VELTECH MULTI TECH Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

Accredited by NBA, New Delhi

An ISO 9001:2008 Certified Institution

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Approved by AICTE, New Delhi NBA Accredited & Affiliated to Anna University Chennai-25

SYLLABUS

WEEKLY SCHEDULE

SEMESTER VI **2014- 2015**

DEPARTMENT OF EEE

4 YEAR COURSE

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VELTECH MULTITECH Dr.RANGARAJAN Dr.SAKUNTHALA ENGG. COLLEGE

DEPARTMENT OF EEE

WEEKLY SCHEDULE

SEM : VI YEAR : III

ACADEMIC YEAR: 2014– 2015

S.No	WEEKS	DATE	
		FROM	TO
1	WEEK1	02.01.15	09.01.15
2	WEEK2	12.01.15	16.01.15
3	WEEK3	19.01.15	23.01.15
4	WEEK4	27.01.15	30.01.15
5	WEEK5	02.02.15	06.02.15
6	WEEK6	09.02.15	13.02.15
7	WEEK7	16.02.15	20.02.15
8	WEEK8	23.02.15	27.02.15
9	WEEK9	02.03.15	06.03.15
10	WEEK10	09.03.15	13.03.15
11	WEEK11	16.03.15	20.03.15
12	WEEK12	23.03.15	27.03.15
13	WEEK13	30.03.15	01.04.15
14	WEEK14	06.04.15	10.04.15
15	WEEK15	13.04.15	17.04.15
16	WEEK16	20.04.15	24.04.15
17	WEEK17	27.04.15	30.04.15

CONTENTS

THEORY

PRACTICAL

TEST SCHEDULE

SL.NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	UNIT TEST III	UNIT TEST IV	UNIT TEST V
1	EE2351	Power System Analysis	22.01.15 FN	11.02.15 FN	03.03.15 FN	23.03.15 FN	13.04.15 FN
2	EE2352	Solid State Drives	22.01.15 AN	11.02.15 AN	03.03.15 AN	23.03.15 AN	13.04.15 AN
3	EE2353	High Voltage Engineering	23.01.15 FN	12.02.15 FN	04.03.15 FN	24.03.15 FN	15.04.15 FN
4	EE2354	Microprocessors & Microcontroller	23.01.15 AN	12.02.15 AN	04.03.15 AN	24.03.15 AN	15.04.15 AN
5	EE2355	Design of Electrical Machines	24.01.15 FN	13.02.15 FN	05.03.15 FN	25.03.15 FN	16.04.15 FN
6	CS2361	Computer Networks	24.01.15 AN	13.02.15 AN	05.03.15 AN	25.03.15 AN	16.04.15 AN
7	EE2021	Fiber Optics And Laser Instrumentation	25.01.15 FN	14.02.15 FN	06.03.15 FN	26.03.15 FN	17.04.15 FN

MODEL THEORY

Sl. NO	DATE	SUB.CODE	SUBJECT
1	20.04.2015	EE2351	Power System Analysis
2	21.04.2015	EE2352	Solid State Drives
3	22.04.2015	EE2353	High Voltage Engineering
4	23.04.2015	EE2354	Microprocessors & Microcontroller
5	24.04.2015	EE2355	Design of Electrical Machines

6	27.04.2015	CS2361	Computer Networks
7	28.04.2015	EE2021	Fiber Optics And Laser Instrumentation

EE2351 POWER SYSTEM ANALYSIS

UNIT I INTRODUCTION

WEEK 1: Modern power system (or) electric energy system - Analysis for system planning and operational studies

WEEK 2: Basic components of a power system. Generator models -transformer model. Transmission

system model - load representation

WEEK 3:. Single line diagram – per phase and per unit representation Change of base. Simple building algorithms for the formation of Y-Bus matrix and Z-Bus matrix.
UNIT TEST-I

UNIT II POWER FLOW ANALYSIS

WEEK 4: Importance of power flow analysis in planning and operation of power systems. Statement of power flow problem - classification of buses into P-Q buses, P-V (voltage controlled) buses and slack bus.

WEEK 5: Development of Power flow model in complex variables form and polar variables form.

Iterative solution using Gauss-Seidel method including Q-limit check for voltage controlled buses

WEEK 6: Algorithm and flow chart. Iterative solution using Newton-Raphson (N-R) method (polar form) including Q-limit check and bus switching for voltage-controlled buses – Jacobian matrix elements Algorithm and flow chart. Development of Fast Decoupled Power Flow (FDPF) model and iterative solution –algorithm and flowchart; Comparison of the three methods
UNIT TEST-II

UNIT III FAULT ANALYSIS – BALANCED FAULTS

WEEK 7: Importance short circuit (or) for fault analysis.

WEEK 8: Basic assumptions in fault analysis of power systems. Symmetrical (or) balanced three phase faults, Problem formulation.

WEEK 9: Fault analysis using Z-bus matrix, Algorithm and flow chart.

Double integrals using trapezoidal and Simpsons's rules.- Single step methods: Taylor series method.

Computations of short circuit capacity, post fault voltage and currents.

UNIT TEST-III

UNIT IV FAULT ANALYSIS – UNBALANCED FAULTS

WEEK 10: Introduction to symmetrical components – sequence impedances – sequence networks

WEEK 11: Representation of single line to ground, line to line and double line to ground fault conditions

WEEK 12: Unbalanced fault analysis - problem formulation – analysis using Z-bus Impedance matrix – (algorithm and flow chart.).
UNIT TEST-IV

UNIT V STABILITY ANALYSIS

WEEK 13:Importance of stability analysis in power system planning and operation - classification of power system stability - angle and voltage stability.

WEEK 14: Simple treatment of angle stability into small-signal and large-signal (transient) stability Single Machine Infinite Bus (SMIB)

System: Development of swing equation

WEEK 15: Equal area criterion - determination of critical clearing angle and time by using modified Euler method and Runge-Kutta second order method Algorithm and flow chart.

UNIT TEST-V

MODEL PRACTICAL EXAM

WEEK 16: MODEL EXAM

TEXT BOOKS

1. Hadi Saadat, 'Power System Analysis', Tata McGraw Hill Publishing Company, New Delhi, 2002.

2. Olle. I. Elgerd, 'Electric Energy Systems Theory – An Introduction', Tata McGraw Hill Publishing Company Limited, New Delhi, Second Edition, 2003.

REFERENCE BOOKS

1. P. Kundur, 'Power System Stability and Control, Tata McGraw Hill, Publications, 1994.

2. John J. Grainger and W.D. Stevenson Jr., 'Power System Analysis', McGraw Hill International Book Company, 1994.

3. I.J. Nagrath and D.P. Kothari, 'Modern Power System Analysis', Tata McGraw-Hill Publishing Company, New Delhi, 1990.

4. .K.Nagasarkar and M.S. Sukhija Oxford University Press, 2007.

EE2352 SOLID STATE DRIVES

UNIT I DRIVE CHARACTERISTICS

WEEK 1: Equations governing motor load dynamics

WEEK 2: Steady state stability, Multi quadrant dynamics

WEEK 3: - Acceleration, deceleration, starting and stopping Load torque characteristics of various drives.
UNIT TEST-I

UNIT II CONVERTER / CHOPPER FED DC MOTOR DRIVE

WEEK 4: Steady state analysis of the single and three phase fully controlled converter fed separately excited D.C motor drive.

WEEK 5: Continuous and discontinuous conduction Time ratio and current limit control

WEEK 6: 4 quadrant operation of converter.

UNIT TEST-II

UNIT III: DESIGN OF CONTROLLERS FOR DRIVES

WEEK 7: Transfer function for DC motor, load and converter.

WEEK 8: Closed loop control with current and speed feedback, Armature voltage control and field weakening mode control.

WEEK 9: Design of controllers: Current controller and speed controller, Converter selection and characteristics simulation software package.
UNIT TEST-III

UNIT IV INDUCTION MOTOR DRIVES

WEEK 10: Stator voltage control – energy efficient drive - v/f control, constant air-gap flux.

WEEK 11: Field weakening mode - voltage/current fed inverters.

WEEK 12:Block diagram of vector control -closed loop control.

UNIT TEST-IV

UNIT V SYNCHRONOUS MOTOR DRIVES

WEEK 13: V/f control and self-control of synchronous motor - Marginal angle control and power factor control

WEEK 14: Permanent magnet synchronous motor,

WEEK 15: Block diagram of closed loop control
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS:

1. Gopal K.Dubey, "Power Semi conductor controlled drives " Prentice Hall Inc., New Jersey 1989.

2. Bimal K. Bose. 'Modern Power Electronics and AC Drives', PHI / Pearson Education, 2002.

REFERENCE BOOKS:

1. N.K.De and S.K.Sen Electrical Drices" PHI, 2006 9th print.

2. Murphy J.M.D. and Turnbull, " Thyristor control of AC Motor" Pergamon Press Oxford 1988.

3. R. Krishnan, 'Electric Motor & Drives Modeling, Analysis and Control', Prentice Hall of India, 2001.

EE 2353 HIGH VOLTAGE ENGINEERING

UNIT I OVER VOLTAGES IN ELECTRICAL POWER SYSTEMS

WEEK 1: Causes of over voltages and its effects on power system.

WEEK 2: Lightning, switching surges and temporary over voltages.

WEEK 3: Protection against over voltages Bewley's lattice diagram.
UNIT TEST-I

UNIT II ELECTRICAL BREAKDOWN IN GASES, SOLIDS AND LIQUIDS

WEEK 4: Gaseous breakdown in uniform and non-uniform fields – Corona discharges

WEEK 5: Vacuum Breakdown

WEEK 6: Conduction and breakdown in pure and commercial liquids, Breakdown mechanisms in solid and composite dielectrics.
UNIT TEST-II

UNIT III GENERATION OF HIGH VOLTAGES AND HIGH CURRENTS

WEEK 7: Generation of High DC, AC,.

WEEK 8: Tripping of impulse generators

WEEK 9: Control of impulse generators. Impulse voltages and currents
UNIT TEST-III

UNIT IV MEASUREMENT OF HIGH VOLTAGES AND HIGH CURRENTS

WEEK 10: Measurement of High voltages

WEEK 11: Digital techniques in high voltage measurement.

WEEK 12: High currents

UNIT TEST-IV

UNIT V HIGH VOLTAGE TESTING & INSULATION COORDINATION

WEEK 13: High voltage testing of electrical power apparatus –testing.

WEEK 14: Power frequency, impulse voltage and DC -International and Indian standards

WEEK 15: Insulation Coordination.

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. M. S. Naidu and V. Kamaraju, 'High Voltage Engineering', Tata McGraw Hill, 3rd Edition, 2004.

2. E. Kuffel and M. Abdullah, 'High Voltage Engineering', Pergamon Press, Oxford, 1970.

REFERENCE BOOKS

1. E. Kuffel and W. S. Zaengel, 'High Voltage Engineering Fundamentals', Pergamon Press, Oxford, London, 1986.

2. L. L. Alston, Oxford University Press, New Delhi, First Indian Edition, 2006.

3. Power Plant Technology, M.M. El-Wakil McGraw Hill 1984.

EE2354 MICROPROCESSORS AND MICRO CONTROLLER

UNIT I 8085 and 8086 PROCESSOR

WEEK 1: Hardware Architecture pintouts – Signals, Memory interfacing – I/O ports and data transfer concepts.

WEEK 2: Timing Diagram, Interrupt structure. Interfacing with 8085 - A/D and D/A converter interfacing .Data transfer, data manipulation & control instructions

WEEK 3:.Programming: Loop structure with counting & indexing, Look up table - Subroutine instructions – stack

UNIT TEST-I

.**UNIT II PROGRAMMING OF 8085 PROCESSOR**

WEEK 4: Study of Architecture and programming of ICs: 8255 PPI, 8259 PIC.

WEEK 5: 8251 USART, 8279 Key board display controller and 8253 Timer/ Counter

WEEK 6: Interfacing with 8085 - A/D and D/A converter interfacing.

UNIT TEST-II

UNIT III PERIPHERAL INTERFACING

WEEK 7: Functional block diagram - Instruction format and addressing modes

WEEK 8: Timing Diagram Interrupt structure

WEEK 9: Timer –I/O ports. Serial communication.
UNIT TEST-III

UNIT IV PERIPHERAL INTERFACING

WEEK 10: Functional block diagram - Instruction format and addressing modes

WEEK 11: Timing Diagram Interrupt structure

WEEK 12: Timer –I/O ports – Serial communication.

UNIT TEST-IV

UNIT V MICRO CONTROLLER PROGRAMMING & APPLICATIONS

WEEK 13: Data Transfer, Manipulation, Control & I/O instructions

WEEK 14 Simple programming exercises key board and display interface.

WEEK 15: Closed loop control of servo motor- stepper motor control, Washing Machine Control

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1"Microprocessor and Microcontrollers", Krishna Kant Eastern Company Edition, Prentice – Hall of India, New Delhi , 2007.

2.Muhammad Ali Mazidi & Janice Gilli Mazidi, R.D.Kinely 'The 8051 Micro Controller and Embedded Systems', PHI Pearson Education, 5th Indian reprint, 2003

REFERENCE BOOKS

1. R.S. Gaonkar, 'Microprocessor Architecture Programming and Application', Wiley Eastern Ltd., New Delhi.

2. The 8088 & 8086 Microprocessors , Walter A Tribal & Avtar Singh, Pearson, 2007, Fourth Edition

EE2355 DESIGN OF ELECTRICAL MACHINES

UNIT I INTRODUCTION

WEEK 1: Major considerations in Electrical Machine Design -

WEEK 2: Electrical Engineering Materials, Space factor – Choice of Specific Electrical and Magnetic loadings

WEEK 3: Thermal considerations - Heat flow – Temperature rise,Rating of machines – Standard specifications.
UNIT TEST-I

UNIT II DC MACHINES

WEEK 4: Output Equations – Main Dimensions - Magnetic circuit calculations

WEEK 5: Carter's Coefficient - Net length of Iron –Real & Apparent flux densities,

WEEK 6: Selection of number of poles – Design of Armature – Design of commutator and brushes – Performance prediction using design values.

UNIT TEST-II

UNIT III TRANSFORMERS

WEEK 7: Output Equations – Main Dimensions - KVA output for single and three phase transformers

WEEK 8: Window space factor – Overall dimensions.

WEEK 9: Operating characteristics – Regulation – No load current Temperature rise in Transformers - Design of Tank - Methods of cooling of Transformers

UNIT TEST-III

UNIT IV INDUCTION MOTORS

WEEK 10: Output equation of Induction motor – Main dimensions – Length of air gap;

WEEK 11: Rules for selecting rotor slots of squirrel cage machines – Design of rotor bars & slots – Design of end rings.

WEEK 12: Design of wound rotor –– Magnetic leakage calculations – Leakage reactance of polyphase machines- Magnetizing current - Short circuit current – Circle diagram - Operating characteristics

UNIT TEST-IV

UNIT V SYNCHRONOUS MACHINES

WEEK 13:Output equations – choice of loadings – Design of salient pole machines.

WEEK 14: Short circuit ratio – shape of pole face – Armature design - Armature parameters – Estimation of air gap length – Design of rotor.

WEEK 15: Design of damper winding – Determination of full load field mmf – Design of field winding – Design of turbo alternators, Rotor design.

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. Sawhney, A.K., 'A Course in Electrical Machine Design', Dhanpat Rai & Sons, New Delhi, 1984.
2. Sen, S.K., 'Principles of Electrical Machine Designs with Computer Programmes', Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 1987.

REFERENCES

1. A.Shanmugasundaram, G.Gangadharan, R.Palani 'Electrical Machine Design Data Book', New Age Intenational Pvt. Ltd., Reprint 2007.

2. 'Electrical Machine Design', Balbir Singh, Brite Publications, Pune.

CS2361 COMPUTER NETWORKS

UNIT I

WEEK 1: Introduction to networks – network architecture – network performance,

WEEK 2: Switching functions and simplification using K-maps & Quine McCluskey method.

transmission – Ethernet

WEEK 3:– Rings –FDDI.Wireless networks – Switched networks – bridges
UNIT TEST-I

UNIT II

WEEK 4: Internetworking – IP - ARP – Reverse Address Resolution Protocol

WEEK 5: Dynamic Host Configuration Protocol – Internet Control Message Protocol

WEEK 6: Routing – Routing algorithms – Addressing – Subnetting – CIDR – Inter domain routing – IPv6
UNIT TEST-II

.**UNIT III**

WEEK 7: Transport Layer – User Datagram Protocol (UDP) – Transmission Control Protocol

WEEK 8: State assignment , Congestion control

WEEK 9: Flow control Queuing Disciplines Congestion – Avoidance Mechanisms

UNIT TEST-III

UNIT IV

WEEK 10: Data Compression – introduction to JPEG, MPEG, and MP3 – cryptography

WEEK 11: symmetric-key – public-key – authentication – key distribution – key agreement

WEEK 12: PGP –SSH – Transport layer security – IP Security – wireless security - Firewalls
UNIT TEST-IV

UNIT V

WEEK 13: Domain Name System (DNS) – E-mail – World Wide Web (HTTP)

WEEK 14: Simple Network Management Protocol – File Transfer Protocol (FTP).
WEEK 15: Web Services -Multimedia Applications – Overlay networks .
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1.Larry L. Peterson and Bruce S. Davie, "Computer Networks: A Systems Approach", Fourth Edition, Elsevier Publishers Inc., 2007.

2. Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, PHI, 2003.

REFERENCES

1. James F. Kuross and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Third Edition, Addision wesley, 2004.
2. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.

3. Nader F. Mir, "Computer and communication networks", Pearson Education, 2007.

EE2021 FIBER OPTICS AND LASER INSTRUMENTS

UNIT I OPTICAL FIBERS AND THEIR PROPERTIES

WEEK 1: Principles of light propagation through a fibre - Different types of fibres and their properties, fiber characteristics

WEEK 2: Absorption losses – Scattering losses – Dispersion

WEEK 3: Connectors and splicers.Fibre termination – Optical sources – Optical detectors.

UNIT TEST-I

UNIT II INDUSTRIAL APPLICATION OF OPTICAL FIBRES

WEEK 4: Fibre optic sensors – Fibre optic instrumentation system – Different types of modulators.

WEEK 5: – Interferometric method of measurement of length – Moire fringes.

WEEK 6: Measurement ofpressure, temperature, current, voltage, liquid level and strain.
UNIT TEST-II

.**UNIT III LASER FUNDAMENTALS**

WEEK 7: Fundamental characteristics of lasers – Three level and four level lasers – Properties of laser

WEEK 8: Laser modes – Resonator configuration, Q-switching and mode locking

WEEK 9: Cavity damping Types of lasers – Gas lasers, solid lasers, liquid lasers, semiconductor lasers.

UNIT TEST-III

UNIT IV : **INDUSTRIAL APPLICATION OF LASERS**

WEEK 10: Laser for measurement of distance, length, velocity

.WEEK 11: acceleration, current, voltage and Atmospheric effect.

WEEK 12: Material processing – Laser heating, welding, melting and trimming of material – Removal and vaporization
UNIT TEST-IV

UNIT V HOLOGRAM AND MEDICAL APPLICATIONS

WEEK 13: Holography – Basic principle - Methods – Holographic interferometry and application,

Holography for non-destructive testing

WEEK 14: Holographic components – Medical applications of lasers, laser and tissue interactive.

WEEK 15: Laser instruments for surgery, removal of tumors of vocal cards, brain surgery, plastic surgery, gynaecology and oncology.
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. J.M. Senior, 'Optical Fibre Communication – Principles and Practice', Prentice Hall of India, 1985.

2. J. Wilson and J.F.B. Hawkes, 'Introduction to Opto Electronics', Prentice Hall of India, 2001

REFERENCE BOOKS

1. G. Keiser, 'Optical Fibre Communication', McGraw Hill, 1995.

2. M. Arumugam, 'Optical Fibre Communication and Sensors', Anuradha Agencies, 2002.

3. John F. Read, 'Industrial Applications of Lasers', Academic Press, 1978.

4. Monte Ross, 'Laser Applications', McGraw Hill, 1968.

GE 1351 PRESENTATION SKILLS AND TECHNICAL SEMINAR

LIST OF EXPERIMENTS

OBJECTIVE

During the seminar session each student is expected to prepare and present a topic on engineering/ technology, for duration of about 8 to 10 minutes. In a session of three periods per week, 15

students are expected to present the seminar. A faculty guide is to be allotted and he / she will guide and monitor the progress of the student and maintain attendance also.

Students are encouraged to use various teaching aids such as over head projectors, power point presentation and demonstrative models. This will enable them to gain confidence in facing the placement interviews.

EE2356 MICROPROCESSOR AND MICRO CONTROLLER LABORATORY

LIST OF EXPERIMENTS

8-bit Microprocessor

1. Simple arithmetic operations: Multi precision addition subtraction / multiplication / division.
2. Programming with control instructions: Increment / Decrement, Ascending /Descending order, Maximum / Minimum of numbers ,Rotate instructions Hex / ASCII / BCD code conversions.
3. A/D Interfacing.
4. D/A Interfacing.
5. Traffic light controller Interfacing
6. Steeper Motor Interfacing
7. Simple experiments using 8251, 8279, 8254.

16-bit Microprocessor

8. Simple arithmetic operations: Multi Precision addition / subtraction / multiplication / division.

8-bit Microcontroller

9. Demonstration of basic instructions with 8051 Micro controller execution, including:
    a. Conditional jumps, looping
    b. Calling subroutines.
    c. Stack parameter testing
10. Interfacing Keyboard and Display
11. Stepper motor Interfacing
    a. D/A Interfacing
    b. Traffic light controller interfacing
    c. 8051 based Serial Port Communication.