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.

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PROGRAMME : BE Electrical & Electronics Engineering-VIII Semester

Course: EX802 Electrical Drives

CATEGORY OF COURSE	COURSE TITLE	COURSE CODE	CREDITS -6 C			THEORY PAPERS
			L	T	P	
Departmental	**Electrical Drives**	EX802	3	1	2	Max.Marks-100 Min.Marks-35 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
			L	T	P	
Departmental	Digital Electronics & Logic Design –II	EX8402	3	1	0	Max.Marks-100 Min.Marks-35 Duration-3hrs.

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. Lala “Digital System Design using Programmable logic Devices” BS Publication
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
Departmental	Digital Image Processing	EX8403	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

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
			L	T	P	
Departmental	Industrial project	EX804	0	0	2	Max.Marks-50 Min.Marks-25 Duration-3hrs.

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.