Course of Study and Scheme of Examination
B.E. Electrical and Electronics Engineering
SEMESTER – VII

Scheme: BE (EX)_July2010 Implemented from academic session 2010-11

S.No	Course Code (New)	Name of course	Hours Per week			CREDITS	Distribution of Marks					
							Theory Exam	Practical Exam	Internal Assessment			Total
									MST	TW	Total	
			L	T	P	C	I	II			III	I+II+III
1	EX701	Power System-II	3	1	2	6	100	50	20	30	50	200
2	EX702	Computer Applications to Power Systems	3	1	0	4	100	-	20	-	20	120
3	EX703	Digital Signal Processing	3	1	0	4	100		20		20	120
4	Refer Table below	Elective-I	3	1	-	4	100	-	20	-	20	120
5	Refer Table below	Elective-II	3	1	-	4	100	-	20	-	20	120
6	EX704	Major Project (Planning & Literature survey)	0	0	4	4	-	50	-	30	30	80
7	EX705	Industrial Training (two weeks)*	0	0	2	2	-	50	-	50	50	100
8	EX706	Self-study	0	0	2	2	-	-	-	30	30	30
9	EX707	Seminar/Group Discussion etc.	0	0	2	2	-	-	-	30	30	30
10	EX708	Electrical Simulation Lab	-	-	2	2		50		30		80
		Total	15	5	14	34	500	200	100	200	300	1000

ELECTIVE – I							
EX-7101	High Voltage Engg.	**EX-7102**	SCADA Systems and Applications	**EX-7103**	**VLSI**		
ELECTIVE – II							
EX-7201	EHV AC and DC Transmission	**EX-7202**	Optical Communication	**EX-7203**	Computer Networks		

* Students will go for Industrial Training after VI semester in the summer vacations and will be assessed in VII semester.
MST-Mid Semester Test, TW-Term Work
Note :- 1.Minimum strength of **Ten Students** is required to offer an Elective in the College in a particular Academic Session.
2. Choice of Elective Course ones made for an examination cannot be changed for future examinations.

Course of Study and Scheme of Examination

B.E. Electrical and Electronics Engineering

SEMESTER – VIII

Scheme: BE (EX)_July2010 **Implemented from academic session 2010-11**

S. No	Course Code (New)	Name of Course	Hours Per week			CREDITS	Distribution of Marks					
							Theory Exam	Practical Block	Internal Assessment			Total I+II+III
									MST	TW	Total III	
			L	T	P	C	I	II				
1	EX801	Computer Aided Electrical Machine Design	3	1	2	6	100	50	20	30	50	200
2	EX802	Electrical Drives	3	1	2	6	100	50	20	30	50	**200**
3	Refer Table below	Elective –III	3	1	0	4	100	-	20	-	20	**120**
4	Refer Table below	Elective -IV	3	1	0	4	100	-	20	-	20	**120**
5	EX803	Major Project	0	0	8	8	-	100	-	100	100	**200**
6	EX804	Industrial Project	0	0	2	2	-	50	-	30	30	**80**
7	EX805	Self Study	0	0	2	2	-	-	-	50	50	**50**
8	EX806	Seminar/Group Discussion etc.	0	0	2	2				30	30	**30**
	Total		**12**	**4**	**18**	**34**	**400**	**250**	**80**	**270**	**350**	**1000**

ELECTIVE-III					
EX 8301	Power Quality	EX-8302	Advanced Communication System	EX-8303	Fuzzy Logic & Neural Network
ELECTIVE-IV					
EX-8401	SOFT COMPUTING TECHNIQUES & APPLICATIONS	EX-8402	Digital Electronics & Logic Design-II	EX-8403	Digital Image Processing

Note 1.Minimum strength of **Ten Students** is required to offer an Elective in the College in a particular Academic Session.

2. Choice of Elective Course ones made for an examination cannot be changed for future examinations

PROGRAMME: B.E. Electrical & Electronics Engineering, VII Semester
Course: EX701 Power System II

COURSE TITLE	COURSE CODE				THEORY PAPER
Power System II	EX701	L	T	P	**Max.Marks-100** Min.Marks-35
		3	1	2	Duration-3hrs.

Course Contents

Unit-I

General - Problems associated with modern interconnected power Systems, deregulation, power systems restructuring, distributed generation, congestion, available transfer capacities, pricing of energy and transmission services.

Unit-II

Power flow studies - Formulation of static power flow equations and solutions using Gauss- Seidel, Newton Raphson and FDLF methods, comparison of these methods, Economic operation of power system - Economic dispatch, Emission dispatch, line loss, ITL, economic dispatch using lagrangian multiplier method.

Unit-III

MW Frequency control- Coherency, control area, modeling of speed control mechanism, load damping, block diagrammatic representation of single and two area interconnected system, static and dynamic response, .optimum parameter adjustment.

Unit-IV

MVAR Voltage control Problem- Difference in control strategy over MW – f control, characteristics of an excitation system, DC AC and static excitation system, General block diagram representation of voltage regulators.

Unit-V

Power System Stability - Steady state, dynamic and transients stability, Swing equation , equal area criterion, solution of swing equation using step by step method modified Eulers method and Rnge-Kutta method, methods of improving transient stability.

Reference Books :

1. Modern Power System Analysis-by I.J. Nagrath & D.P. Kothari Tata Mc Graw – Hill Publication Company Ltd 2nd edition.
2. Electrical Power Systems-by C.L. Wadhwa New Age International (P) Limited Publishers, 2nd edition 1998.
3. Reactive power Control in Electric Systems-by T.J.E. Miller, John Wiley & Sons.
4. T.K. Nagsarkar, M.S. Sukhiza, -"Power System Analysis", Oxford University Press.
5. Elgerd O.I., "Electric Energy Systems Theory", TMH, New Delhi, Second Edition 1983.
6. Prabha Kundur, "Power system stability and control", Mc-Graw Hill Inc, New York, 1993.
7. Taylor C.W., "Power System Voltage Stability", Mc-Graw Hill Inc, New York, 1993.
8. Nagrath IJ, Kothari D.P., "Power System Engineering", Tata Mc-Graw Hills, New Delhi 1994.
9. Weedy B.M. "Electric Power System" John Wiley and Sons, 3rd edition.
10. P.S.R. Murthy, "Power System Operation and Control", Tata Mc-Graw Hill, New Delhi 1984.
11. Power Generation, Operation and Control by A.J. wood and B.F. Wollenberg John Wiley & Sons Inc. 1984.
12. Power Systems Analysis- by A.R. Bergen Prentice Hali Inc.
13. Economic Operation of Power Systems- by L.K. Kirchmayer Wiley Eastern Ltd.

List Of Experiments:

1. To develop a program in Matlab for information of Y-bus matrix for N bus system.
2. Load flow solution for 3-bus system using Gauss- Seidel, Newton Raphson and FDLF methods up to 3 iteration.
3. Load flow solution for IEEE 6-bus and 30-bus system in Matlab using Newton Raphson method.
4. Assessment of transient stability of a single machine system.
5. Effect of compensation on voltage profile of IEEE 6-bus system.
6. Study of any software tools (PSAT, EDSA, MY POWER, ETAP etc).

PROGRAMME : BE Electrical & Electronics Engineering-VII Semester

Course: EX-702

Computer Applications to Power Systems

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental	Computer Applications to Power Systems	EX702	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.

Course Contents

Unit-I

Models of power system components, network model using graph theory, formation of Z bus, transmission line models, regulating transformer, line loadability, capability curves of alternator.

Unit-II

Control of load bus voltage using reactive power control variable, SVC & SVS, Regulated shunt compensation, series and shunt compensation, Uniform series and shunt compensation and effect on loadability of transmission lines.

Unit-III

Sensitivity analysis- General sensitivity relations, generation shift distribution factors, line outage distribution factors, compensated shift factors, sensitivity associated with voltage-VAR, sensitivities relating load bus voltage changes in terms of PV bus voltage changes, sensitivity relating changes in reactive power generation for changes in PV Bus Voltage.

Unit-IV

Power system security – Security functions, Security level, contingency analysis, security control, economic dispatch using LP formulation, pre-contingency and post- contingency, corrective rescheduling.

Unit-V

Voltage stability - Difference between voltage and angle stability, PV Curve for voltage stability assessment, proximity and mechanism, modal analysis using reduced Jacobian, participation factor, effect of series and shunt compensation on voltage stability , effect of load models.

References:

.

1. Power Generation, Operation and Control by A.J. wood and B.F. Wollenberg John Wiley & Sons Inc. 1984.
2. Computer methods in power systems analysis – by stage G.W. and E.L. Abiad A.H. Mc Graw Hill.
3. Computer Techniques in Power Systems Analysis- Pai M.A. Tata Mc Graw Hill.
4. Computer Modeling of Electrical Power Systems, Arrillaga J. Arnord C.P Harker B.J. John Wiley & Son
5. Computer Aided Power Systems Analysis Kusic G.L. Prentice Hall Publication.
6. Modern Power Systems Analysis Nagrath I.J. and Kothari D.P. Tata Mc Graw Hill.
7. Power System Analysis Grainger J.J. & Stevnson W.D. Mc Graw Hill.
8. Power System Stability and control –P Kundur ,IEEE Press 1994.
9. Advance Power Systems Analysis and Dynamics Singh L.P. John Wiley.

PROGRAMME: B.E. Electrical and Electronics Engineering, VII Semester
Course: EX 703 Digital Signal Processing

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS - 4C			THEORY PAPERS
			L	T	P	
Departmental Core	Digital Signal Processing	EX703	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

COURSE CONTENTS

Unit-I

Introduction to Digital Signal Processing, Discrete time signals & systems, linear shift invariant systems, stability and causality, Linear-constant coefficient difference equations, Frequency domain representation of discrete time signals and systems, properties of the Discrete Time Fourier transform (DTFT), Sampling and discrete time processing of continuous-time signals.

Unit-II

Applications of z-transforms, solution of difference equations of digital filters, System function, stability criterion, frequency response of stable systems, one sided Z-transform and its applications.

Unit-III

Discrete Fourier series: Properties of discrete Fourier series, DFS representation of periodic sequences. Discrete Fourier Transforms: Properties of DFT: Fast Fourier Transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms. Inverse FFT.

Unit-IV

IIR DIGITAL FILTERS: Analog filter approximations - Butterworth and Chebyshev, Design of IIR Digital filters from analog filters, Bilinear transformation method, step & impulse invariance techniques, Spectral Transformations, Realization of IIR digital filters - direct, canonic, cascade & parallel forms.

Unit-V

FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters frequency response, Design of FIR Digital Filters using Window Techniques. Comparison of IIR and FIR filters, Realization of FIR digital filters - direct, linear phase, cascade & parallel forms.

References:

1. Oppenheim & Schaffer, Digital Signal Processing, PHI.
2. S.K. Mitra, Digital Signal Processing, TMH
3. Proakis and Manolakis, DSP.
4. A. Antoniou, Digital Filters Analysis & Design, TMH

PROGRAMME : BE Electrical & Electronics Engineering-VII Semester

Course: EX7101 High Voltage Engineering

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental	High Voltage Engineering	EX7101	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Course Contents

Unit-I

Introduction:-Introduction to HV technology, advantages of transmitting electrical power at high voltages, need for generating high voltages in laboratory. Important applications of high voltage.

Unit-II

Breakdown phenomena:- Classification of HV insulating media, Properties of important HV insulating media. Gaseous dielectrics: Ionizations: primary and secondary ionization processes. Criteria for gaseous insulation breakdown based on Townsend's theory, Limitations of Townsend's theory. Streamer's theory breakdown in non uniform fields. Corona discharges. Paschen's law and its significance. Time lags of Breakdown. Breakdown in solid dielectrics: Intrinsic Breakdown, avalanche breakdown, thermal breakdown, and electro mechanic breakdown. Breakdown of liquids dielectric dielectrics: Suspended particle theory, electronic Breakdown, cavity breakdown (bubble's theory), electro convection breakdown.

Unit-III

Generation of HV AC DC and Impulse Voltage and current:- HV AC-HV transformer; Need for cascade connection and working of transformers units connected in cascade, Series resonant circuit- principle of operation and advantages. Tesla coil. HV DC- voltage doubler circuit, cock croft- Walton type high voltage DC set, Introduction to standard lightning and switching impulse voltages. Analysis of single stage impulse generator-expression for Output impulse voltage, Multistage impulse generator Components of multistage impulse generator. Triggering of impulse generator by three electrode gap arrangement. Triggering gap and oscillograph time sweep circuits. Generation of switching impulse voltage. Generation of high impulse current.

Unit-IV

Measurement of high voltages:- Electrostatic voltmeter-principle, construction and limitation. Generating voltmeter- Principle, construction. Series resistance micro ammeter for HV DC measurements. Standard sphere gap measurements of HV AC, HV DC, and impulse voltages;Factors affecting the measurements. Potential dividers-resistance dividers capacitance dividers mixed RC potential dividers. Surge current measurement.

Unit-V

High voltage tests on electrical apparatus:-Definitions of technologies, tests on isolators, circuit breakers, cables insulators and transformers.

Reference books:

1. E. Kuffel and W.S. Zaengl, “High voltage engineering fundamentals”, 2nd edition, Elsevier, press, 2005.
2. M.S.Naidu and Kamaraju, “High Voltage Engineering”, 3rd edition, THM, 2007.
3. L. L. Alston, “High Voltage technology”, BSB Publication, 2007..
4. Rakosh Das Begamudre, Extra High voltage AC transmission engineering, Wiley Easternlimited, 1987.
5. Transmission and distribution reference book-Westing House.C.L.Wadhwa, High voltage engineering, New Age International Private limited, 1995.

PROGRAMME : BE Electrical & Electronics Engineering-VII Semester

Course: EX7102: SCADA Systems and Applications

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental	**SCADA Systems and Applications**	EX7102	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Course Contents

Unit I

Introduction to SCADA and PLC:SCADA: Data acquisition system, evaluation of SCADA, communication technologies, monitoring and supervisory functions. PLC: Block diagram, programming languages, Ladder diagram, Functional Block diagram, Applications, Interfacing of PLC with SCADA.

Unit II

SCADA system components: Schemes, Remote Terminal Unit, Intelligent Electronic Devices, Communication Network, SCADA server.

Unit III

SCADA Architecture-Various SCADA Architectures, advantages and disadvantages of each system, single unified standard architecture IEC 61850 SCADA / HMI Systems.

Unit IV

SCADA Communication-Various industrial communication technologies- wired and wireless methods and fiber optics, open standard communication protocols.

Unit V

Operation and control of interconnected power system-Automatic substation control, SCADA configuration, Energy management system, system operating states, system security, state estimation. Unit VI: SCADA applications Utility applications, transmission and distribution sector operation, monitoring analysis and improvement. Industries oil gas and water. Case studies, implementation, simulation exercises.

Reference Books:

1. Stuart A Boyer: SCADA supervisory control and data acquisition.
2. Gordan Clark, Deem Reynders, Practical Modem SCADA Protocols.
3. Sunil S. Rao, Switchgear and Protections, Khanna Publication.

PROGRAMME : B.E. Electrical & Electronics Engg., VI Semester

Course: EX-7103- VLSI

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS - 4C			THEORY PAPERS
			L	T	P	
Departmental	VLSI	EX-7103	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

Course Contents

Unit-I

Overview of VLSI Design Methodology VLSI design process, Architectural design, Logical design, Physical design, Layout styles, Full custom & Semi custom approaches**.**

Basic Electrical Properties of MOS and CMOS Circuits, NMOS, PMOS, Transistors, MOS device equations, Basic DC equations second order effects, MOS modules, Small signal AC characteristics, NMOS inverter, Steered input to an NMOS inverter, depletion mode & enhancement mode pull ups, CMOS inverter, DC characteristics, inverter delay, Pass transistor, transmission gate.

Unit-II

VLSI Fabrication Techniques An overview of wafer fabrication, Wafer processing, Oxidation, Pattering, Diffusion, Ion implantation, Deposition, silicon gate NMOS process, CMOS processor, N well, P well, Twin-tub, Silicon on insulator, CMOS process enhancements interconnect circuit elements latch up, latch up triggering & prevention techniques.

Unit-III

MOS and CMOS Circuit Design Process-Layer representation, Stick diagrams, NMOS design style, CMOS design style, Design rules, Need for design rules, Mead Conway design rules for silicon gate NMOS process, CMOS n well/ p well based design rules simple layout examples, Sheet resistance estimation.
Capacitance estimation, Area capacitance, Wiring capacitance, Driving large capacitive loads.

Unit-IV

NMOS & CMOS Circuit and Logic Design, Switch logic, Pass transistor & Transmission gate, gate logic, inverter, two input NAND gate, NOR gate other form of CMOS logic, Dynamic CMOS logic Clocked CMOS logic, Precharged domino CMOS logic, Structured design, Simple combinational logic design examples, Parity generator, Multiplexers clocked sequential circuits, Two phase clocking, charge storage, Dynamic register element, NMOS and CMOS, Dynamic shift register, semi static register, J-K flip flop.

Unit-V

Subsystem Design Process
Design of a 4-bit shifter, general arrangement of 4 bit arithmetic processor, Design of a ALU system implementing ALU functions with an adder, carry look ahead adders, Multipliers, Serial parallel multipliers, Pipe lined multiplier array, Modified Booth's algorithm

References:

1. Douglas "A puchnel and Kamrah Eshraghian, Basic VLSI design, Prentice Hall of India.
2. Neil H.E. West and Kamrah Eshraghigm "Principle of CMOS VLSI design: A System perspective", Addison wisely.
3. Eugene D Fabricus " Introduction to VLSI design" McGraw Hill International.
4. Amar Mukherjee, "Introduction to NMOS & COMS VLSI design" Prentice Hall.
5. Wayne Wolf "Modern VLSI design- Systems on Silicon", Prentice Hall.
6. Carver Mead a Lynn Conway, "Introduction to VLSI Systems", Addison Wesley.

PROGRAMME : B.E. Electrical & Electronics Engineering,VII Semester
Course: EX7201 EHV A.C. and D.C. Transmission

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS - 4C			THEORY PAPERS
			L	T	P	
Departmental	EHV A.C. and D.C. Transmission	EX7201	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

COURSE CONTENTS

Unit-I

Constitution of EHV a.c. and d.c. links, Kind of d.c. links, Limitations and Advantages of a.c. and d.c. transmission, Principal application of a.c. and d.c. transmission, Trends in EHV a.c. and d.c. transmission, Power handling capacity. Converter analysis garetz circuit, Firing angle control, Overlapping.

Unit-II

FACTS devices, basic types of controller, series controller, static synchronous series compensator(SSSC), thyristor-controlled series capacitor(TCSC), thyristor controlled series reactor(TCSR), shunt controller (STATCOM), static VAR compensator(SVC), series-series controller, combined series-shunt controller, unified power flow controller(UPFC), thyristor controlled phase shifting transformer(TCPST).

Unit-III

Components of EHV d.c. system, converter circuits, rectifier and inverter valves, Reactive power requirements, harmonics generation, Adverse effects, Classification, Remedial measures to suppress, filters, Ground return. Converter faults & protection harmonics misoperation, Commutation failure, Multiterminal D.C. lines.

Unit-IV

Control of EHV d.c. system desired features of control, control characteristics, Constant current control, Constant extinction angle control. Ignition Angle control. Parallel operation of HVAC & DC system. Problems & advantages.

Unit-V

Travelling waves on transmission systems, Their shape, Attenuation and distortion, effect of junction and termination on propagation of traveling waves. Over voltages in transmission system. Lightning, switching and temporary over voltages: Control of lighting and switching over voltages

Reference:

1. S. Rao,- "EHV AC & DC Transmission" Khanna pub.
2. Kimbark,-" HVDC Transmission" john willy & sons pub.
3. Arrillaga,- "HVDC Transmission"2nd Edition ,IEE londan pub.
4. Padiyar, -"HVDC Transmission" 1st Edition ,New age international pub.
5. T.K. Nagsarkar,M.S. Sukhiza, -"Power System Analysis", Oxford University
6. Narain.G. Hingorani, l. Gyugyi-"Undustanding of FACTS concept and technology", john willy & sons pub.
7. P.Kundur- "H.V.D.C. Transmission" McGraw Hill Pub.

PROGRAMME: B.E. Electrical & Electronics Engineering, VII-Semester
Course: EX7202 Optical Communication

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE				THEORY PAPER
Departmental	Optical Communication	EX7202	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

COURSE CONTENTS

Unit-I

Introduction to optical communication principles of light transmission optical fiber modes and configurations, Mode theory for circular wave-guides, Single-mode fibers, Multimode fibers, Numerical aperture, Mode field diameter, V-number, fiber materials, Fiber fabrication techniques.

Unit-II

Optical sources, LED'S, LASER diodes, Model reflection noise, Power launching and coupling, population inversion, fiber splicing, optical connectors, Photo-detectors, PIN, Avalanche detector, Response time, Avalanche multiplication noise.

Unit III

Signal degradation in optical fibers, Attenuation losses, Signal distortion in optical wave guides, Material dispersion, Wave guide dispersion, Chromatic dispersion, Inter-modal distortion, Pulse broadening in Graded index fibers, Mode coupling, Advance fiber designs: dispersion shifted, Dispersion flattened, Dispersion compensating fibers, Design optimization of single mode fibers.

Unit-IV

Coherent optical fiber communication, Modulation techniques for Homodyne and Heterodyne systems, Optical filter link design. Rise time budget and link power budget, Long haul systems bit error rate, line coding, NRZ, RZ, Block Codes eye pattern.

Unit-V

Advance system and techniques, wavelength division multiplexing, optical amplifiers semiconductor amplifier, EDFA, Comparison between semiconductor and optical amplifier, Gain band width, Photonic switching, Optical Networks . Optical fiber bus, Ring topology, Star architectures, FDDI, SON-ET.

References:

1. Frams J. & V.K. Jam, Optical Communication Systems.
2. Ghatak A.K., & Thyagarajan, K., Optical Communication. TMH
3. Liu- Principles & Application of Optical Communication 1st ed., TMH
4. G. Keiser- Optical Fiber Communication 4th ed., TMH

PROGRAMME: B.E. Electrical and Electronics Engineering, VII-Semester

Course: EX7203 Computer Networks

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDIT-4C			THEORY PAPER
			L	T	P	
Departmental	Computer Networks	**EX7203**	3	1	0	**Max.Marks-100** Min.Marks-35 Duration-3hrs.

COURSE CONTENTS

Unit-I

Introduction to computer network, classification of networks (WAN, MAN, LAN), distributed systems, digital signals and data rates, bit stream, symbols and band rate, transmission media, modems, structure of computer network, circuit, packet, message switching topological design, back bone design OSI, reference model.

Unit-II

Physical and data link layer, bit communication between DTE and DCE, RS232C, novel modem Terminal handling, multiplexing and concentration data link layer service and design issues, errors detection and correction, retransmission strategies, sliding window protocols, satellite and packet radio networks, pure aloha protocols, slotted aloha protocol, satellite networks, reservation aloha protocol, DES, PCEM, packet radio networks.

Unit-III

Network layer, basic design issues, network layer services, connection oriented and connection less services, routing, static multipath, centralized isolated distributed hierarchical broadcast, flow based routing, congestion deadlocks radio concept of Ethernet LAN topology and architecture CSMA/CD protocol, token ring LAN token bus LAN, Fiber optic LAN principle of LAN bridges, transparent bridge source routing bridges, gateway, gateway design issues x25 internet working.

Unit-IV

ISDN, B-ISDN and ATM, evolution of ISDN, goal of ISDN services, ISDN system architecture and network terminating devices ISDN interface ISDN signaling, broad band ISDN, Asynchronomous transfer modem ATM adaptation layer, transport layer, OSI transport protocol, session layer designing issues, data exchange OSI session layer primitives, transport protocol TCP

Unit-V

Presentation layer, abstract syntax notation data compressed on oxyptography, application layer OST service elements ACSE and CCR, the transfer access and management, concurrence control nistual terminals, electronic mail directory services distributed systems, formal protocol modules, network management, mobile networking.

Unit-VI

Networking Equipments and Monitoring Tools Routers, Modems, Switches, Gateways, online networking monitoring tools, Network security, Proxy Server design.

References:

1. Tanenbum, Computer Networks, PHI.
2. Keizer, LANs.
3. Stalling W., Computer Networks, PHI.
4. ISDN & Broadband.
5. ISDN: Stalling W., PHI.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX801 Computer-Aided Design of Electrical Machines

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -6 C			THEORY PAPERS
Departmental	Computer-Aided Design of Electrical Machines	EX801	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	2	

Course Contents

Unit-I

Introduction: Design problem-Mathematical programming methods, computer aided design- Mathematical formulation of the problem. Programming techniques (LP & NLP only), Methods of solution, Unconstrained optimization problems, constrained optimization problems.

Unit-II

Optimal design of DC machine:-Design of armature, Windings and field systems, Selection of variables for optimal design, Formulation of design equations, Objective function, Constraint functions, Algorithms for optimal design.

Unit-III

Optimal design of power transformer:-Design of magnetic circuit, Design of windings, Selection of variables for optimal design, Formulation of design equations, Objective function, Constraint functions, Algorithms for optimal design.

Unit-IV

Optimal design for 3-phase alternator:-Design of stator, windings, Design of Field systems for salient pole and non-salient pole machines, Selection of variables for optimal design, Formulation of design equations, Objective function, Constraint functions, Algorithms for optimal design.

Unit-V

Optimal design of 3-phase induction motor:-Design of stator, Windings Design of squirrel cage rotor, Design of slip ring rotor, Selection of variables for optimal design, Formulation of design equations, Objective functions Constraint functions, Algorithms for optimal design.

References:

1. Computer- Aided Design of Electrical Equipment- by Dr. M. Ramamoorthy-Affiliated East-West press Pvt. Ltd. New Delhi.
2. Electrical Machine Design- by A.K. Sawhney, Dhanpat Rai & Sons.
3. Principles of Electrical Machine Design with Computer Programmes by- S.K. Sen, Oxford & IBH Publishing Co.
4. Performance and Design of A.C. Machines-M.G. Say, Affiliated East West Press Pvt. Ltd., New Delhi.
5. Performance and Design of D.C. Machines- Clayton & Hancock.

.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX802 Electrical Drives

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -6 C			THEORY PAPERS
Departmental	**Electrical Drives**	EX802	L	T	P	Max.Marks-100 Min.Marks-35
			3	1	2	Duration-3hrs.

Course Contents

Unit-I

Control of D.C. motors by converters:- Introduction to Thyristor Controlled Drives, single phase semi and fully controlled converters and three semi and fully controlled converters connected to d.c. separately excited and d.c. series motors-continuous current operation, Output voltage and current waveforms, Speed and Torque expression, Speed-Torque Characteristics, Problems on converter fed d.c. motors.

Unit-II

Four quadrant operation of D.C. Drives.: Introduction to Four quadrant operation, Motoring operations, Electric braking, Plugging, dynamic and regenerative braking operations. Four quadrant operation of D.C. motor by Dual converters-Closed loop operation of DC motor (Block diagram only)Control of D.C. Motors by Choppers:-Single quadrant, Two-quadrant and four quadrant chopper fed d.c. separately excited and series excited motors, Continuous current operation, Output voltage and current waveforms-Speed torques expressions-Speed torque characteristics, Problems on Chopper fed d.c. motors, Closed loop operation (Block diagram only)

Unit-III

Control of Induction Motors on stator side:-Control of Induction Motor by AC Voltage controllers-Waveforms, Speed torque characteristics, Variable frequency control of induction motor by Voltage Source, Current Source inverters and cycloconverters, PWM control Comparison of VSI & CSI operations, Speed-torque Characteristics, Numerical problems on induction motor drives, Closed loop operation of induction motor drives. (Block diagram only)

Unit-IV

Control of Induction Motors from rotor side:-Static rotor resistance control, Slip power recovery static Scherbius Drive, Static Kramer Drive, Their performance and speed torque characteristics advantages-application-problems.

Unit-V

Control of Synchronous Motors:- Separate control & Self control of synchronous motors, Operation of self controlled synchronous motors by VSI, CSI and Cycloconverters. Load commutated CSI fed Synchronous motor, Operation, Waveform, Speed torque Characteristics, Application, Advantage, Numerical problems, Closed loop operation os synchronous motors drives. (Block diagram only)

References:

1. G.K. Dubey “Fundamentals of Electrical Drives”-. Narosa Publications
2. Gopal K. Dubey “Power semiconductor Controlled Drives”- PHI
3. S.B. Dewan, G.R. Slemon, A. Straughen “Power semiconductor Controlled Drives”
4. B.K. Bose “Power Electronic control of AC Drives”.
5. V. Subramanyam “Thyristor control of Electric Drive” Tata Mc Graw Hill Pub
6. N.K. De , P.K. Sen “Electric Drives” PHI
7. S.K. Pillai, “A first course of Electrical Drive” New age International.
8. S.K. Pillai. “Analysis of Thyristor Power conditioned Motors” University Press (India)Ltd. Longman
9. P.V. Rao, “Power semiconductor Drives”, BS Publications.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8301 Power Quality

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
	Power Quality	EX8301	L	T	P	Max.Marks-100 Min.Marks-35
			3	1	0	Duration-3hrs.

Course Contents

UNIT-I

Introduction, power quality -voltage quality, power quality evaluations procedures term and definition: general classes of power quality problem, causes & effect of power quality disturbances.

UNIT-II

Voltage sags and interruption: sources of sags and interruption, estimating voltages sag performance, fundamental principles of of protection, monitoring sags.

UNIT-III

Transients over voltages: sources of transient over voltages, principles of over voltages protection, utility capacitor switching transients, fundamentals of harmonics and harmonics distortion, harmonics sources from commercial load and from industrial loads.

UNIT-IV

Applied harmonics : harmonics distortion evalutions, principles for controlling harmonics, harmonics studies devices for controlling harmonic distortion, filters, passive input filter standards of harmonics.

UNIT-V

Electro-magnetic compatibility, constant frequency control, constant tolerance band control, variable tolerance band control, discontinuous current control.

Reference Books:

1. Power Quality- by R.C. Duggan
2. Power System harmonics –by A.J. Arrillga
3. Power electronic converter harmonics –by Derek A. Paice

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8302 Advanced Communication Systems.

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
			L	T	P	
Departmental	Advanced Communication Systems.	EX8302	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

Course Contents

Unit-I

Introduction to spread spectrum modulation, Direct sequence (DS) spread spectrum, Spread spectrum with code division multiple access (CDMA), Ranging, Frequency hopping (FH) spread spectrum, PN sequence generation, Acquisition and tracking of FH signal and DS signals.

Unit-II

Satellite communication: Introduction to satellite communication, Frequency allocation active/passive synchronous ,Non synchronous systems, Orbits satellite attitude, Transmission path, Path loss, noise consideration link analysis, Satellite systems effective isotropic radiated power, Multiple access methods, Earth stations, Tracking and servo system, Up-down converters, Example of satellite systems.

Unit-III

Digital switching systems: Introduction to electronics and digital exchanges, Hierarchy of switching offices, Common control push button dialing systems, Switching matrix multiple stage switching time division multiplexing time slot interchanging (TSI), Comparison of TSI with space switching, Space array for digital signals, Combined space and time switching. Principles of FAX.

Unit-IV

Mobile communication: Introduction to cellular mobile communication element of the cellular systems, Cell design, hand off techniques, Frequency Management.

Unit-V

Local access networks: Improvement in convention cables: XDSL, ADSL, Wireless local loop, Fiber in local loop, radio Trunking. ISDN: Architecture, Services and Protocols, ATM networks

References:

1. Radio Callins, Microwave communication.
2. Gagldardi, Satellite communication.
3. Thyggajan Vishwanathan, Digital switching systems.
4. Lee, Cellular and mobile communication
5. Karmile Fresher, Wireless digital communication.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8303 Fuzzy Logic & Neural Network

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental	Fuzzy Logic & Neural Network	EX8303	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Course Contents

Unit-I

Fuzzy system introduction, Fuzzy relation, Membership function, Fuzzy matrices and entropy, Fuzzy operation and composition.

Unit-II

Fuzzy Variables, Linguistic variables, measures of fuzziness, concepts of defuzzification, Fuzzy control applications.

Unit-III

Fundamentals of Artificial Neural networks- Biological prototype – Artificial neuron, Activation functions, Single layer and multiplayer networks. Training Artificial neural networks, Preceptrons, Exclusive Or Problem – Linear seperability, Storage efficiency, Preceptron learning, perceptron training algorithms.

Back propagation, Training algorithm, network configurations, Network paralysis, Local minima, temporal instability.

UNIT-IV

Counter propagation networks, Kohonen layer, Training the kohonen layer, Pre processing the inputted vectors, Initialising the wright vectors, Statistical properties, Training the grosberg layer. Full counter propagation networks, Applications.

Statistical methods, Boltzman training, Cauchy training, Artificial specific heat methods, Applications to general non-linear optimization problems. Back propagation and cauchy training.

UNIT-V

Hopfield nets, Recurrent networks, Stability, Associative memory, Thermodynamic systems, Statistical Hopfiled networks, Applications. Bi-directional associative memories, Retrieving on stored association, Encoding the associations.

References :

1. Laurence Fausett “Fundamentals of Neural Networks”, Prentice Hall.
2. Zmmermann H.J. “Fuzzy Set Theory and its Applications”, Allied Publishers Ltd.
3. Klir G.J. and Folger T., “Fuzzy Sets, Uncertainty and Information”, Prentice Hall.
4. Limin Fu. “Neural Networks in Computer Intelligence”, McGraw Hill.
5. Zuroda J.M. “Introduction to Artificial Neural Systems”, Jaico Publishing.
6. Haykin S. “Artificial Neural Network: A Comprehensive Foundation” Asia Pearson Pub.
7. Sivanandam & Deepa- An Introduction to Neural Networks using Matlab 6.0 1st ed., TMH
8. M.Amirthavalli, Fuzzy logic and neural networks, Scitech publications.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8401 SOFT COMPUTING TECHNIQUES AND APPLICATIONS

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental Electives	SOFT COMPUTING TECHNIQUES & APPLICATIONS	EX8401	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Course Contents

UNIT-1

Review of probability theory: Random variable, distribution functions , function of random variable. generation of random digit, and random variants from various distribution function, Monte Carlo simulation, sampling distributions station evolution using MCS, confidence interval, coefficient of variation.

UNIT-2

Evolution ANN, artificial neurons, activation functions, general network structure, δ- rule, and back propagation rule of training, RBF and FLN network.

UNIT-3

Draw back of classical optimization techniques, genetic algorithm; binary and real parameter GA, constraints handling in GA.

UNIT-4

Evolution strategies(ES), two members non-recombinative ES, multi member ES, recombinative ES. Optimization based on swarm intelligence particle, swarm optimization and its variants .

UNIT-5

Application of soft computing techniques to problem of electrical engg. E.g. economic dispatch, reliable optimization, ANN traing using evolutionary algorithms.

References :

1. R.Y. Rubinstein Simulation and the Monte Carlo method, John Wiley & sons 1st Edition.
2. Paul. L. Mayer-Introducing probability and statical application, Addition Weslay.
3. Rajasekaran and pai- Neural Network, Fuzzy logic & Genetic Algorithms. PHI Learing
4. LiMin. Fu, Neural Networks in Computer Intelligence, 9th Reprint TMH
5. Multi objective optimization using evolutionary algorithm- Kalyanmoy Deb John Wiley & Sons Ltd.
6. Probability and Random processes for Electrical Engineering , Alberto Leon Garcia IInd Pearson .
7. Principles of soft computing- S N Shivanandan, S N Deepa Wiley India (P) Ltd, I edition 2007.
8. Hand book of genetic algorithm- Rajaserkharans, vijaya laxmi pai.
9. PSO Tutorial- Kennedy Ebuehart.
10. Sivanandam & Deepa- An Introduction to Neural Networks using Matlab 6.0 1st ed., TMH
11. M.Amirthavalli, Fuzzy logic and neural networks, Scitech publications.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8402 Digital Electronics & Logic Design-II

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
Departmental	Digital Electronics & Logic Design –II	EX8402	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Course Contents

Unit I

Specification of sequential systems: Characterizing equation & definition of synchronous sequential machines. Realization of Floatable from verbal description, Mealy and Moore model machines state table and transition diagram. Minimization of the flow table of completely and incompletely specifies sequential machines

Unit II

High level description and specification of standard combinational & sequential modules and introduction to VHDL Programming. Concept of iterative arrays.

Unit III

Secondary state assignments in sequential machine; parallel & serial decomposition of equential machines. Introduction to asynchronous sequential machine, races and hazards. Information loss-less machine.

Unit IV

Algorithmic state machine and fundamental concept of hardware / firmware algorithms. Controllers and data system designing.

Unit V

Concept of PROM, PLE and FPLA. PALASM / XYLINGS software applications.
Other PLD devices like EPLA, GAL, PHEEL, Mega PAL and Hard Array Logic.

Books :

1. Z. Kohavi “Switching & Finite Automata Theroy” TMH.
2. S. C. See “Digital Circuits and Logic Design” PHI,
3. M.K. Ercegovac & T. Lang, “Digital Systems and Hardware/Firmware Algorithms” John Wiley.
4. Stefan Sjoholm & Lennart Lind “VHDL for Designers” Prentice-Hall.
5. P.J. Ashenden “The Designers Guide to VHDL” Harcourt Asia PTE Ltd. M. Ercegovac et.al “ Introduction to Digital Systems”
6. M. Mano “Digital Design” John Wiley & Sons, PHI.
7. P.K. Laia “Digital System Design using Programmable logic Devices” Prentice Hall
8. K.L.Short “Microprocessors and Programmed Logic” PHI.
9. Z. Navatri “ VHDL Analysis & Modeling of Digital Systems” Mc-Graw Hill.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX8403 Digital Image Processing

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -4 C			THEORY PAPERS
			L	T	P	
Departmental	Digital Image Processing	EX8403	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

COURSE CONTENTS

Unit-I

Digital Image Processing-Elements of a Digital Image Processing system, Structure of the Human eye, Image formation and contrast sensitivity, Sampling and Quantization, Neighbours of a pixel, Distance measures, Photographic file structure and exposure, Filem characteristics, Linear scanner, Video camera, Image processing applications.

Unit-II

Image Transforms- Introduction to Fourier transform-DFT, Properties of two dimensional FT, Separability, Translation, Periodicity, Rotation, Average value, FFT algorithm, Walsh transform, Hadamard transform, Discrete Cosine transform.

Unit-III

Image Enhancement- Definition, Spatial domain methods, Frequency domain methods, Histogram modification technique, Neighborhood averaging, Media filtering, Lowpass filtering, Averaging of multiple images, Image sharpening by differentiation and high pass filtering.

Unit-IV

Image Restoration-Definition, Degradation model, Discrete formulation, Circulant matrices, Block circulant matrices, Effect of diagnolization of circulant and block circulant matrices, Unconstrained and constrained restorations , Inverse filtering, Wiener filter, Restoration in spatial domain.

Unit-V

Image Encoding-Objective and subjective fidelity criteria, Basic encoding process, The mapping, The quantizer, The coder, Differential encoding, Contour encoding, Run length encoding, Image encoding relative to fidelity criterion, Differential pulse code modulation.

Unit-VI

Image Analysis and Computer Vision- Typical computer vision system, Image analysis techniques, Spatial feature extraction, Amplitude and Histogram features, Transform features, Edge detection, Gradient operators, Boundary extraction, Edge linking, Boundary representation, Boundary matching, Shape representation.

References:

1. Rafael, C. Gonzlez., and Paul, Wintz, “Digital Image Processing”, Addison-Wesley Publishing Company.
2. Jain Anil K., “Fundamentals of Digital Image Processing”, Prentice Hall.
3. Sosenfeld, and Kak, A.C., “Digital Image Processing”, Academic Press.
4. William K. Pratt., “Digital Image Processing”, John Wiley and Sons.

PROGRAMME: B.E. Electrical & Electronics VIII-Semester
Course: EX803 Major Project

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDIT-8C			PRACTICAL EXMN.
			L	T	P	
Departmental	**Major Project**	EX803	0	0	8	Max.Marks-100 Min.Marks-50

COURSE GUIDELINES

The objectives of the course 'Major Project' are

- To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
- To adapt students for latest developments and to handle independently new situations.
- To develop good expressions power and presentation abilities in students.

The focus of the Major Project is on preparing a working system or some design or understanding of a complex system using system analysis tools and submit it the same in the form of a write-up i.e. detail project report. The student should select some real life problems for their project and maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan. Each student is required to prepare a project report and present the same at the final examination with a demonstration of the working system (if any).
The faculty and student should work according to following schedule:
i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.

ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
iii) At all the steps of the project, students must submit a written report of the same.

PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX804 Industrial Project

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -2 C			PRACTICAL EXAM
Departmental	Industrial project	EX804	L	T	P	Max.Marks-50 Min.Marks-25 Duration-3hrs.
			0	0	2	

Concept and guideline

Student will under take a small project which will pertain to live problems of Industry\ Community. The project may be related to use of technology in industry or transfer of technology to introduce value addition for agriculture, improving health & hygienic, energy management & conservation, optimal use of local resources or in the new product areas.

The student can undertake project singly or in a batch (of not more than five students). At the end of project student will submit a project report which will contain details of the problem identified and solution suggest for it.