

B. Tech (EEE 5th Semester) : Power Quality & Management (EEN-301N)

Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Overview and Definitions of power quality		
2	Overview and Definitions of power quality		
3	Overview and Definitions of power quality		
4	Overview and Definitions of power quality		
5	sources of pollution		
6	sources of pollution		
7	sources of pollution		
8	international power quality standards and regulations		
9	international power quality standards and regulations		
10	international power quality standards and regulations		
CHAPTER 2			
11	Surges		
12	swell		
13	voltage sag		
14	over voltage under voltage		
15	outage voltage phase angle imbalance		
16	electric noise		
17	harmonics,		
18	frequency deviation monitoring		
19	frequency deviation monitoring		
20	frequency deviation monitoring		
CHAPTER 3			
21	Harmonic analysis		
22	harmonic sources – the static converters		
23	transformer magnetization		
24	non-linear machines are furnaces,		
25	non-linear machines are furnaces,		
26	fluorescent lighting.		
27	Harmonic effect within the power system,		
28	Harmonic effect within the power system,		
29	interference with communication harmonic measurements		

30	interference with communication harmonic measurements		
CHAPTER 4			
31	Design, measure to minimize the frequency		
32	Design, measure to minimize the frequency		
33	duration of outages in distribution systems voltage regulators		
34	harmonic filters		
35	power conditioners,		
36	uninterruptible power suppliers		
37	emergency and stand by power systems		
38	application of power conditioners		
39	Power distribution systems design,		
40	measure to minimize voltage disturbances		

B. Tech (EEE 5th Semester) : VLSI Design (EEN-303N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Monolithic Silicon Fabrication Technology		
2	Monolithic Silicon Fabrication Technology		
3	Crystal Growth		
4	Crystal Growth		
5	Vapour phase (CVDT Technique)		
6	molecular beam epitaxy		
7	dry etching		
8	dry etching		
9	wet Etching.		
10	wet Etching.		
CHAPTER 2			
11	Oxide properties		
12	diffusion Fick's law		
13	dopant sources, Oxidation process		
14	Diffusion mechanism, oxidation kinetics		
15	Constant source & limited source diffusion		
16	Constant source & limited source diffusion		

17	Characterization of diffused layers, .		
18	Characterization of diffused layers, .		
19	Introduction to ion implantation		
20	Introduction to ion implantation		
CHAPTER 3			
21	Choice of metals,		
22	Vacuum evaporation		
23	Sputtering Metalization problems,		
24	Lithography: Introduction to Photo,		
25	X-ray		
26	X-ray		
27	electron beam lithography process,		
28	electron beam lithography process,		
29	various printing techniques		
30	various printing techniques		
CHAPTER 4			
31	Fabrication process,		
32	Sequence for a BJT,		
33	Sequence for a BJT,		
34	Capacitor,		
35	resistor		
36	IC		
37	Environment for IC fabrication,.		
38	Environment for IC fabrication,.		
39	Assembly & packaging techniques		
40	Assembly & packaging techniques		

B. Tech (EEE 5th Semester) : Power Electronics (EEN-305N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Characteristics of Diac		
2	Characteristics Triac and UJT.		

3	.....Do.....		
4	Protection of SCR against-over voltage , over current,		
5	Protection of SCR against dv/dt, di/dt,		
6	.....Do.....		
7	Heat sink design,		
8	Methods of commutation of SCR's		
9	.....Do.....		
10	Series and Parallel operation of Thyristors.		
CHAPTER 2			
11	Classification of rectifiers,		
12	principle of working of each along with control circuit		
13	principle of working of each along with control circuit		
14	, Analysis of output voltage and current waveforms.		
15	, Analysis of output voltage and current waveforms.		
16	Ripple factors		
17	utility factor and efficiency,		
18	Effect of source and load inductance		
19	Effect of source and load inductance		
20	Dual converter.		
CHAPTER 3			
21	Classification of Cycloconverters,		
22	Classification of Cycloconverters,		
23	principle of working along with control circuits		
24	principle of working along with control circuits		
25	Analysis of output voltage and current waveforms,		
26	Analysis of output voltage and current waveforms,		
27	Analysis of output voltage and current waveforms,		
28	presence of sub-harmonic in cycloconverter output.		
29	presence of sub-harmonic in cycloconverter output.		
30	presence of sub-harmonic in cycloconverter output.		
CHAPTER 4			
31	Classification of inverters		

32	Classification of inverters,		
33	operation of each type,		
34	operation of each type,		
35	Analysis of VOTAGE Aand current,		
36	Analysis of VOTAGE Aand current,		
37	,current source inverter,		
38	voltage source inverter		
39	pulse width modulated inverter		
40	pulse width modulated inverter		

B. Tech (EEE 5th Semester) : Control System (EE-307N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Introduction to basic terms, classifications & types of Control Systems,		
2	block diagrams & signal flow graphs		
3	Mathematical Models of Physical System,		
4	Differential equation of physical systems & electrical systems with analogy.		
5	Transfer function,		
6	determination of transfer function using block diagram reduction techniques and Mason's Gain formula.		
7	Error detectors, Signal conditioners		
8	Modulators, Demodulators,		
9	Servo amplifiers voltage and power, Actuators including servomotors		
10	Techogenerators, Stepper motor		
CHAPTER 2			
11	Time domain analysis,		
12	transient response of first & second order systems ,		
13	transient response of first & second order systems ,		

14	steady state error and static error constants in unity feedback control systems,		
15	steady state error and static error constants in unity feedback control systems,		
16	response with P,		
17	PI		
18	PID controllers		
19	PID controllers		
20	limitations of time domain analysis.		
CHAPTER 3			
21	Concept of stability,		
22	graphic and numeric techniques of stability analysis,		
23	Routh Hurwitz,		
24	Nyquist, Bode plot		
25	Root locii and polar plots		
26	frequency domain specifications and performance of LTI systems,		
27	Gain and phase margins,		
28	Correlation with time domain performance closed loop frequency responses from open loop response		
29	Correlation with time domain performance closed loop frequency responses from open loop response		
30	Limitations of frequency domain analysis.		
CHAPTER 4			
31	State space characteristics of control systems.		
32	Concepts of state variable,		
33	Concepts of state variable,		
34	Transfer Function controllability and observability		
35	Concepts of compensation,		
36	Concepts of compensation,		
37	, Concepts of compensation,		
38	, Concepts of compensation,		

39	Lag/Lead/Lag-Lead networks for compensation.		
40	Lag/Lead/Lag-Lead networks for compensation.		

B. Tech (EEE 5th Semester) : Power Transmission & Distribution (EE-309N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Typical power system,		
2	Modern trends in power system transmission		
3	Underground and overhead system,		
4	Effects of increase in Voltage on transmission line efficiency		
5	Distribution of Power: General consideration,		
6	Radial and ring main system		
7	Different types of distributors;		
8	Relative copper consumption in various systems.		
9	Conductor size and Kelvin's Law,		
10	Tariffs and power factor improvement.		
CHAPTER 2			
11	skin effects		
12	skin effects		
13	Proximity effect,		
14	Inductance of a single phase & two phase line		
15	Composite conductor lines,		
16	Three phase lines with symmetrical and unsymmetrical spacing,		
17	Bundled conductors		
18	Capacitance of two-wire line,		
19	three phase line with symmetrical and unsymmetrical spacing,		

20	Effect of earth capacitance.		
CHAPTER 3			
21	Short, medium and long lines – their representation,		
22	Performance calculation,		
23	Performance calculation,		
24	Surge impedance Loading of transmission lines,		
25	, Calculation of synchronous phase modifier capacity.		
26	Corona loss & radio interference		
27	Factors affecting corona , advantages and disadvantages of corona		
28	disruptive critical voltage, visual critical voltage, corona power loss,		
29	, methods of reducing corona effects, advantages & disadvantages of corona,		
30	interference of power lines with neighboring communication lines.		
CHAPTER 4			
31	Cables for A.C & D.C systems,		
32	Insulation resistance and capacitance, capacitance measurement,		
33	cable loss, Power factor in cable		
34	Heating of cables Thermal characteristics,		
35	Use of inter sheaths, Capacitance grading.		
36	Mechanical Considerations Types of Insulators,		
37	Methods of equalizing voltage distribution,		
38	Line supports, various types of conductor material,		
39	Sag calculations, Effect of wind,		
40	Ice and temperature on sag, Conditions at erection		

Lecture No.	Topics to be Covered	References	Remarks
1	Review of vector algebra		
2	the three orthogonal co-ordinate systems and their inter-relation		
3	review of vector calculus in all the three coordinate systems: Line,		
4	surface & volume integrals, gradient, divergence & curl of vector		
5	physical significance of divergence & curl of vector, Divergence theorem		
6	stokes theorem, concept of solenoidal and irrotational fields.		
7	Gauss Law in electrostatics & its applications, uniform line		
8	surface & volume charge distributions, concept of electric field & electric potentials		
9	electric field & potential due to a linear dipole, Spherical & cylindrical capacitor		
10	energy density in electric field, method of images		
CHAPTER 2			
11	Magnetostatics: Magnetic flux density and magnetizing field intensity		
12	Biot Savart's law, Amperes circuital law & its applications		
13	Magnetic vector potentials, Magnetic field energy		
14	boundary conditions for both the electric		
15	magnetic fields at the interface of various types of media		
16	Laplace, Poisson's equation & continuity equation		
17	displacement current density, conduction current density		
18	Maxwell's equation in differential & integral forms		
19	time harmonic cases & their physical significance		
20	retarded potentials.		

CHAPTER 3			
21	UPW: Plane waves & uniform plane waves and their properties		
22	wave equations in various media		
23	Polarization & its types		
24	intrinsic impedance, propagation constant		
25	reflection & refraction of uniform plane waves		
26	reflection & refraction of uniform plane waves at the interface of conductor		
27	dielectric & dielectric-dielectric (both normal and oblique incidence)		
28	Relaxation time, skin effect		
29	skin depth & surface impedance		
30	Poynting vector theorem and its physical significance.		
CHAPTER 4			
31	Transmission lines: Distributed parameters		
32	circuit parameters, concepts of voltage & current flow on a transmission line		
33	line equations, characteristics impedance		
34	Reflection of transmission line		
35	maxima & minima, standing wave ratio of a transmission line		
36	impedance matching, Smith's chart & its applications		
37	co-axial type transmission line.		
38	Wave Guides: Brief idea of Wave Guides		
39	types of Wave Guides		
40	TE, TM and TEM modes in rectangular wave guides.		

B. Tech (EEE 7th Semester) : Utilization of Electrical Energy (EE-401N*)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Illumination: Term used in illumination,		

2	.....do.....		
3	Law's of illumination, sources of light,		
4	arc lamp		
5	incandescent lamp,		
6	discharge lamp, sodium vapor Lamp,		
7	mercury vapor lamp, florescent tubes,		
8	lightening schemes,		
9	method of lightning calculation.		
10	Numerical Based on method of lightning calculation.		
CHAPTER 2			
11	Electrical Heating: Advantages of Electrical Heating, various types of Electrical heating,		
12	.....do.....		
13	Power frequency and High frequency heating,		
14	.....do.....		
15	Degree of heating element, Equivalent circuit of arc furnace,		
16	Resistance heating		
17	.....do.....		
18	Arc heating		
19	Induction heating		
20	dielectric heating, Electric Welding: All types of electrical welding		
21	resistance welding,		
22	arc welding,		
23	electrical winding equipment,		
24	Comparison between AC & DC welding		
25	types of electrodes, advantages of coated electrodes.		
CHAPTER 3			
26	Electroplating: Basic principle,		
27	faraday's law of electrostatics, terms used,		
28	Application of electrolysis,		
29	factors governing electro deposition, power supply		
30	Refrigeration & Air Conditioning: Basic principle,		
31	various compression cycle & system its application,		

32	.....do.....		
33	electric circuit of refrigerator		
34	air conditioner.		
35	Revision		
	CHAPTER 4		
36	Traction Motors: Different system of electric traction		
37	comparison between AC & DC system, block diagram of traction system		
38	Starting-Speed control and braking- Speed control		
39	braking –Speed time curves		
40	Mechanics of Train movement-		
41	Tractive effort for acceleration – Power and energy output from driving axles		
42	.....do.....		
43	Specific energy output and consumption-Train resistance.		
44	.....do.....		
45	Revision		

B. Tech (EEE 7th Semester) : Electronic Instruments and Measurements (EEN-403N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	C.R.O.: Introduction,		
2	Cathode Ray Tube (CRT),		
3	Electron Gun, Electrostatic Focusing, Electrostatic Deflection, Post Deflection		
4	Acceleration of Electron Beam, Effect of Beam Transit Time, Frequency limitation.		
5	Deflection plates, Screens of CRT's Graticule Aquadog, Applications,		
6	Storage C.R.O. Digital CRO. Design of delay lines for CRO.		
7	Amplifier Measurement: Transient response of Amplifiers,		
8	Measurements of Noise figure of Amplifier		
9	Harmonic Distortions analyzer,		

10	Distortion Meter, Measurement of op- amp parameters		
CHAPTER 2			
11	Digital Instruments: Digital Indicating instruments		
12	comparison with analog type digital display methods, theory and applications of digital voltmeters		
13	.....do.....		
14	Transistor, FET and other type of voltmeters.		
15	Electronic Galvanometers		
16	Q-meter.		
17	Frequency Measurements: - Measurements of frequency use cavity wave-meter.		
18	Heterodyne frequency meter,		
19	comparison of frequency using interpolation method		
20	Digital frequency meter. Frequency measurements using digital means.		
CHAPTER 3			
21	Signal Conditioning & Acquisition System: Signal conditioning		
22	A/D converter,		
23	D/A Converter		
24	Revision		
25	Use of op-amp in signal conditioning,		
26	Components of analog data acquisition System. Components of digital data acquisition system,		
27	signal conditioning, multiplex special Encoders		
28	.....do.....		
29	Principles of Telemetry, Wire link channels,		
30	Ratio channels, and Microwaves Channels.		
CHAPTER 4			
31	Instruments For Signals Generation: Pulse and square wave circuits		
32	.....do.....		
33	Laboratory square wave and pulse generators		

34	Function generators,		
35	Random noise generators,		
36	Frequency Synthesizer.		
37	.....do.....		
38	Bio-Medical Instruments:- ECG, EEG,		
39	EMG & Measurement of BP.		
40	Revision		

B. Tech (EEE 7th Semester) : Advance Programming (EEN-405N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Review of Elementary Data Structures: arrays,		
2	.....do.....		
3	stacks,		
4	queues,		
5	Revision		
6	link list with respect to storage representation & access methods		
7	.....do.....		
8	.....do.....		
9	.....do.....		
10	Revision of unit 1		
CHAPTER 2			
11	Searching Methods: Sequential		
12	.....do.....		
13	binary,		
14	.....do.....		
15	Indexes searches.		
16	.....do.....		
17	.....do.....		
18	Revision of Unit 2		
19	Class Test		
CHAPTER 3			

20	Sorting: internal and external sorting,		
21	.....do.....		
22	Sorting Methods: bubble,		
23	insertion,		
24	selection,		
25	merge, heap		
26	radix and quick sort.		
27	.....do.....		
28	Comparison with respect to their efficiency.		
29	Revision		
	CHAPTER 4		
30	C++ Programming Language: Concept of object oriented programming		
31	Abstract Data type C classes		
32	Data encapsulation,		
33	inheritance,		
34	polymorphism,		
35	.....do.....		
36	virtual function templates implementation using C++.		
37	.....do.....		
38	Revision of Unit 3		
39	Class Test		

B. Tech (EEE 7th Semester) : Elective-1: HVDC Transmission (EEN-415N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Merits and Demerits of HVDC over EHVAC,		
2	.....do.....		
3	type of HVDC links		
4	Analysis Of 3- phase bridge converter with grid control for U □ 60□ and U □ 60□		

5	.....do.....		
6	.....do.....		
7	.....do.....		
8	derivation of equivalent circuit of HVDC link.		
9	.....do.....		
10	Revision of Unit 1		
CHAPTER 2			
11	Basic means of control of HVDC link,		
12	C.C.A., C.C. and C.E.A, Control Characteristics of a converter,		
13	.....do.....		
14	.....do.....		
15	Harmonics in HVDC Operation,		
16	characteristics harmonics,		
17	characteristic AC current harmonics		
18	Non characteristics AC harmonics		
19	types of filters used for harmonic elimination,		
20	harmful effects.		
CHAPTER 3			
21	Protection aspects of a HVDC link,		
22	.....do.....		
23	types of faults,		
24	.....do.....		
25	over current protection,		
26	over voltage protection,		
27	ground and short circuit fault & their protection		
28	.....do.....		
29	Revision of Unit 3		
30	Class Test		
CHAPTER 4			
31	Parallel operation of A.C. and D.C. Systems		
32	.....do.....		
33	.....do.....		

34	.....do.....		
35	Corona & R.I characteristics of HVDC link		
36	.....do.....		
37	.....do.....		
38	Revision of Unit 4		
39	Class Test		

B. Tech (EEE 7th Semester) : Elective-II: Non-Conventional Energy Sources (EEN-421N)			
Lect. No.	Topics to be Covered	Proposed Lect. Date	Remarks
1	Introduction: Energy demand of world and country and gap analysis		
2	.....do.....		
3	Fossil fuel based systems		
4	Impact of fossil fuel based systems		
5	Non conventional energy – seasonal variations and availability,		
6	Renewable energy – sources and features,		
7	Hybrid energy systems.		
8	.....do.....		
9	Distributed energy systems and dispersed generation (DG).		
10	.....do.....		
CHAPTER 2			
11	Solar thermal systems: Solar radiation spectrum,		
12	Radiation measurement, Technologies, Applications,		
13	.....do.....		
14	Heating, Cooling, Drying, Distillation		
15	Power generation; Costing		
16	Life cycle costing (LCC)		
17	Solar thermal system.		

18	Solar Photovoltaic systems ,Operating principle, Photovoltaic cell concepts ,		
19	Cell, module, array, Series and parallel connections,		
20	Maximum power point tracking, Applications		
21	Battery charging, Pumping , Lighting,Peltier cooling		
22	Costing: Life cycle costing ,Solar PV system		
23	.....do.....		
CHAPTER 3			
24	Microhydel: Operating principle, Components of a microhydel power plant,		
25	.....do.....		
26	Types and characteristics of turbines,		
27	Selection and modification, Load balancing,		
28	Costing: Life cycle costing -Microhydel		
29	Wind; Wind patterns and wind data,		
30	Site selection, Types of wind mills		
31	Characteristics of wind generators,		
32	Load matching,		
33	Life cycle costing - Wind system LCC		
CHAPTER 4			
34	Biomass: Learning objectives, Operating principle,		
35	Combustion and fermentation, Anaerobic digester,		
36	Wood gassifier, Pyrolysis, Applications		
37	Bio gas,		
38	Wood stoves, Bio diesel		
39	Combustion engine		
40	Life cycle costing - Biomass system LCC		
41	Hybrid Systems, Need for Hybrid Systems, Range and type of Hybrid systems,		
42	Case studies of Diesel-PV,		
43	Wind-PV, Microhydel-PV		
44	Biomass-Diesel systems		
45	electric and hybrid electric vehicles		

46do.....		
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