Project:
The objective of the project is to enable the students to work in groups of not more than six members in each group on a project involving analytical, experimental, design or combination of these in the area of Electrical Engineering. Each project shall have a guide. The student is required to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. On completion of the work, a project report should be prepared and submitted to the department. The evaluation is based on continuous internal assessment by an internal assessment committee for 75 marks. The university examination, which carries a total of 75 marks, will be a Viva Voce examination at the end of VIII Semester, conducted by a committee of one external examiner appointed by the University and one internal examiner/Guide.

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SYLLABUS OF VII & VIII SEMESTER B.E (ELECTRICAL ENGG.) (C.B.C.S.)

SEMESTER SEVENTH

7EE01 / 6EPO3 ELECTRICAL ENERGY DISTRIBUTION &UTILIZATION

Course Outcomes:
After completing this course, Students will be able to:

1. Demonstrate the knowledge of distribution substation
2. Compare different power distribution systems
3. Describe elements of distribution Automation system
4. Select proper electrical drive for industrial applications
5. Explain the workingof electric traction system
6. Describe an illumination system & electric heating

Unit I: Substation: Selection & location of site, classification, major equipment ,graphical symbols for various apparatus & circuit elements ,key diagram for 33/11kV substation along with selection & specification of substationequipment, types of bus-bar arrangements, substation earthing. Introduction to Gas Insulated Substation (GIS).

Unit II: Power distribution system -I: Primary and secondary distribution, types of conductors in Distribution system, comparison of distribution systems radial, parallel and ring main, economics of feeder design.

Unit III: Power distribution system - II: Methods for reduction of line losses in distribution system. Introductionto High Voltage Distribution System (HVDS). Distribution Automation: Need for distribution automation, feederautomation, and communication requirements for Distribution automation, Remote terminal unit (RTU).Introduction to SCADA systems.

Unit IV: Electrical Drives: Concept, types, selection criterion for electrical drive. Types of duties, rating calculations for these duties. Heating and cooling. Industrial applications: Textile mill, Cement mill, Sugar mill.

Unit V: Traction System: Requirement, speed- time curves. General features, types, Quadrantal diagram of speed torque characteristics of traction motors. Control of traction motors: Series-Parallel control. Different accessories fortrack electrification ï overhead wires, conductor rail system, current collector-pantograph

Unit VI: Illumination: Street lighting**:** Principle, illumination level, mounting height of lamps, spacing, types oflamps. Flood lighting: Flood lighting calculations, waste light factor, Depreciation factor, Utilization factor.
LED:Working principle, advantages & applications.
b) **Electric Heating**:Resistance& Induction heating & its applications.

Text Books:
1. S.K.Pillai, ñA First Course on Electrical Drivesò, New Age International Publication
2. J.B.Gupta, ñA Course in Power Systemò, S.Chand Publication.

Reference Books:
1. M.V.Deshpande, ñElectrical Power System Designò, TMH Publishing Company Ltd
2. S.Sivanagaraju & S.Satyanarayana, ñElectric Power Transmission & Distributionò Pearson Publication
3.P. S. Satnam&P.V.Gupta, ñSubstation design & Equipmentò Dhanpat Rai Publication.
4. J.Upadhyay&S.N.Mahendra : Electric Traction by Allied Publishers Ltd
5. J.B.Gupta :Utilization of Electric Power & Electric Traction by S.K.Kataria& Sons, New Delhi.
6. H.Pratap :Art& Science of Utilization of Electrical Energy by Dhanpat Rai& Company Ltd.
7. H Pratap, ñModern Electric Tractionò Dhanpat Rai& Sons Ltd
8. Dr.M.K.Khedkar&Dr.G.M.Dhole : A Textbook of Electrical Power Distribution Automation by University Science Press
9. S.L.Uppal: Electrical Wiring, Estimating and Costing by Khanna Publishers.

7EE02 DIGITAL SIGNAL PROCESSING

Course Outcomes: After successful completion of this course, students will be able to:

1. Analyze the discrete time signals in time domain.
2. Analyze the discrete time systems using DTFT and DFT.
3. Apply the concept of Bandpass sampling.
4. Design the structures of different types of digital filters.
5. Analyze the frequency response of various digital filters.
6. Apply the knowledge of multi-rate signal processing.

Unit I:
Introduction to DSP, Frequency domain description of signals &systems, Discrete time sequences systems, Linearity unit sample response, Convolution, Time invariant system, Stability criteria for discrete time systems, Solutions of linear difference equations.

Unit II:
Fourier Transform**:** Introduction to Fourier transform of Discrete Time Signal and its properties, Inverse Fourier transform, DFT and its properties, Circular convolution, Linear convolution from DFT, FFT, decimation in time and frequency algorithm.

Unit III:
Sampling of Bandpass signals, Representation of Bandpass signals, sampling of Bandpass signals, discrete time processing of continuous time signal; Analog to digital conversion-sample and hold, quantization and coding, analysis of quantization errors, oversampling of A/D converter; Digital to Analog conversion sample and hold, first order hold, linear interpolation with delay, oversampling of D/A converter.

Unit IV:
Filter categories, Direct form I, Direct form II, Cascade and parallel structure for IIR and FIR Filter, Frequency sampling structures for F.I.R. filter, Steps in Filter Design, Design by Pole Zero Placements, FIR filter design by Windowing Method, Rectangular, Triangular and Blackman window

Unit V:
Analog filter types, Butter worth, Elliptic filter, Specification and formulae to Decide to filter order, Methods to convert analog filter into IIR digital, Mapping of differential, Impulse Invariant, Bilinear, Matched Z transformation.

Unit VI:
Multirate DSP and Introduction to DSP Processor, Decimation by a factor D, interpolation by a factor I, sampling rate conversion by a rational factor I/D, Filter Design & Implementation for sampling rate conversion, Multi stage Implementation of sampling rate conversion. General Architecture of DSP, Case Study of TMS320C67XX.

Books Recommended:

Text Books:

1. J. G. Proakis and D. G. Manolakis, ñDigital Signal Processing: Principles, Algorithm and Applicationsò, (4th Edition), Prentice Hall, 2007
2. N. J. Fliege, ñMultirate Digital Signal Processing: Multirate Systems - Filter Banks ï Waveletsò, (1st Edition), John Wiley and Sons Ltd, 1999.

Reference Books:

1. S. K. Mitra, ñDigital Signal Processingò, 3rd Edition, TMH Edition.
2. Ifaeachor E.C, Jervis B. W., ñDigital Signal Processing: A Practical Approachò, Pearson Publication
3. S. K. Mitra, ñDigital Signal Processing: A Computer Based Approachò, McGraw Hill, 2011.

7EE03 ENTREPRENEURSHIP AND PROJECT MANAGEMENT

Course Outcomes:

After successful completion of this course, students will be able to:

1. Understand the concept of entrepreneurship and its role in economic development.
2. Compare the various business models and select the most suitable.
3. Identify&formulate the project report and Source of finance for a project.
4. Estimate the cost, time & resources for the project work.

Unit I:

Entrepreneurship: Introduction to Entrepreneurship, Meaning and concept of entrepreneurship, Need of Entrepreneurship, Types of Entrepreneurships-Social, For Profit, Not for Profit, the Evolution history of entrepreneurship development, role of entrepreneurship in economic development, Institutions/agencies for entrepreneurship development, future Scope of entrepreneurship, Entrepreneurial Ecosystem.

Unit II:
Entrepreneur: Entrepreneur: Who? Why? How? the Attributes, skills/traits required to be an entrepreneur; Creative and Design Thinking, types of entrepreneurs. Myths and Realities about entrepreneurs, the entrepreneurial decision process, and skill gap analysis, and Entrepreneurial models, entrepreneurial success stories, Pitching for Start-ups, Marketplace, Marketspace.

Unit III:
Business Model & Business Organization: Types of Business Models; its importance, Business Plan: Importance, Guidelines and Contents, Specimen of a B-Plan and Feasibility Studies, pre- requisites from the perspective of investor. The importance and diversity of business model, components of an effective business model Canvas, Various form of business organization-sole proprietorship, partnership, corporations, Limited Liability Company.

Unit IV:
Project Management: Basic concepts & Planning: Life Cycle of a Project. The Steps in managing a Project.International Standards (PMI, IPMA). Different types of projects: industrial, research and more. The role of the Project Manager.Terms of the Project Contract.Project Planning.Goals and Objectives of the Project.Owners and Stakeholder. The Work Breakdown Structure (WBS) to plan a project.

Unit V:
Project identification & Evaluation: Selection - project formulation ï contents of a project report - planning commission, guidelines for formulating a project - specimen of a project report. Source of finance for a project - Institutional finance supporting projects, project evaluation - objectives - types - methods.

Unit VI:
Time and Cost Management: Estimation of Time, Costs and Resources. Scheduling Project Work.Critical Path Method (CPM).Resource balancing. Defining Project Risks. Process to establish the project risk plan. Contingency Reserves. Risk Matrix Analysis. Project Control and Evaluation.

BOOKS RECOMMENDED:

Text Books:
1. S. S. Khanka, ñEntrepreneurial Developmentò, S. Chand and Company Limited, New Delhi, 2001.
2. Dr. C. B. Gupta, Dr. N.P. Srinivasan, ñEntrepreneurial Developmentò, Sultan Chand & Sons.

Reference Books:
1. S. Choudhury, "Project Management*", Tata McGraw Hill Education Private Limited, 2009.*
2. Denis Lock, ñProject Managementò, Gower Publishing Company, USA.

7EE04 PROFESSIONAL ELECTIVE-III

(i) WIND AND SOLAR SYSTEMS

Course Outcomes:
After successful completion of this course, students will be able to:

1. Understand the energy scenario and the consequent growth of the power generation from renewable energy sources.
2. Understand the basic physics of wind and solar power generation.
3. Understand the power electronic interfaces for wind and solar generation.
4. Understand the issues related to the grid-integration of solar and wind energy systems.

Unit I:
Physics of Wind Power: History of wind power, Indian and Global statistics, Wind physics, Betz limit, Tip speed ratio, stall and pitch control, Wind speed statistics-probability distributions, Wind speed and power-cumulative distribution functions.

Unit II:
Wind Generator Topologies: Review of modern wind turbine technologies, Fixed and Variable speed wind turbines, Induction Generators, Doubly-Fed Induction Generators and their characteristics, Permanent-Magnet Synchronous Generators, Power electronics converters. Generator - Converter configurations, Converter Control.

Unit III:
The Solar Resource: Introduction, solar radiation spectra, solar geometry, Earth Sun angles, observer Sun angles, solar day length, Estimation of solar energy availability.

Unit IV:
Solar Photovoltaic: Technologies-Amorphous, mono crystalline, polycrystalline, V-I characteristics of a PV cell, PV model, array, Power Electronic Converters for Solar Systems, Maximum Power Point Tracking (MPPT) algorithms. Converter Control.

Unit V:
Network Integration Issues: Overview of grid code technical requirements. Fault ride-through for wind farms - real andreactive power regulation, voltage and frequency operating limits, solar PV and wind farmbehaviour during grid disturbances. Power quality issues. Power system interconnectionexperiences in the world. Hybrid and isolated operations of solar PV and wind systems.

Unit VI: Solar Thermal Power Generation:
Technologies, Parabolic trough, central receivers, parabolic dish, Fresnel, solar pond, Elementary analysis.

Books Recommended:

Text Books:

1. T. Ackermann, ñWind Power in Power Systemsò, John Wiley and Sons Ltd., 2005.
2. S. P. Sukhatme, ñSolar Energy: Principles of Thermal Collection and Storageò, McGraw Hill, 1984.

References Books:

1. G. M. Masters, ñRenewable and Efficient Electric Power Systemsò, John Wiley and Sons, 2004.
2. H. Siegfried and R. Waddington, ñGrid integration of wind energy conversion systemsò, John Wiley and Sons Ltd., 2006.
3. G. N. Tiwari and M. K. Ghosal, ñRenewable Energy Applicationsò, Narosa Publications, 2004.
4. J. A. Duffie and W. A. Beckman, ñSolar Engineering of Thermal Processesò, John Wiley & Sons, 1991.

7EE04 PROFESSIONAL ELECTIVE - III
(ii) VLSI DESIGN

Course Outcomes:

1. Identify the various IC fabrication methods.
2. Express the Layout of simple MOS circuit using Lambda based design rules.
3. Apply the Lambda based design rules for subsystem design.
4. Differentiate various FPGA architectures. CO5: Design an application using Verilog HDL.
5. Concepts of modelling a digital system using Hardware Description Language

Unit-I : VLSI and Mooreôs Law. CMOS technology. Hierarchical design. The VLSI design process. IP-based design. Fabrication methods.Transistor structures. Characteristics of transistors and wires. Design rules. Layout design. Reliability.

Unit-II : Combinational logic. Static logic gates. Basic Gate Layout. Delay and power consumption .Alternate gate structures: switch, domino. Wire delay models. Design-for-yield. Gates as IP.

Unit III : Combinational Logic Networks: Layouts for logic networks. Delay through networks. Logic and interconnect design. Power consumption and power optimization. Switch logic networks. Combinational logic testing.

Unit-IV: Sequential Machines: Latches and flip-flops. structures and Clocking disciplines. Performance analysis. Sequential system design. Power optimization. Verification and testing of FSMs

Unit-V : Subsystems Design: Pipelines and data paths. Adders. Multipliers. Memory. PLAs.FPGAs. Image sensors. Buses and networks-on-chips. Data paths.

Unit-VI: Floor planning: Floor planning styles and methodology. Global routing. Clock distribution. Power distribution. Packaging and pads. Register-transfer design. Pipelining. High-level synthesis.

Text Book: Wayne Wolf: ñModern VLSI Designò, Prentice-Hall.

Reference Books:

1. Vai M.M. ñVLSI Designò, CRC Press.
2. Weste N, Eshraghian, ñPrinciples of CMOS VLSI Designò Pearson Education.
3. Chandrasetty V A ñVLSI Designò, Springer.
4. Esteban Tlelo-Cuautle and Sheldon X.-D. Tan, ñVLSI Designò, InTech, Croatia

7EE04 PROFESSIONAL ELECTIVE-III -
(iii) Computer Architecture & Organization

Course Outcomes:

1. Differentiate Von Neumann, Harvard, and CISC and RISC architectures. Analyze the performance of machines with different capabilities.
2. Illustrate binary format for numerical and characters. Validate efficient algorithm for arithmetic operations.
3. Construct machine level program for given expression on n-address machine. Analyze and calculate memory traffic for a program execution. Design an efficient data path for an instruction format for a given architecture.

4. Explain the importance of hierarchical memory organization. Able to construct larger memories. Analyze and suggest efficient cache mapping technique and replacement algorithms for given design requirements. Demonstrate hamming code for error detection and correction.
5. Understand the need for an interface. Compare and contrast memory mapping and IO mapping techniques. Describe and Differentiate different modes of data transfer. Appraise the synchronous and asynchronous bus for performance and arbitration.
6. Understand the structure and read write mechanisms for different storage systems. Illustrate and suggest appropriate use of RAID levels. Assess the performance of IO and external storage systems.
7. Classify parallel machine models. Illustrate typical 6-stage pipeline for overlapped execution. Analyse the hazards and solutions

Unit I: Introduction and overview of computer Architecture :
Introduction to computer systems - Overview of Organization and Architecture ï Functional components of a computer -Registers and register files-Interconnection of components Organization of the von Neumann machine and Harvard architecture-Performance of processor

Unit **II: Data Representation and Computer Arithmetic:**
Fixed point representation of numbers-algorithms for arithmetic operations: multiplication (Booths, Modified Booths) - division (restoring and non-restoring) - Floating point representation with IEEE standards and algorithms for common arithmetic operations- Representation of non-numeric data (character codes).

Unit III: Fundam**entals of Computer Architecture:**
Introduction to ISA (Instruction Set Architecture)-Instruction formats- Instruction types and addressing modes-Instruction execution (Phases of instruction cycle)- Assembly language programming-Subroutine call and return mechanisms-Single cycle Data path design-Introduction to multi cycle data path-Multi cycle Instruction execution.

Unit **IV Memory System Organization and Architecture:**
Memory systems hierarchy-Main memory organization-Types of Main memory-memory interleaving and its characteristics and performance- Cache memories: performance considerations. Virtual memories, address translation, memory management requirements.

Unit: V Interfacing and Communication:
I/O fundamentals: handshaking, buffering-I/O techniques: programmed I/O, interrupt-driven I/O, DMA- Interrupt structures: vectored and prioritized-interrupt overhead- Buses.

Unit: VI Device Subsystems:
External storage systems-organization and structure of disk drives: Electronic- magnetic and optical technologies-RAID Levels- I/O Performance. Performance Enhancements -
Classification of models - Flynns taxonomy of parallel machine models (SISD, SIMD, MISD, MIMD),Computer Peripherals: Input-output devices like video displays, online storage device, graphics input devices, Printers, scanner.

Text Book(s) :
1. David A. Patterson and John L. Hennessy Computer Organization and Design-The Hardware/Software Interface 5th edition, Morgan Kaufmann, 2013.
2. Carl Hamacher, ZvonkoVranesic, SafwatZaky, Computer organization, McGraw Hill, Fifth edition, Reprint 2011.

Reference Book:
1. W. Stallings, Computer organization and architecture, Prentice-Hall, 8th edition, 2013
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

7EE05 PROFESSIONAL ELECTIVE-IV
(i) ARTIFICIAL INTELLIGENCE

Course Outcomes: After successful completion of this course, students will be able to:

1. To understand and communicate fundamentals of Artificial Neural Networks and Systems.
2. To understand and present various learning methods and architectures of neural network.
3. To understand and describe fuzzy logic and genetic algorithm fundamentals and be able to solve problems.
4. To apply AI techniques to solve electrical engineering problems along with inter disciplinary problems.

Unit I: Introduction: Biological Neurons and their artificial models, introduction to neural computing Components of neuron, input and output weight, threshold, weight factors, transfer Functions, concepts of supervised and unsupervised learning.

Unit II: Supervised Learning: Single Layer network, perceptron, Linear Separability, Training algorithm and limitations Multilayer Network: Architecture of feed forward network, learning rule, generalized Delta rule, learning function. Back propagation algorithm.

Unit III: Unsupervised Learning: Introduction, Counter propagation networks, Korhonenôs self-organizing maps, Hopfieldôs networks.

Unit IV: Introduction to Fuzzy: Uncertainty in information, basic concepts of Fuzzy sets, operations on fuzzy sets, properties. Fuzzy relations: operations, properties, value assignments.

Unit V: Membership Functions: Features, fuzzification, membership value assignments, Fuzzy Rule based Systems, Graphical technique of inference. Defuzzification: Lambda-cuts for Fuzzy sets and Fuzzy relations, Defuzzification methods.

Unit VI: Genetic Algorithm (GA): Introduction to genetic algorithm, workingprinciple, coding of variables, Fitness function. GA operators, similarities & differences between GAs and Traditional methods; Unconstrained and constrained optimization using Genetic Algorithm, real coded GA, Advanced GA, global optimization using GA.

Books Recommended:

Text Books:

1. J.M. Zurada, ñIntroduction to Artificial Neural Networkò, Jaico Publishing House.
2. T J Ross, ñFuzzy Logic with Engineering Applicationò, Wiley Publication.

Reference Books:

1. G. J. Khir and T. A. Folger, ñFuzzy sets, Uncertainty and Informationò, PHI Publication.
2. Koska Bart, ñNeural Network & Fuzzy systemsò, Prentice Hall of India Pvt Ltd, New Delhi.
3. MeherotraKishan, Mohan C. K., Ranka Sanjay, ñElements of Artificial Neural Networksò, Penram International Publishing (India) Pvt. Ltd.
4. D. E. Goldberg, ñGenetic Algorithm in Search Optimization and Machine Learningò, Addison-Wesley Longman Publishing Co., US.
5. Kalyanmoy Deb, ñOptimization for Engineering Design Algorithms and Examplesò, Prentice Hall of India, New Delhi.

7EE05 PROFESSIONAL ELECTIVE-IV
(ii) ELECTRICAL DRIVES & CONTROL

Course Outcomes: After successful completion of this course, students will be able to:

1. Explain the basic Concept of electrical drives
2. Demonstrate various modern speed, torque control techniques of DC drives
3. Demonstrate various modern speed, torque control techniques of AC drives.

Unit I: Introduction to Electrical Drives: Overview of electrical drive, comparison of DC & AC drive, components of load torque. Stability of an electrical drive.Introduction to frame of references (synchronous and rotating), Park and Clark transformation.

Unit II: DC Drive Control: Introduction to Four quadrant operation of dc drive, reviewof principle of operation of the chopper, four quadrant chopper circuit operation. Steady state analysis of chopper-controlled DC motor drive: continuous and discontinuous current conduction. Closed loop speed controlled separately excited dc motor drive.

Unit III: AC Drive Control: Review of basic principle of operation, speed control of induction motor: Impact of rotor resistance of the induction motor torque--speed curve. Review of slip energy recovery scheme. Closed loop control of slip energy recovery-controlled induction motor drive. Power electronic based rotor side control of slip ring Induction motor.

Unit IV: Scalar Control of Induction Motor: overview of three-phase voltage source inverter, generation of three-phase PWM signals, sinusoidal modulation, space vector theory, conventional space vector modulation, voltage fed inverter control: open loop v/f control, close loop speed control with v/f control and slip regulation.

Unit V: Vector Controlled Drive: Review of DC drive analogy, equivalent circuit and phasor diagram, principles of vector control, direct or feedback vector control, flux vector estimation, indirect or feed forward vector control, vector control of line side PWM rectifier, statorflux-oriented vector control, vector control of current Fed inverter drive.

Unit VI: Direct Torque & Flux Control (DTC): Torque expression with stator & rotor fluxes, control strategy of DTC, Adaptive control: self-tuning control, Model Referencing adaptive control (MRAC), sliding mode control: Control Principle, sliding trajectory control of vector drive.

Books Recommended:

Text Books:

1. Bimal K. Bose, ñModern Power Electronics and AC Driveò,Pearson Education.
2. VedamSubrahmanyam, ñElectric Drives: Concepts & Applicationsò, Tata McGraw Hill Publishing Co Ltd.
3. Austin Hughes and Bill Drury, ñElectric Motor and Drives: Fundamentals, Types and Applicationsò, Newnes, Oxford.

Reference Books:

1. S. K. Pillai, ñA First Course on Electrical Drivesò, New Age International Publishing Co. Ltd.
2. Gopal. K. Dubey, ñFundamentals of Electrical Drivesò, CRC Press
3. R. Krishnan, ñElectric Motor Drives: Modeling, Analysis & Controlò, Prentice Hall of India Pvt Ltd.
4. M. D. Singh & K. B. Khanchandani, ñPower Electronicsò, Tata McGraw Hill Publishing Co Ltd.
5. G. K. Dubey, ñPower Semiconductor Controlled Drivesò, Prentice Hall.
6. Dr. P. S. Bimbhra, ñGeneralized theory of Electrical Machineò, Khanna Publishers

7EE05 PROFESSIONAL ELECTIVE – IV:
(iii) DIGITAL CONTROL SYSTEMS

Course Outcomes:

1. Discretize the continuous system
2. Analyze the response of the system.
3. Analyze the stability of the system.
4. controllability/ observability of a system
5. Discretize the analog controller/ compensator
6. Design the state feedback control law.
7. Design the estimator for the given system.
8. Design a component or a product applying all the relevant standards with realistic constraints

Unit:I Introduction: Overview of design approaches, continuous versus digital control, sampling process, Sample and hold device, A/D, D/A conversion.Calculus of difference equations.Z-transform. Pulse transfer function

Unit:II Stability Analysis of discrete systems: location of poles, Jury's stability criterion, stability analysis through bilinear transforms. State variable analysis: State equations of discrete data systems ï State transition equations ï Relationship between state equation and transfer functions - Characteristic equations ï Eigen value ï Eigen vector.

Unit: III: State Space Representation: Diagonalization of Matrix ï Jordan canonical form ï Methods of computing state transition matrix ï State diagram ï Decomposition of discrete data transfer function. Controllability and observability of linier time invariant discrete data systems.

Unit: IV Design of Digital Control Systems: Classical Method: Digital PID controllers and frequency domain compensation design.

Unit: V: State Feedback Design: State variable methods - Pole placement design, Observer design and the discrete linear regulator problem.

Unit:VI: Microprocessor Based Digital Control
-Selection of processors ,Mechanization of control algorithms. Iterative computation via parallel, direct, canonical, cascade realization. Case studies.

Text Books:

1. K. Ogata, ñDiscrete-time control systemsò, Pearson, 2015.
2. G. F. Franklin, J. D. Powell and M Workman, óDigital Control of Dynamic Systemsô PHI (Pearson), 2008.

7EE06 ELECTRICAL ENERGY DISTRIBUTION & UTILIZATION - LAB

- Student should perform minimum eight practical based on syllabus**.**

7EE07 DIGITAL SIGNAL PROCESSING – LAB.

- Student should perform minimum eight practical based on syllabus**.**

7EE08 ENTREPRNEUURSHIP & PROJECT MANAGEMENT - LAB.

Student will carry out minimum eight assignments based on syllabus. List of assignments is given below for reference.

List of Assignments:

1. Undertake SWOT analysis to arrive at your business idea (Product / services).
2. Undertake self-assessment test to discover your Entrepreneurial traits.
3. Undertake the market survey to identify the need of market.
4. Identify Business opportunity for you.
5. Carry out the survey of industries of your stream and prepare the report.

6. Arrange the Visit to industries/firms of your product/service stream to study their business model.
7. Visit the banks and other financial Institutions to enquire about various funding scheme for set up the new business.
8. Compile the information of government agencies and financial agencies which provide loan/financial support to establish the business.
9. Prepare a report of technological and financial feasibility of chosen product/service.
10. Prepare a marketing strategy for chosen product/service.
11. Prepare a short term & long-term goal of your business.
12. Prepare a business plan for your chosen product/services.
13. Arrange a discussion session with successful entrepreneur to discuss on your business plan.
14. Study the stories of successful entrepreneur.
15. Prepare a DPR (Detail Project Report) of chosen product /services.

7EE09 PROJECT & SEMINAR

Seminar:
Each one of the students will be assigned a Seminar Topic in the current and frontier areas. The student has to conduct a detailed study/survey on the assigned topic and prepare a report. The student will make an oral presentation followed by a brief question and answer session. The Seminar (presentation and report) will be evaluated by an internal assessment committee for 50 marks.

Project:
The objective of the project is to enable the students to work in groups of not more than six members in each group on a project involving analytical, experimental, design or combination of these in the area of Electrical Engineering. Each project shall have a guide. The student is required to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. On completion of the work, a project report should be prepared and submitted to the department. The evaluation is based on continuous internal assessment by an internal assessment committee for 75 marks. The university examination, which carries a total of 75 marks, will be a Viva Voce examination at the end of VIII Semester, conducted by a committee of one external examiner appointed by the University and one internal examiner/Guide.

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EIGHTH SEMESTER

8EE01 EMBEDED SYSTEMS

Course Outcomes:
After completing this course, the students will be able to:

6. Acquire a basic knowledge about fundamentals of microcontrollers
7. Acquire a basic knowledge about programming and system control to perform a specific task.
8. Acquire knowledge about devices and buses used in embedded networking.
9. Develop programming skills in embedded systems for various applications.
10. Acquire knowledge about Life cycle of embedded design and its testing.

Unit-I : Introduction: Embedded systems design, embedded system architecture, embedded systems model, An Overview of Programming Languages and Examples of Their Standards, Standards and Networking, Multiple Standards-Based Device Example: Digital Television (DTV).

Unit-II: Embedded Hardware Building Blocks and the Embedded Board:
Powering the hardware, Instruction Set Architecture (ISA) architecture model, internal processor design and its performance.

Unit-III: Memory: ROM, RAM and auxiliary memory, Memory Management of External Memory, Performance of memory .I/ O: Managing Data: Serial vs. Parallel I/O, Interfacing the I/O Components, I/O performance.Buses: arbitration, timing and performance.

Unit-IV: Device Drivers: Device Drivers for Interrupt-Handling, Memory Device Drivers, On-board Bus Device Drivers, Board I/O Driver. Embedded OS: Multitasking and Process Management, Memory Management.

Unit-V: Embedded OS: I/O and File System Management, OS Standards: POSIX, OS Performance Guidelines. Middleware: meaning and examples. Application layer software: meanings and examples.

Unit-VI: Embedded system design & implementation:
Defining the System-Creating the Architecture and Documenting the Design, Stages in creating an Embedded System Architecture. Implementing the Design. Quality Assurance and Testing of the Design.

Text Book: Tammy Noergaard ñEmbedded Systems Architectureò Elsevier Newnes Publication.
Reference Books:
1. Rajkamal , ñEmbedded Systems, Architecture, Programming & Designò TMH.
2. Jane W. S. Liu óReal Time Systemsò, Pearson Education
3. Vahid&Givargis ñEmbedded System Designò John Wiley & Sons P Ltd.
4. Peter Marwedel ñEmbedded Systems Designò Springer, Netherland.