant coefficient difference equations	Lecture	
Day41	Laplace Transform	Lecture	
Day42	Introduction to Laplace transform	Lecture	
Day43	Region of convergence for laplace transform	Lecture	Assignment 9
Day44	Inverse Laplace transform	Lecture	
Day45	Properties of Laplace transform	Lecture	
Day46	Analysis and characterization of LTI systems using LaplaceTransform	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of Electrical Engineering Deptt. 4th Semester

Subject : Electrical Machines - II (EE-206A)

Objective of Course :

To familiarize the students with the basics of Electrical Machines.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Induction Machines	Lecture	
Day 2	Basic concept of Induction machines	Lecture	
Day 3	Winding factors	Lecture	
Day 4	Generated e.m.f. and m.m.f distribution	Lecture	Assignment 1
Day 5	AC winding	Lecture	
Day 6	Rotating magnetic field	Lecture	
Day 7	3-phase Induction Motor	Lecture	
Day 8	Construction, features	Lecture	
Day 9	Production of torque, phasor diagram	Lecture	
Day10	Equivalent circuit	Lecture	
Day11	Performance analysis	Lecture	
Day12	Torque –slip characteristics	Lecture	
Day13	Running, light and blocked rotor test	Lecture	Assignment 2
Day14	Load test on 3-ph I.M.	Lecture	
Day15	Single phase induction motors	Lecture	
Day16	Constructional features & double revolving field theory	Lecture	
Day17	Equivalent circuit	Lecture	
Day18	Determination of parameters	Lecture	
Day19	Split phase	Lecture	
Day20	Starting methods	Lecture	
Day21	Types& applications	Lecture	
Day22	Starting of 3-ph I.M.	Lecture	
Day23	Starting methods of squirrel cage	Lecture	Assignment 3
Day24	Wound rotor induction motor	Lecture	
Day25	Induction Generator	Lecture	
Day26	Operation	Lecture	
Day27	Applications, advantages.	Lecture	
Day28	Three Phase Synchronous Generators	Lecture	
Day29	Principle, construction	Lecture	
Day30	EMF equation, armature winding	Lecture	
Day31	Armature reaction, equivalent circuit	Lecture	
Day32	Voltage regulation – synchronous reactance method	Lecture	
Day33	Rothert'sm.m.f method	Lecture	
Day34	Potier triangle method	Lecture	

Day35	Output power equation, power angle curve	Lecture	Assignment 4
Day36	Two reactance theory, slip test	Lecture	
Day37	Transient and subtransient reactance	Lecture	
Day38	Synchronization, parallel operation	Lecture	
Day39	Three Phase Synchronous Motor	Lecture	
Day40	Construction, Principle of operation	Lecture	
Day41	Equivalent circuit, torque, power developed, starting	Lecture	
Day42	V-curve	Lecture	
Day43	Hunting-causes , effects & reduction	Lecture	Assignment 5
Day44	Synchronous condenser applications	Lecture	
Day45	Comparison between induction motor and synchronous motor	Lecture	
Day46	High tarting torque motors	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of Electrical Engineering Deptt. 4th Semester

Subject : Power Electronics (EE-208A)

Objective of Course :

To familiarize the students with the Converter and Power switching device.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Power switching devices	Lecture	
Day 2	Diode	Lecture	
Day 3	Thyristor	Lecture	
Day 4	MOSFET	Lecture	Assignment 1
Day 5	IGBT	Lecture	
Day 6	I-V Characteristics	Lecture	
Day 7	Firing circuit for thyristor	Lecture	
Day 8	Voltage and current commutation of a thyristor	Lecture	Assignment 2
Day 9	Gate drive circuits for MOSFET and IGBT	Lecture	
Day10	Thyristor rectifiers	Lecture	
Day11	Single-phase half-wave and full-wave rectifiers	Lecture	
Day12	Single-phase full-bridge thyristor rectifier with Rload	Lecture	
Day13	Highly inductive load	Lecture	
Day14	Three-phase full-bridge thyristor rectifier with R-load and	Lecture	
Day15	Highly inductive load	Lecture	
Day16	Input current wave shape and power factor.	Lecture	
Day17	DC-DC buck converter	Lecture	
Day18	Elementary chopper with an active switch and diode	Lecture	Assignment 3
Day19	Concepts of duty ratio	Lecture	
Day20	Average voltage	Lecture	
Day21	Power circuit of a buck converter	Lecture	
Day22	Analysis and waveforms at steady state	Lecture	
Day23	Duty ratio control of output voltage	Lecture	
Day24	DC-DC boost converter	Lecture	
Day25	Power circuit of a boost converter	Lecture	
Day26	Analysis and waveforms at steady state	Lecture	
Day27	Relation between duty ratio and average output voltage.	Lecture	Assignment 4
Day28	Single-phase voltage source	Lecture	
Day29	Power circuit of single-phase voltage source inverter	Lecture	
Day30	Switch states	Lecture	
Day31	Instantaneous output voltage	Lecture	

Day32	Square wave operation of the inverter	Lecture	
Day33	Concept of average voltage over a switching cycle	Lecture	
Day34	Bipolar sinusoidal modulation	Lecture	
Day35	Unipolar sinusoidal modulation	Lecture	Assignment 5
Day36	Modulation index and output voltage	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of Electrical Engineering Deptt. 4th Semester

Subject : Electromagnetic Fields (EE-216A)

Objective of Course :

1. To understand the basic laws of electromagnetism.
2. To obtain the electric and magnetic fields for simple configurations under static conditions.
3. To analyse time varying electric and magnetic fields.
4. To understand Maxwell's equation in different forms and different media.
5. To understand the propagation of EM waves.

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Review of Vector Calculus	Lecture	
Day 2	Vector algebra-addition, subtraction	Lecture	
Day 3	Components of vectors	Lecture	
Day 4	Scalar and vector multiplications	Lecture	Assignment 1
Day 5	Triple products	Lecture	
Day 6	Three orthogonal coordinate systems (rectangular, cylindrical and spherical)	Lecture	
Day 7	Vector calculus- differentiation	Lecture	
Day 8	Partial differentiation	Lecture	Assignment 2
Day 9	Integration	Lecture	
Day10	Gradient, divergence and curl	Lecture	
Day11	Integral theorems of vectors.	Lecture	
Day12	Conversion of a vector from one coordinate system to another.	Lecture	
Day13	Static Electric Field	Lecture	Assignment 3
Day14	Coulomb's law	Lecture	
Day15	Electric field intensity	Lecture	
Day16	Electrical field due to point charges	Lecture	
Day17	Line, Surface and Volume charge distributions	Lecture	
Day18	Gauss law and its applications	Lecture	Assignment 4
Day19	Absolute Electric potential	Lecture	
Day20	Potential difference	Lecture	
Day21	Calculation of potential differences for different configurations	Lecture	
Day22	Electric dipole	Lecture	
Day23	Electrostatic Energy and Energy density.	Lecture	Assignment 5
Day24	Conductors, Dielectrics and Capacitance	Lecture	
Day25	Current and current density	Lecture	
Day26	Ohms Law in Point form	Lecture	
Day27	Continuity of current	Lecture	Assignment 6
Day28	Boundary conditions of perfect dielectric materials	Lecture	
Day29	Permittivity of dielectric materials	Lecture	Assignment 7

Day30	Capacitance, Capacitance of a two wire line	Lecture	
Day31	Poisson's equation	Lecture	
Day32	Laplace's equation	Lecture	
Day33	Solution of Laplace and Poisson's equation	Lecture	
Day34	Application of Laplace's and Poisson's equations	Lecture	
Day35	Static Magnetic Fields and Maxwell's Equations	Lecture	Assignment 8
Day36	Biot-Savart Law	Lecture	
Day37	Ampere Law	Lecture	
Day38	Magnetic flux and magnetic flux density	Lecture	
Day39	Scalar and Vector Magnetic potentials	Lecture	
Day40	Steady magnetic fields produced by current carrying conductors	Lecture	
Day41	Nature of magnetic materials	Lecture	
Day42	Magnetization and permeability	Lecture	
Day43	Magnetic boundary conditions	Lecture	Assignment 9
Day44	Maxwell's equations in differential and integral forms and their physical significances in circuit and field theory	Lecture	

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