DEPARTMENT OF ELECTRICAL ENGINEERING

COLLEGE OF TECHNOLOGY AND ENGINEERING

MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, UDAIPUR

FIRST YEAR B.TECH. (I SEMESTER)

LECTURE PLAN

Course No.: EE 100 (ESC)

Course Name: ELECTRICAL ENGINEERING Faculty: Mr. Sachin Yadav/ Mr. Sanjay Patel

Recommended Books:

S.No.	Title	Author
1.	Electrical Technology	B. L. Therja
2.	Network analysis	M.E.Van Valkenberg
3.	Introduction to Electrical Network Theory,	Soni and Gupta.
4.	Fundamentals of Electrical & Electronics.	J.B. Gupta. (2002)

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Electro motive force, reluctance,
2.	Lecture 2	laws of magnetic circuits
3.	Lecture 3	determination of ampere-turns for series and parallel magnetic circuits
4.	Lecture 4	hysteresis and eddy current losses
5.	Lecture 5	Kirchoff's law .
6.	Lecture 6	delta-star and star delta transformation .
7.	Lecture 7	source conversion;
8.	Lecture 8	network theorems: Thevenin's
9.	Lecture 9	Norton's, superposition
10.	Lecture 10	maximum power transfer.
11	Lecture 11	Single Phase A.C.Ciruits : Single Phase EMF generation
12	Lecture 12	average and effective values of sinusoidal
13	Lecture 13	linear periodic wave forms
14	Lecture 14	instantaneous and average power
15	Lecture 15	power factor, reactive & apparent power
16	Lecture 16	solution of R-L-C, series, parallel
17	Lecture 17	series-parallel circuits
18	Lecture 18	complex representation of impedances, phasor diagram
19	Lecture 19	series and parallel resonance
20	Lecture 20	Transformer: Faraday's laws of Electromagnetic induction
21	Lecture 21	construction and principle operation of single phase transformer
22	Lecture 22	EMF equation

23	Lecture 23	voltage and current relationship and Phasor diagram for ideal transformer
24	Lecture 24	Fundamentals of DC machines:
25	Lecture 25	Working principle,
26	Lecture 26	operation
27	Lecture 27	performance of DC machines (Motor and generator)
28	Lecture 28	performance of DC machines (Motor and generator)
29	Lecture 29	performance of DC machines (Motor and generator)
30	Lecture 30	Three phase A.C. circuits: Three phase EMF generation
31	Lecture 31	delta and star connection
32	Lecture 32	methods of three phase power measurement;
33	Lecture 33	power factor, reactive and apparent power
34	Lecture 34	Series and parallel resonance
35	Lecture 35	Concept of Three phases induction motor: construction and operation
36	Lecture 36	Concept of Three phases induction motor: construction and operation
37	Lecture 37	Basic introduction of single phase induction motor
38	Lecture 38	Basic introduction of single phase induction motor

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SECOND YEAR B.TECH. (III SEMESTER)

LECTURE PLAN

Course No.: EE 235(PCC)

Course Name: CIRCUIT THEORY – I Faculty: Dr. V. Dave

Recommended Books:

S.No.	**Title**	**Author**
1.	Network analysis	M.E.Van Valkenberg
2.	Introduction to Electrical Network Theory	Soni and Gupta

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Basic circuit element and waveform: circuit component
2.	Lecture 2	ideal and practical voltage sources and their inter conversion
3.	Lecture 3	ideal and practical current sources and their inter conversion
4.	Lecture 4	independent and dependent sources
5.	Lecture 5	unilateral and bilateral, active and passive parameters.
6.	Lecture 6	linear and non linear, distributed and lumped parameters.
7.	Lecture 7	parameters Network theorem for AC network: Mesh and Nodal analysis.
8.	Lecture 8	parameters Network theorem for AC network: thevenin and Norton.
9.	Lecture 9	parameters Network theorem for AC network: superposition.
10.	Lecture 10	maximum power transfer, milliman and telegen theorem.
11	Lecture 11	Compensation and reciprocity theorem.
12	Lecture 12	Resonance in series and parallel circuit.
13	Lecture 13	Q factor and selectivity.
14	Lecture 14	Transient and steady state response.
15	Lecture 15	solution of differential equation.
16	Lecture 16	Effect and determination of initial conditions .
17	Lecture 17	Effect and determination conditions of time constants.
18	Lecture 18	analysis of coupled circuit under sinusoidal excitation,

19	Lecture 19	coefficient of coupling.
20	Lecture 20	analysis of 3 phase balanced and unbalanced circuit
21	Lecture 21	measurement of 3 phase active and reactive power
22	Lecture 22	Two port Network: open circuit.
23	Lecture 23	Two port Network: Short circuit and transmission.
24	Lecture 24	Hybrid parameters and their inter- relationship.
25	Lecture 25	Hybrid parameters and their interconnection.
26	Lecture 26	Two port symmetry and Input Impedance,
27	Lecture 27	output impedance and Image Impedance.
28	Lecture 28	Image Impedance and Brune's test.
29	Lecture 29	Fourier series: Periodic function.
30	Lecture 30	Trigonometric Fourier series.
31	Lecture 31	Evaluation of Fourier coefficient
32	Lecture 32	Evaluation of Fourier coefficient
33	Lecture 33	waveform symmetry Analysis of simple circuit with non sinusoidal excitation
34	Lecture 34	waveform symmetry Analysis of simple circuit with non sinusoidal excitation
35	Lecture 35	waveform symmetry Analysis of simple circuit with non sinusoidal excitation

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SECOND YEAR B.TECH. (III SEMESTER)

LECTURE PLAN

Course No.: EE 236(PCC)

Course Name: ELECTRICAL MEASUREMENTS & INSTRUMENTS Faculty: Dr. J K Meherchandani

Recommended Books:

S.No.	**Title**	**Author**
1.	Electrical & Electronics Measurements & Instrumentation.	A.K. Sawhney
2.	Electronic Instrumentation	H.S. Kalsi
3.	Electrical Measurements	E.W.Goldin

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Measuring Instruments: Principle of operation, construction detail, torque equation.
2.	Lecture 2	Measuring Instruments: construction detail and torque equation.
3.	Lecture 3	scale shape, uses and error in Moving iron Instruments.
4.	Lecture 4	Electrodynamics and induction instruments for the measurement of voltage, current, power and energy
5.	Lecture 5	Electrodynamics and induction instruments for the measurement of voltage, current, power and energy
6.	Lecture 6	Galvanometers: D'Arsonval galvanometers.
7.	Lecture 7	Galvanometers: Vibration and Ballistic galvanometers.
8.	Lecture 8	Dynamic equation of motion and its solution for various

		conditions.
9.	Lecture 9	Relative damping, logarithmic decrement and galvanometer sensitivities.
10.	Lecture 10	Potentiometers: Theory of operation and construction of D.C. potentiometers .
11	Lecture 11	Potentiometers: Theory of operation and construction of potentiometers (polar and coordinate type)
12	Lecture 12	Their standardization and applications.
13	Lecture 13	Measurements of Resistance: Methods of measurement of medium and low resistances
14	Lecture 14	Measurements of Resistance: Methods of measurement of high resistances
15	Lecture 15	three and four terminal type resistance
16	Lecture 16	Kelvin's double bridge.
17	Lecture 17	Price's guard wire and Loss of charge method.
18	Lecture 18	measurement of 3 phase active power
19	Lecture 19	measurement of 3 phase reactive power
20	Lecture 20	A.C. Bridges-Four arm A.C. Bridge for the measurement of inductance and capacitance.
21	Lecture 21	A.C. Bridges-Four arm A.C. Bridge for the measurement of quality and dissipation factor.
22	Lecture 22	Screening, Wagner earthing.
23	Lecture 23	Instrument Transformers: Theory and construction of current transformers.
24	Lecture 24	Instrument Transformers: Theory and construction of potential transformers.
25	Lecture 25	Ratio and phase angle errors and their minimization.
26	Lecture 26	effects of variation of power factor.
27	Lecture 27	secondary burden and frequency on errors.
28	Lecture 28	Testing of CTs and PTs.
29	Lecture 29	Magnetic Measurements-Determination of B-H curve and hysteresis loop of ring and bar specimens.
30	Lecture 30	Magnetic Measurements-Determination of B-H curve and hysteresis loop of ring and bar specimens.
31	Lecture 31	Measurement and separation of iron losses
32	Lecture 32	Electronic Instruments-Transistor voltmeter, TVM using FET in input stage
33	Lecture 33	Digital voltmeters: Ramp type and integrated type.
34	Lecture 34	Digital voltmeters: Measurement of time.
35	Lecture 35	phase and frequency using digital counters.
36	Lecture 36	Principle and working of cathode ray oscilloscope.
37	Lecture 37	Wave analyzers: Frequency selective wave analyzers and its applications
38	Lecture 38	Wave analyzers: heterodyne wave analyzers and its applications

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SECOND YEAR B.TECH. (III SEMESTER

LECTURE PLAN

Course No.: EE 237(PEC)

Course Name: ELECTRICAL ESTIMATION & COSTING Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	Electrical & Electronics Measurements & Instrumentation.	A.K. Sawhney
2.	Electronic Instrumentation	H.S. Kalsi
3.	Electrical Measurements	E.W.Goldin

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Estimating & Costing: Introduction, Estimating
2.	Lecture 2	Various Steps to Form an Estimate.
3.	Lecture 3	Purpose of Estimating & Costing, Quantities of a Good Estimator
4.	Lecture 4	Essential Elements of Estimating & Costing
5.	Lecture 5	Price List, Net Price, Purchase Organisation.
6.	Lecture 6	Common Hand Tools their uses, Care and Maintenance,
7.	Lecture 7	General Electrical Accessories and Insulating Materials,
8.	Lecture 8	Measurement of Earth Resistance and Testing of Installations.
9.	Lecture 9	Estimating and Conductor Size Calculations for Internal Wiring H.T.
10.	Lecture 10	L.T. Overhead Lines
11	Lecture 11	Under Ground Cables
12	Lecture 12	Installation and Estimates for Service Lines.
13	Lecture 13	Estimating and Costing of Material in Electrical nstallation for Residential Buildings
14	Lecture 14	Workshops and Halls
15	Lecture 15	Estimation of the quantity of materials and their cost required for the P.V.C. casing-capping wiring system used in

		a house the plan
16	Lecture 16	Estimates for L.T. Distributor and Street Light Feeders: A pole and stay assembly are to be erected. Determine the volume of excavation required to be done and also draw a list of material which will be used to provide such an arrangement
17	Lecture 17	Estimates for 11 K.V. Feeders and Substations: Determine the quantity of material required and cost for erecting 300 KVA 0.4/11kv substations. Assuming that 400 volts generator panel is at a distance of 50 m in an adjoining power house

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THIRD YEAR B.TECH. (V SEMESTER)

LECTURE PLAN

Course No.: EE 311

Course Name: POWER SYSTEM – II Faculty: Dr. Naveen Jain

Recommended Books:

S.No.	Title	Author
1.	Power system analysis	I.J. Grainger
2.	Power system engineering	Nagrath, Kothari
3.	Power system Distribution	B.R. Gupta
4.	Electrical Power system	C.L. Wadhwa

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Per Unit System: Percent and per unit quantities
2.	Lecture 2	single line diagram & impedance diagram for a balance system
3.	Lecture 3	single line diagram & impedance diagram for a balance system
4.	Lecture 4	Symmetrical Fault Analysis: Transient in R-L Circuit.
5.	Lecture 5	Symmetrical short-circuit current in synchronous generation.
6.	Lecture 6	asymmetrical short-circuit current in synchronous generation.
7.	Lecture 7	equivalent circuit of synchronous machine in different conditions.
8.	Lecture 8	analysis of three phase fault.
9.	Lecture 9	Symmetrical Component: Fortesque theorem .
10.	Lecture 10	Symmetrical Component: symmetrical component transformation.
11	Lecture 11	phase shift in star delta transformer.
12	Lecture 12	sequence impedance and sequence circuit for synchronous machine.
13	Lecture 13	transformer and transmission line of a power system
14	Lecture 14	sequence network of a power system.

15	Lecture 15	Unsymmetrical fault analysis: Single line to ground fault.
16	Lecture 16	Line to line fault and Double line to ground fault.
17	Lecture 17	Switchgear & Protection: Fuses, Selectivity, Discrimination, Sensitivity, Reliability
18	Lecture 18	Switchgear & Protection: Fuses, Selectivity, Discrimination, Sensitivity, Reliability
19	Lecture 19	Fastness, Time grading & current grading.
20	Lecture 20	Primary & back up protection.
21	Lecture 21	Construction & operation of relays: Electro –magnetic relays
22	Lecture 22	Construction & operation of relays: over current relays
23	Lecture 23	Reverse Power Directional relay.
24	Lecture 24	Instantaneous Earth Fault Relay and Buchholtz Relay
25	Lecture 25	Distance protection of transmission lines.
26	Lecture 26	C. T. & P. T. connection for distance relays.
27	Lecture 27	Unit Protection: Protection of Transformer.
28	Lecture 28	Protection of stator winding of alternator.
29	Lecture 29	Protection against Excitation failure.
30	Lecture 30	Prime mover failure, Frame Leakage.
31	Lecture 31	Differential protection of: Generator-Transformer unit .
32	Lecture 32	3-phase transformer, Buchholz protection.
33	Lecture 33	Circuit Breakers: Theorem of current interruption and Recovery theory
34	Lecture 34	Construction and operation of Bulk oil and Air blast
35	Lecture 35	MOCB and SF6 circuit breakers.
36	Lecture 36	Vacuum circuit breaker, Advantages & disadvantages of static relay.

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THIRD YEAR B.TECH. (V SEMESTER)

LECTURE PLAN

Course No.: EE 312

Course Name: POWER ELECTRONICS – I Faculty: Dr. Vinod Kumar Yadav

Recommended Books:

S.No.	Title	Author
1.	Power Electronics	Berdi
2.	Power Electronics	Bhimbra

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Semiconductor Power Devices: Characteristics of power Diodes
2.	Lecture 2	Semiconductor Power Devices: Characteristics of power Diodes.
3.	Lecture 3	power Transistors like BJT, MOSFET& IGBT.
4.	Lecture 4	power Transistors like Diac, SCR and UJT.
5.	Lecture 5	Thyristor: Principle of operation and Construction .
6.	Lecture 6	Thyristor: characteristics, specification and ratings.
7.	Lecture 7	pulse transformer and optical isolators
8.	Lecture 8	methods of turn on of SCR.
9.	Lecture 9	Protection of SCR protection against over voltage.
10.	Lecture 10	over current, dv/dt and di/dt.
11	Lecture 11	switching surges and over heating.
12	Lecture 12	Gate protection, SCR mounting, Heat transfer process in SCR,
13	Lecture 13	Thyristor firing circuit- Principle features of a typical gate triggering circuit R .
14	Lecture 14	Thyristor firing circuit- Principle features of a typical gate triggering circuit R-C.
15	Lecture 15	UJT relaxation oscillator .
16	Lecture 16	Converters: Half wave converters for single, two phase.

17	Lecture 17	Converters: Half wave converters for three and six phase.
18	Lecture 18	Single phase full wave convertor with R, R-L and RLE loads
19	Lecture 19	three-phase full wave convertor with R, R-L and RLE loads.
20	Lecture 20	Performance factors for line commutated converters.
21	Lecture 21	Inversion operation semi converters and dual converter.
22	Lecture 22	Effect of source impedance.
23	Lecture 23	Microprocessor based firing scheme for three phase fully controlled bridge converter
24	Lecture 24	IV Power supplies: Basic series and shunt voltage regulators,
25	Lecture 25	Integrated circuit regulators.
26	Lecture 26	Switch mode d.c. Power supplies,
27	Lecture 27	Fly back converter and forward converter.
28	Lecture 28	push-pull converter, half and full bridge converters.
29	Lecture 29	A.C. power supplies; UPS configurations,
30	Lecture 30	A.C. power supplies; On-line and Off-line UPS.

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THIRD YEAR B.TECH. (V SEMESTER)

LECTURE PLAN

Course No.: EE 313

Course Name: ELECTRICAL MACHINES – II Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	Advanced Electrical Technology	H. Cotton.
2.	Electric Machines (Second Edition)	I.J. Nagrath & D.P.Kothari.
3.	Electrical Machines	P.K. Mucherjee & Scharkravorti.
4.	Electrical Machinery	P.S. Bhimbhra.

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Induction Motors: Rotating magnetic fields,
2.	Lecture 2	Construction and basic principal of induction motor.
3.	Lecture 3	induction motor as a generalized transformer,
4.	Lecture 4	phasor diagram and equivalent circuits.
5.	Lecture 5	no-load and blocked rotor tests,
6.	Lecture 6	circle diagram and calculation of performance
7.	Lecture 7	Torque-slip characteristic
8.	Lecture 8	effect of rotor resistance,
9.	Lecture 9	operating characteristics of induction motor.
10.	Lecture 10	speed control, starting and braking, cogging, crawling.
11	Lecture 11	Single Phase Induction Motor: Basic Principle, revolving field theory.
12	Lecture 12	Single Phase Induction Motor: methods of starting and equivalent circuit
13	Lecture 13	Induction generator, Induction regulators.
14	Lecture 14	Synchronous Generators- Constructional features
15	Lecture 15	general equation of induced emf,
16	Lecture 16	effect of distribution,

17	Lecture 17	chording, armature reaction,
18	Lecture 18	theory of cylindrical rotor machine.
19	Lecture 19	saturation effects, phasor diagram,
20	Lecture 20	open circuit, short circuit and zero power factor characteristic,
21	Lecture 21	Potier triangle, regulation by synchronous impedance.
22	Lecture 22	M.M.F. & A.S.A. methods and their relative comparison.
23	Lecture 23	Theory of Salient pole machines
24	Lecture 24	Blondel's two reaction theory
25	Lecture 25	phasor diagram, direct and quadrature-axis reactance their determination;
26	Lecture 26	parallel operation of alternators,
27	Lecture 27	synchronizing operation of infinite bus,
28	Lecture 28	synchronizing power, power-angle characteristics, stability
29	Lecture 29	Synchronous Motor: Construction, principle of operation,
30	Lecture 30	Synchronous Motor: equivalent circuit, phasor diagram
31	Lecture 31	power flow equation
32	Lecture 32	V curves, starting, hunting & damping.
33	Lecture 33	Commutator Motors-Effects of injected EMF
34	Lecture 34	commutator as frequency changer,
35	Lecture 35	single phase series motor and schrage motor
36	Lecture 36	Fractional Horse Power Motors: Construction, principle of operation, elementary analysis
37	Lecture 37	characteristics and applications of universal motors, repulsion motors.
38	Lecture 38	hysteresis motor, brush less motors,
39	Lecture 39	linear induction and stepper motors.

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THIRD YEAR B.TECH. (V SEMESTER)

LECTURE PLAN

Course No.: EE 314

Course Name: CONTROL SYSTEM – I Faculty: Dr. V Dave

Recommended Books:

S.No.	Title	Author
1.	Automatic Control System	C. Kuo Benjamim.
2.	Advance Control System	Ogata Katsuhika.
3.	Control System Engineering	I.J. Nagrath & M. Gopal.
4.	Linear Control System	B. S. Manke

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Representation of simple open loop and closed loop system, electrical analogs
2.	Lecture 2	I Representation of simple open loop and closed loop system, electrical analogs
3.	Lecture 3	Laplace transforms, Mathematical modeling, transfer functions
4.	Lecture 4	Laplace transforms, Mathematical modeling, transfer functions
5.	Lecture 5	block diagram reduction techniques,
6.	Lecture 6	signal flow graphs, mason's gain formula.
7.	Lecture 7	control system components – error detectors, potentiometers,
8.	Lecture 8	synchros, d.c. and a.c techogenerator
9.	Lecture 9	d.c .and a.c. servo motors.
10.	Lecture 10	Time Response analysis and Design specifications
11	Lecture 11	Transient and steady state response, standard test signals
12	Lecture 12	Time response of a first order system to standard signals, steady state error
13	Lecture 13	Time response of a second order system to standard signals, steady state error
14	Lecture 14	error coefficients, generalized error series sensitivity
15	Lecture 15	control actions (proportional, derivative and integral controls)

16	Lecture 16	control actions (proportional, derivative and integral controls)
17	Lecture 17	Concept of stability,
18	Lecture 18	Absolute stability, relative stability
19	Lecture 19	Routh Hurwitz criteria
20	Lecture 20	Characteristic equation,
21	Lecture 21	Root Locus Technique.
22	Lecture 22	Frequency Response Analysis: Frequency Domain Specification
23	Lecture 23	correlation between time and Frequency Response
24	Lecture 24	correlation between time and Frequency Response
25	Lecture 25	Polar plot,
26	Lecture 26	Bode Plot, Gain Margin, Phase Margin
27	Lecture 27	Nquist stability criteria
28	Lecture 28	Compensation: Lag Network
29	Lecture 29	Lead Network
30	Lecture 30	Lag-Lead Network

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FOURTH YEAR B.TECH. (VII SEMESTER)

LECTURE PLAN

Course No.: EE 411

Course Name: ELECTRICAL MACHINE DESIGN Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	A.C. Machine Design	M.G. Say
2.	Machine Design	A.K.Shawney

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Principle of electrical machine design- Design factors,
2.	Lecture 2	limitations in design,
3.	Lecture 3	magnetic circuit calculations,
4.	Lecture 4	magnetic leakage calculations
5.	Lecture 5	magnetising current calculations, unbalanced magnetic pull.
6.	Lecture 6	Heat dissipation, Heating, cooling curve.
7.	Lecture 7	Estimation of minimum temperature rise.
8.	Lecture 8	cooling media, quantity of cooling media,
9.	Lecture 9	design of fan, Ratings.
10.	Lecture 10	General features of armature winding,
11	Lecture 11	single layer, Double layer winding
12	Lecture 12	commutator winding
13	Lecture 13	integral & fractional slot winding,
14	Lecture 14	winding factors, harmonics.
15	Lecture 15	Eddy current losses in conductors
16	Lecture 16	Design of D.C. Machines, output equation,
17	Lecture 17	main dimensions, staggering of buses
18	Lecture 18	selection of no. of poles, airgap
19	Lecture 19	specific magnetic & electric loading.
20	Lecture 20	Design of transformers,.
21	Lecture 21	General consideration, output equation, EMF per turn

22	Lecture 22	main dimension conductor size
23	Lecture 23	window yoke & over all dimension,
24	Lecture 24	Design of Induction motors,
25	Lecture 25	output equation, selection of frame size,
26	Lecture 26	selection of no. of stator slots,
27	Lecture 27	calculation of air gap length & conductor size.
28	Lecture 28	Design of squirrel cage motor,
29	Lecture 29	Rotor bar, elimination of harmonic torque.
30	Lecture 30	Design of synchronous machine,
31	Lecture 31	output equation, selection of no. of slots,
32	Lecture 32	Runaway speed, main dimension,
33	Lecture 33	Effect of SCR on machine performance, airgap.

DEPARTMENT OF ELECTRICAL ENGINEERING

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MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, UDAIPUR

FOURTH YEAR B.TECH. (VII SEMESTER)

LECTURE PLAN

Course No.: EE 412

Course Name: ELECTRIC DRIVES AND CONTROL Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	Power Electronics	P.S.Bimbhra
2.	Power Electronics	Berde
3.	Power Electronics	Rasid

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Switching Mode Regulators: Buck regulators
2.	Lecture 2	Switching Mode Regulators: boost regulators
3.	Lecture 3	Switching Mode Regulators: buck-boost and Cuk regulators
4.	Lecture 4	Ac Voltage Controllers: Single-phase AC controllers with R load
5.	Lecture 5	Ac Voltage Controllers: Single-phase AC controllers with RL load
6.	Lecture 6	sequence control of AC controllers,
7.	Lecture 7	three phase AC controllers
8.	Lecture 8	Dynamics Of Electric Drives: Fundamental Torque Equations,
9.	Lecture 9	SpeedTorque conventions And Multi-quadrant Operation
10.	Lecture 10	SpeedTorque conventions And Multi-quadrant Operation
11	Lecture 11	Equivalent Values Of Drive Parameters
12	Lecture 12	Components Of Load Torques
13	Lecture 13	Nature And Classification Of Load Torques,
14	Lecture 14	Calculation Of Time And Energy Loss In Transient Operation,
15	Lecture 15	Steady State Stability
16	Lecture 16	Load Equalization.
17	Lecture 17	D.C. Drives: Characteristics of separately exited D.C. Motor

18	Lecture 18	D.C. Drives: its operating modes for motoring regenerating braking.
19	Lecture 19	D.C. Drives: its operating modes for motoring and dynamic braking.
20	Lecture 20	Types of Electrical braking,
21	Lecture 21	Phase control drives
22	Lecture 22	chopper control drives.
23	Lecture 23	Block diagram and explanation for close loop control of d.c. drive.
24	Lecture 24	Soft start, acceleration control and current limiting,
25	Lecture 25	various industrial applications of drive.
26	Lecture 26	A.C. drive-Speed control of Induction motor,
27	Lecture 27	stator voltage control & soft start,
28	Lecture 28	variable frequency control from current sources
29	Lecture 29	rotor resistance control, slip power recovery.
30	Lecture 30	Block diagrams & their explanation for closed loop control,
31	Lecture 31	stator voltage control,
32	Lecture 32	volts hertz control with current limiting,
33	Lecture 33	volts hertz control with slip regulation, static cramer drive.
34	Lecture 34	Synchronous motor drive-volts hertz control
35	Lecture 35	brushless d.c. and a.c. motors.
36	Lecture 36	Sensor less control Electric drives.

DEPARTMENT OF ELECTRICAL ENGINEERING

COLLEGE OF TECHNOLOGY AND ENGINEERING

MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, UDAIPUR

FOURTH YEAR B.TECH. (VII SEMESTER)

LECTURE PLAN

Course No.: EE 413

Course Name: ELECTRICAL ENGINEERING ECONOMICS AND MANAGEMENT Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	Industrial organization and Engineering Economics	Banga and Sharma
2.	Electrical Engineering Economics	G.P. Chhalotra

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Definition of Economics, Income, Investment, Assets,
2.	Lecture 2	Liability, utility, Market and its types, Money, Price, value,
3.	Lecture 3	wants, wealth, capital and its types, supply and demand ,
4.	Lecture 4	Law of Returns, Concept of physical and financial efficiency of electrical goods and services,
5.	Lecture 5	Importance of Engineering economics,
6.	Lecture 6	Annuities and its kind, Profit,
7.	Lecture 7	supply & demand, elasticity, necessity & luxuries.
8.	Lecture 8	free competition and monopoly, law of diminishing returns.
9.	Lecture 9	Depreciation and its various method for calculating
10.	Lecture 10	Straight line, diminishing balance,
11	Lecture 11	Sinking fund, sum of the Year Digit method,
12	Lecture 12	Depreciation in utilizing electrical energy.
13	Lecture 13	Element of cost, Direct and Indirect expenses,
14	Lecture 14	component of cost, Depreciation
15	Lecture 15	Depreciation and its various method for calculation-Straight line,
16	Lecture 16	diminishing balance, Sinking fund,
17	Lecture 17	sum of the Year Digit. Linear break-even analysis Comparison of alternatives-
18	Lecture 18	Annual cost, Present worth,
19	Lecture 19	Rate of return, payback & benefit to cost ratio methods.
20	Lecture 20	Economical choice of electrical apparatus,

21	Lecture 21	economic life of electrical machine
22	Lecture 22	Economic choice of motors,
23	Lecture 23	Transformers, Electrical lamps
24	Lecture 24	Economic choice of Transmission Line and Distribution substation,
25	Lecture 25	Kelvin Law for cables.
26	Lecture 26	Management-, Functions of Management, office management,
27	Lecture 27	Human Resource Management, store management

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MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, UDAIPUR

FOURTH YEAR B.TECH. (VII SEMESTER)

LECTURE PLAN

Course No.: EE 414

Course Name: ELECTRIC ENERGY SYSTEMS THEORY Faculty: Dr. R R Joshi

Recommended Books:

S.No.	Title	Author
1.	Electric Energy Systems Theory	Olle L. Elgerd.
2.	Power System Analysis,	C.A. Ggross.

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Fundamental concept of electric energy system theory
2.	Lecture 2	Fundamental concept of electric energy system theory
3.	Lecture 3	electric supply systems
4.	Lecture 4	economics of power transmission.
5.	Lecture 5	economics of power transmission.
6.	Lecture 6	flow analysis: Static load flow equation,
7.	Lecture 7	system variable and its solution,
8.	Lecture 8	Bus admittance matrix,
9.	Lecture 9	Bus classification,
10.	Lecture 10	Solution of load flow problem by gauss siedal,
11	Lecture 11	Solution of load flow problem by gauss siedal,
12	Lecture 12	Newton Rephson and fast decoupled method,
13	Lecture 13	Comparison of above method.
14	Lecture 14	The energy system in steady state-Basic generator control loops,
15	Lecture 15	The energy system in steady state-Basic generator control loops,
16	Lecture 16	Mathematical modeling and description of various components of automatic voltage regulator,
17	Lecture 17	Mathematical modeling and description of various components of automatic voltage regulator,
18	Lecture 18	steady state performance of AVR.

19	Lecture 19	dynamic performance of AVR.
20	Lecture 20	Automatic load-frequency control of single area system,
21	Lecture 21	Mathematical modeling and description of various components of ALFC,
22	Lecture 22	Mathematical modeling and description of various components of ALFC,
23	Lecture 23	steady state and dynamic performance of ALFC,
24	Lecture 24	steady state, dynamic and transient stabilities,
25	Lecture 25	steady state, dynamic and transient stabilities,
26	Lecture 26	Equal Area criterion,
27	Lecture 27	step by step method of solving swing equation.
28	Lecture 28	step by step method of solving swing equation.

DEPARTMENT OF ELECTRICAL ENGINEERING

COLLEGE OF TECHNOLOGY AND ENGINEERING

MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, UDAIPUR

FOURTH YEAR B.TECH. (VII SEMESTER)

LECTURE PLAN

Course No.: EE 415

Course Name: GENERATION OF ELECTRICAL POWER Faculty: GF

Recommended Books:

S.No.	Title	Author
1.	Generation of Electrical Energy	B.R. Gupta
2.	Principles of Power system	V.K. Mehta
3.	Generation of Electrical Power	Soni, Gupta and Bhatnagar
4.	Power System Analysis	C.A. Gross

S.No.	Lecture No.	Topics and Contents
1.	Lecture 1	Method of Bulk Energy Generation: Introduction to thermal power plants with their layouts,
2.	Lecture 2	Method of Bulk Energy Generation: Introduction to hydral power plants with their layouts,
3.	Lecture 3	Method of Bulk Energy Generation: Introduction to nuclear and gas power plants with their layouts,
4.	Lecture 4	Concept of co-generation, Impact of thermal stations on environment.
5.	Lecture 5	Concept of co-generation, Impact of hydro and nuclear stations on environment.
6.	Lecture 6	New Energy Sources: Elementary ideas of electric energy generation by wind.
7.	Lecture 7	New Energy Sources: Elementary ideas of electric energy generation by solar.
8.	Lecture 8	New Energy Sources: Elementary ideas of electric energy generation by tidal and geothermal energy .
9.	Lecture 9	New Energy Sources: Elementary ideas of electric energy generation by fuel cell, Open and close cycle MHD power generation.

10.	Lecture 10	Load And Load Curve: Types of load,
11	Lecture 11	chronological load curves, load duration curve,
12	Lecture 12	energy load curve, mass curve,
13	Lecture 13	maximum demand, demand factor
14	Lecture 14	load factor, capacity factor.
15	Lecture 15	utilization factor, diversity factor
16	Lecture 16	Power Plant Economics: Capital cost of plants,
17	Lecture 17	annual fixed and operating costs of plants,
18	Lecture 18	generation cost and depreciation.
19	Lecture 19	Effect of load factor on unit energy cost,
20	Lecture 20	Role of load diversity in power system economics
21	Lecture 21	off peak energy utilization. Energy cost reduction.
22	Lecture 22	Tariffs: Objectives of tariffs.
23	Lecture 23	General tariff form, flat demand rate, straight meter rate
24	Lecture 24	block meter rate, two part tariffs,
25	Lecture 25	power factor dependent tariffs, three part tariff,
26	Lecture 26	spot (time differentiated) pricing.
27	Lecture 27	Power Factor Improvement: Causes and effects of low power factor,
28	Lecture 28	advantages of power factor improvement,
29	Lecture 29	power factor improvement using shunt capacitors and synchronous condensers.
30	Lecture 30	Calculation of most economical power factor when kW demand is constant and kVA demand is constant.
31	Lecture 31	Calculation of most economical power factor when kW demand is constant and kVA demand is constant.
32	Lecture 32	Selection Of Power Plant: Comparative study of thermal, hydel power plants.
33	Lecture 33	Selection Of Power Plant: Comparative study of nuclear and gas power plants.
34	Lecture 34	Base load and peak load plants,
35	Lecture 35	Size of generating units, types of reserve and size of plant.
36	Lecture 36	Selection and location of power plants.