Lesson Plan

Name of the Faculty : **RAJIV SANDHU**

Discipline : **Electrical Engineering**

Semester : **3rd Semester**

Subject : **FUNDAMENTALS OF ELECTRICAL ENGINEERING**

Lesson Plan Duration : **15-16 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1	Application and Advantages of Electrical Energy *Different forms of energy *Advantages of electrical energy *Uses of electrical energy	1	To verify that $R_t = R_1 + R_2 + \ldots$ Rnwhere R_1, R_2Rnetc. are resistances connected in series
	2	Basic concept of charge, current, voltage	2	To verify $\frac{1}{Rt} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots\ldots + \frac{1}{R_n}$ Where R_1, R_2 etc. are resistances connected in parallel
	3	Resistance, power, energy and their units	3	Verification of Kirchhoff's current and voltage laws applied to DC circuits a) to construct a circuit arrangement consisting of resistances in series, parallel combination b) identification of node points in the circuit
	4	Conversion of units of work, power and energy from one form to another	4,5	*to see that algebraic sum of currents at node point is zero *to see that algebraic sum of emfs and voltage drops in a closed loop is zero
	5	Ohm's law, resistances in series and parallel	6	To construct an RL and RC circuit and to measure a) their impedance b) phase angle between voltage and current c) construct impedance triangle
	6	Kirchhoff's laws and their applications in solving electrical network problems	7	Measurement of power and power factor of a single phase RLC circuit. To calculate kVA and kVAR
	7	Network theorems such as Thevenin's theorem, superposition theorem Maximum power transfer theorem and Norton's theorem	8	Testing a battery for its charged condition and to charge it
	8	Star-delta transformation		

	9	Basic idea about primary and secondary cells		
	10 to 12	Working principle, construction and applications of Lead acid, Nickel Cadmium and Silver Oxide Cells		
	13	Charging methods used for lead acid accumulator		
	14	Care and maintenance of a lead acid battery		
	15	Grouping of cells in series and parallel (simple numerical problems)		
	16	Introduction to electromagnetism		
	17	Magnetic field around a straight current		
	18	Carrying conductor and a solenoid		
	19, 20	Methods to find its direction, force between two parallel current carrying conductors.		
	21	Force on a conductor placed in the magnetic field		
	22	Series magnetic circuits, simple problems		
	23	Concept of hysteresis, loop and hysteresis loss		
	24	Faraday's Laws of electromagnetic induction		
	25	Lenz's law, Fleming's Right and Left Hand Rule		
	26	Principle of self and mutual induction, Principle of self and mutually induced e.m.f. and simple problems		
	27	Inductances in series and parallel, Energy stored in a magnetic field		
	28	Concept of eddy currents		
	29	Eddy current loss		
	30	Concept of A.C. generation (single phase and three phase)		
	31	Difference between A.C and D.C		
	32	Alternating current and		

		voltage, equation		
	33	R.M.S value, form factor, power factor etc		
	34	Concept of phase and phase difference		
	35	Representation of alternating sinusoidal quantities by vectors		
	36	AC through pure resistance, inductance and capacitance		
	37, 38	Alternating voltage applied to RL,RC and RLC series and parallel circuits (impedance triangle, phasor diagram and their solutions)		
	39	Introduction to susceptance, conductance and admittance		
	40	Power in pure resistance, inductance, capacitance, RL, RC, RLC circuits		
	41	Active and reactive components of current and their significance		
	42	Power factor and its practical significance		
	43	Advantages of 3Ø over 1-Ø system		
	44	Star & delta connections (derive relationship b/w phase Voltage(Vph)		
	45	Line Voltage (VL) and Phase Currrent (Iph) Line Current (I L) in star delta connections		
	46	3-phase balanced and unbalanced circuits		
	47	Power in 3-phase circuits		

Lesson Plan

Name of the Faculty : **Ms. Ruby**

Discipline : **Electrical Engineering**

Semester : **3rd Semester**

Subject : **ELECTRICAL AND ELECTRONICS ENGINEERING MATERIALS**

Lesson Plan Duration : **15-16 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1	Classification of materials into conducting		
	2	Semi conducting		
	3	Insulating materials through a brief reference to their atomic structure and energy bands		
	4	Introduction and Resistance and factors affecting it		
	5	Classification of conducting material as low resistivity and high resistivity materials, low resistance materials		
	6	Copper		
	7	General properties as conductor: Resistivity		
	8	Aluminium, General properties as conductor		
	9	Mechanical properties of hard and annealed aluminium		
	10	Solderability, contact resistance		
	11	Applications in the field of electrical engineering.		
	12	Steel: Mechanical properties of steel		
	13	Applications in the field of electrical engineering.		
	14	Introduction to bundle conductors and its applications		
	15	Low resistivity copper alloys		
	16	Brass, Bronze (cadmium and Beryllium), their practical applications with reasons for the same		
	17	Applications of special metals e.g. Silver		
	18	Applications of special metals e.g. Gold, Platinum etc		
	19	High resistivity materials		
	20	Manganin, constantan		

	21	Nichrome, mercury		
	22	Platinum, carbon and tungsten		
	23	Semi-conductors and their properties		
	24	Resistors, capacitors, diodes, transistors and inductors		
	25	Electrical Properties:Volume resistivity, surface resistance		
	26	Dielectric loss, dielectric strength (breakdown voltage) dielectric constant		
	27	Physical Properties: Hygroscopicity, tensile and compressive strength		
	28	Abrasive resistance, brittleness		
	29	Thermal Properties: Heat resistance, classification according to permissible temperature rise		
	30	Effect of overloading on the life of an electrical appliance		
	31	Thermal conductivity		
	32	Electro-thermal breakdown in solid dielectrics		
	33	Chemical Properties:Solubility, chemical resistance,weatherability		
	34	Mechanical properties, mechanical structure, tensile structure		
	35	Definition and classification Thermosetting materials		
	36	Phenol-formaldehyde resins (i.e. Bakelite) amino resins (urea formaldehyde and Melamine-formaldehyde)		
	37	Thermo-plastic materials: Polyvinyl chloride (PVC), polyethelene, silicones, their important properties and applications		
	38	Natural insulating materials, properties and their applications Mica and Mica products, Asbestos and asbestos products Ceramic materials (porcelain and steatite)		
	39	Glass and glass products, Cotton Silk Jute		
	40	Paper (dry and impregnated) Rubber, Bitumen Mineral and insulating oil for transformers switchgear capacitors,		

		high voltage insulated cables, insulating varnishes for coating and impregnation		
	41	Enamels for winding wires, Glass fibre sleeves		
	42	Gaseous materials; Air, Hydrogen, Nitrogen, SF their properties and applications		
	43	Introduction - ferromagnetic materials, permeability		
	44	Hysteresis loop including coercive force and residual magnetism, concept of eddy current and hysteresis loss		
	45	Curie temperature, magnetostriction effect.		
	46	Alloyed steels with silicon: High silicon		
	47	Alloy steel for transformers		
	48	Electric rotating machines		
	49	Cold rolled grain oriented steels for transformer		
	50	Non-oriented steels for rotating machine		
	51	Nickel-iron alloys, Soft Ferrites		
	52	Hard magnetic materials Tungsten steel, chrome steel		
	53	Hard ferrites and cobalt steel, their applications		
	54	Special Materials Thermocouple, bimetals		
	55	Leads soldering and fuses material		
	56	Fuses materialand their applications		
	57	Introduction of various engineering materials necessary for fabrication of electrical machines		
	58	Motors, generators, transformers etc		

Lesson Plan

Name of the Faculty : **Mr. Manoj**

Discipline : **Electrical Engineering**

Semester : **3rdSemester**

Subject : **ELECTRONICS - II**

Lesson Plan Duration : **15-16 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1	Difference between voltage and power amplifier	1	To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a two stage RC coupled amplifier
	2, 3	Important terms in Power Amplifier, collector efficiency, distortion and dissipation capability	2	To measure (a) optimum load (b) output power (c) signal handling capacity of a push-pull amplifier
	4, 5, 6	Classification of power amplifier class A, B and C	3	To observe the effect of negative current feedback on the voltage gain of a single stage transistor amplifier by removing emitter bye-pass capacitor
	7	Class A single-ended power amplifier, its working and collector efficiency	4	To measure (a) voltage gain (b) input and output impedance for an emitter follower circuit
	8	Impedance matching in a power amplifier using transformer	5	To measure frequency generation in Hartley
	9	Heat sinks in power amplifiers	6	To measure frequency generation in R-C Phase Shift oscillator
	10	Push-pull amplifier: circuit details, working and advantages (no mathematical derivations)	7	To observe the differentiated and integrated square wave on a CRO for different values of R-C time constant
	11, 12	Principles of the working of complementary symmetry push-pull amplifier	8	Clipping of both portion of sine-wave using : diode and dc source
	13	Tuned Voltage Amplifier - Introduction	9	Clipping of both portion of sine-wave using : zener diodes
	14, 15	Series and parallel resonance (No mathematical derivation)	10	Clamping a sine-wave to : Negative dc voltage
	16, 17	Single and double tuned voltage amplifiers	11	Clamping a sine-wave to : Positive dc voltage
	18	Frequency response of tuned voltage amplifiers	12	To generate square-wave using an astablemultivibrator and to observe the wave form on a CRO and verify the result using p-spice software
	19, 20	Applications of tuned voltage amplifiers	13	To observe triggering and working of a bistablemultivibrator circuit and

				observe its output wave form on a CRO
	21, 22	Feedback and its importance, positive and negative feedback and their need	14	To use the op-Amp (IC 741) as inverting one and non-inverting amplifiers, adder, comparator, integrator and differentiator and verify the result using p-spice software
	23	Voltage gain of an amplifier with negative feedback $A = \frac{A}{1+\beta A}$	15	To study the pin configuration and working of IC 555 and its use as monostable and astablemultivibrator
	24	Effect of negative feedback on voltage gain, stability, distortion, band width, output and input impedance of an amplifier (No mathematical derivation)	16	To realize the regulated power supply by using three terminal voltage regulator ICs such as 7805, 7905, 7915 etc. and verify the result using p-spice software
	25, 26	Typical feedback circuits		
	27	Effect of removing the emitter by-pass capacitor on a CE transistor amplifier		
	28	Emitter follower and its applications		
	29	Sinusoidal Oscillators – positive feedback in amplifiers		
	30	Difference between an oscillator and an alternator		
	31	Essentials of an oscillator		
	32, 33, 34	Circuit details and working of LC oscillators viz. Tuned Collector, Hartley and Colpitt's oscillators		
	35	R-C oscillator circuits		
	36	phase shift and Wein bridge oscillator circuits		
	37	Introduction to piezoelectric crystal and crystal oscillator circuit		
	38, 39	Concept of Wave-shaping		
	40	R-C differentiating		
	41	integrating circuits		
	42, 43	Diode clipping circuits		
	44, 45	Diode clamping circuits		
	46	Applications of wave-shaping circuits		
	47	Transistor as a switch (explanation using CE transistor characteristics)		
	48	Collector coupled astablemultivibrator		
	49	monostablemultivibrator		
	50	bistablemonostable		
	51	Brief mention of uses of multivibrators		
	52, 53	Working and applications of transistor inverter circuit using power transistors		
	54, 55	Working Principles of different types of power supplies		
	56, 57	CVTs, IC voltage regulator (78 XX,79XX)		
	58	The basic operational amplifier		
	59	The differential amplifier		
	60	The emitter coupled differential		

		amplifier		
	61	Offset even voltages and currents		
	62	Basic operational amplifier applications, integrator and differentiator, summer, subtractor		
	63	Familiarization with specifications and pin configuration of IC 741		
	64	Block diagram and operation of 555 IC timer		

Lesson Plan

Name of the Faculty : **Ms. Ruby**

Discipline : **Electrical Engineering**

Semester : **3rd Semester**

Subject : **ESTIMATING AND COSTING IN ELECTRICAL ENGINEERING**

Lesson Plan Duration : **15-16 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1,2	Introduction Purpose of estimating and costing, proforma for making estimates, preparation of materials schedule, costing, price list		
	3,4,5	Preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electrical point method and fixed percentage method		
	6,7	Contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills.		
	8,9	Cleat, batten, casing capping and conduit wiring, comparison of different wiring systems		
	9,10	Selection and design of wiring schemes for particular situation (domestic and Industrial)		
	11 to 13	Selection of wires and cables, wiring accessories and use of protective devices i.e. MCB, ELCB etc. Use of wire-gauge and tables (to be prepared/arranged)		
	14 to 21	Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load)		
	22 to 28	Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-		

		phase, 3-phase motor load and the light load (3-phase supply system)		
	29 to 31	Service line connections estimate for domestic and industrial loads (over-head and under ground connections) from pole to energy meter.		
	32 to 37	Transmission and distribution lines (overhead and underground) planning and designing of lines with different fixtures, earthing etc. based on unit cost calculations		
	38 to 45	Substation: Types of substations, substation schemes and components, estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating, earthing of substations, Key Diagram of 66 kV/11 kV Substation		
	46 to 47	Single line diagram, layout sketching of outdoor, indoor 11kV sub-station or 33kV sub-station		
	48 to 59	At least 2-3 exercises, tender – constituents finalization, specimen tender		