VEL TECH MULTITECH
Dr RANGARAJAN Dr.SAKUNTHALA ENGINEERING COLLEGE

(An ISO 9001: 2008 Certified Institution)
(Owned by Vel Trust)
(Approved by Govt. of Tamil Nadu and affiliated to Anna University and Accredited by NBA, New Delhi)

SYLLABUS

WEEKLY SCHEDULE

VII SEMESTER 2014 - 2015

DEPARTMENT OF EEE

IV YEAR DEGREE COURSE

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WEEK DETAILS

SL.NO.	WEEK	FROM	TO
1	**WEEK1**	**24-06-2014**	**27-06-2014**
2	**WEEK2**	**30-06-2014**	**04-07-2014**
3	**WEEK3**	**07-07-2014**	**11-07-2014**
4	**WEEK4**	**14-07-2014**	**18-07-2014**
5	**WEEK5**	**21-07-2014**	**25-07-2014**
6	**WEEK6**	**28-07-2014**	**01-08-2014**
7	**WEEK7**	**04-08-2014**	**08-04-2014**
8	**WEEK8**	**11-08-2014**	**14-08-2014**
9	**WEEK9**	**18-08-2014**	**22-08-2014**
10	**WEEK10**	**25-08-2014**	**28-08-2014**
11	**WEEK11**	**01-09-2014**	**05-09-2014**
12	**WEEK12**	**08-09-2014**	**12-09-2014**
13	**WEEK13**	**15-09-2014**	**19-09-2014**
14	**WEEK14**	**22-09-2014**	**26-09-2014**
15	**WEEK15**	**29-09-2014**	**01-10-2014**
16	**WEEK16**	**06-10-2014**	**10-10-2014**
17	**WEEK17**	**13-10-2014**	**17-10-2014**
18	**WEEK18**	**20-10-2014**	**24-10-2014**
19	**WEEK19**	**27-10-2014**	**31-10-2014**

SUBJECT CONTENTS

SL.NO	SUBJECT CODE	SUBJECT NAME
THEORY		
1	**EE2401**	**Power System Operation and Control**
2	**EE2402**	**Protection & Switchgear**
3	**EE2403**	**Special Electrical Machines**
4	**MG2351**	**Principles of Management**
5	**CS2412**	**Operating Systems**
6	**EE2024**	**Bio medical instrumentation**
PRACTICAL		
7	**EE2404**	**POWER SYSTEM SIMULATION LABORATORY**
8	**EE 2405**	**COMPREHENSION**

TEST / EXAM SCHEDULE

SL.NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	UNIT TEST III	UNIT TEST IV	UNIT TEST V
1	EE2401	Power System Operation and Control	08/07/14 FN	30/07/14 FN	20/08/14 FN	09/09/14 FN	29/09/14 FN
2	EE2402	Protection & Switchgear	08/07/14 AN	30/07/14 AN	20/08/14 AN	09/09/14 AN	29/09/14 AN
3	EE2403	Special Electrical Machines	09/07/14 FN	31/07/14 FN	21/08/14 FN	10/09/14 FN	30/09/14 FN
4	MG2351	Principles of Management	09/07/14 AN	31/07/14 AN	21/08/14 AN	10/09/14 AN	30/09/14 AN
5	CS2412	Operating Systems	10/07/14 FN	01/08/14 FN	22/08/14 FN	11/09/14 FN	01/10/14 FN
6	EE2024	Bio medical instrumentation	10/07/14 AN	01/08/14 AN	22/08/14 AN	11/09/14 AN	01/10/14 AN

SL.NO	SUBJECT CODE	SUBJECT NAME	MODEL EXAM
1	EE2401	Power System Operation and Control	13-10-2014
2	EE2402	Protection & Switchgear	14-10-2014
3	EE2403	Special Electrical Machines	15-10-2014
4	MG2351	Principles of Management	16-10-2014
5	CS2412	Operating Systems	17-10-2014
6	EE2024	Bio medical instrumentation	20-10-2014

EE2401 POWER SYSTEM OPERATION AND CONTROL

WEEK 1:

UNIT I INTRODUCTION System load variation: System load characteristics, load curves - daily, weekly and annual, load-duration curve, load factor, diversity factor.

WEEK 2: Reserve requirements: Installed reserves, spinning reserves, cold reserves, and hot reserves. Overview of system operation: Load forecasting, unit commitment, load dispatching

WEEK 3: Overview of system control: Governor Control, LFC, EDC, AVR, system voltage control, security control

WEEK 4: UNIT TEST-I

UNIT II: REAL POWER - FREQUENCY CONTROL

Fundamentals of speed governing Mechanism and modeling: Speed-load characteristics

WEEK 5: Load sharing between two synchronous machines in parallel ;concept of control area, LFC control of a single-area system

WEEK 6: Static and dynamic analysis of uncontrolled and controlled cases, Economic Dispatch Control. Multi-area systems: Two-area system modeling; static analysis, uncontrolled case; tie line with frequency bias control of two-area system derivation, state variable

WEEK 7: UNIT TEST-II

UNIT III. REACTIVE POWER–VOLTAGE CONTROL

Typical excitation system, modeling, static and dynamic analysis, stability compensation;

WEEK 8:
Generation and absorption of reactive power: Relation between voltage, power and reactive power at a node; method of voltage control

WEEK 9: Injection of reactive power. Tap-changing transformer, numerical problems - System level control using generator voltage Magnitude setting, tap setting of OLTC transformer and MVAR injection of switched capacitors to maintain acceptable voltage profile and to minimize transmission loss

WEEK 10: UNIT TEST-III
UNIT 4: UNIT COMMITMENT AND ECONOMIC DISPATCH
Statement of Unit Commitment (UC) problem; constraints in UC: spinning reserve, thermal unit constraints, hydro constraints, fuel constraints and other constraints; UC solution methods:

WEEK 11: Priority-list methods, forward dynamic programming approach, numerical problems only in priority-list method using full-load average production cost. Incremental cost curve, co-ordination equations without loss and with loss, solution by direct method and λ-iteration method. No derivation of loss coefficients.)

WEEK 12: Base point and participation factors. Economic dispatch controller added to LFC control.

WEEK 13: UNIT TEST-IV

UNIT 5. COMPUTER CONTROL OF POWER SYSTEMS
Energy control centre: Functions
WEEK 14: Monitoring,data acquisition and control. System hardware configuration – SCADA
and EMS functions: Network topology determination, state estimation,security analysis and control.

WEEK 15: Various operating states: Normal, alert, emergency, inextremis and restorative. State transition diagram showing various state transitions and control strategies.

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS

1. Olle. I. Elgerd, 'Electric Energy Systems Theory – An Introduction', Tata McGraw Hill Publishing Company Ltd, New Delhi, Second Edition, 2003.
2. Allen.J.Wood and Bruce F.Wollenberg, 'Power Generation, Operation and Control', John Wiley & Sons, Inc., 2003.
3. P. Kundur, 'Power System Stability & Control', McGraw Hill Publications, USA, 1994.

REFERENCE BOOKS

1. D.P. Kothari and I.J. Nagrath, 'Modern Power System Analysis', Third Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
2. L.L. Grigsby, 'The Electric Power Engineering, Hand Book', CRC Press & IEEE Press, 2001.

EE2402 PROTECTION AND SWITCHGEAR

WEEK 1:

UNIT I

Importance of protective schemes for electrical apparatus and power system. Qualitative review of faults and fault currents

WEEK 2: relay terminology – definitions - and essential qualities of protection.Protection against over voltages due to lightning and switching - arcing grounds -

WEEK 3: Peterson Coil - ground wires - surge absorber and diverters Power System earthing – neutral Earthing - basic ideas of insulation coordination.

WEEK 4: UNIT TEST-I
UNIT II
Electromagnetic relays – over current, directional and non-

WEEK 5: directional, distance, negative sequence, differential and under frequency relays –

WEEK 6: Introduction to static relays.

WEEK 7: UNIT TEST-II
UNIT III
Main considerations in apparatus protection - transformer, generator and motor

WEEK 8: protection - protection of busbars. Transmission line protection - zones of protection.

WEEK 9: CTs and PTs and their applications in protection schemes.

WEEK 10: UNIT TEST-III
UNIT IV
Physics of arc phenomena and arc interruption. DC and AC circuit breaking - restriking

WEEK 11: voltage and recovery voltage - rate of rise of recovery voltage - resistance switching

WEEK 12: current chopping - interruption of capacitive current.

WEEK 13: UNIT TEST-IV

UNIT V Types of circuit breakers – air blast, air break, oil,

WEEK 14:
SF6 and vacuum circuit breakers – comparative merits of different circuit breakers –
WEEK 15: testing of circuit breakers.

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS:

1. M.L. Soni, P.V. Gupta, V.S. Bhatnagar, A. Chakrabarti, 'A Text Book on PowerSystem Engineering', Dhanpat Rai & Co., 1998. (For All Chapters 1, 2, 3, 4 and 5).
2. R.K.Rajput, A Tex book of Power System Engineering. Laxmi Publications, FirstEdition Reprint 2007.

REFERENCES

1. Sunil S. Rao, 'Switchgear and Protection', Khanna publishers, New Delhi, 1986.
2. C.L. Wadhwa, 'Electrical Power Systems', Newage International (P) Ltd., 2000.
3. B. Ravindranath, and N. Chander, 'Power System Protection & Switchgear', WileyEastern Ltd., 1977.
4. Badri Ram, Vishwakarma, 'Power System Protection and Switchgear', Tata McGrawHill, 2001

EE2403 SPECIAL ELECTRICAL MACHINES

WEEK 1:
UNIT I

Constructional features – Types – Axial and Radial flux motors – Operating principles –

WEEK 2: Variable Reluctance and Hybrid Motors – SYNREL Motors

WEEK 3: Voltage and Torque Equations - Phasor diagram - Characteristics.

WEEK 4: UNIT TEST-I

UNIT II

Constructional features – Principle of operation – Variable reluctance motor

WEEK 5: Hybrid motor – Single and multi stack configurations – Torque equations – Modes of excitations

WEEK 6: Characteristics – Drive circuits – Microprocessor control of stepping motors – Closed loop control.

WEEK 7: UNIT TEST-II

UNIT III

Constructional features – Rotary and Linear SRMs - Principle of operation

WEEK 8: Torque production – Steady state performance prediction- Analytical method -Power Converters and their controllers

WEEK 9: Methods of Rotor position sensing – Sensorless operation – Closed loop control of SRM - Characteristics.

WEEK 10: UNIT TEST-III

UNIT IV

Permanent Magnet materials – Magnetic Characteristics – Permeance coefficient -

WEEK 11: Principle of operation – Types – Magnetic circuit analysis – EMF and torque equations –

WEEK 12: Commutation - Power controllers – Motor characteristics and control.

WEEK 13:
UNIT V
Principle of operation – Ideal PMSM – EMF and Torque equations

WEEK 14: UNIT TEST-IV
Armature reaction MMF – Synchronous Reactance – Sinewave motor with practical windings - Phasor
WEEK 15: diagram – Torque/speed characteristics - Power controllers - Converter Volt-ampere requirements.

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS
1. T.J.E. Miller, 'Brushless Permanent Magnet and Reluctance Motor Drives', Clarendon Press, Oxford, 1989.
2. T. Kenjo, 'Stepping Motors and Their Microprocessor Controls', Clarendon Press London, 1984.

REFERENCES
1. R.Krishnan, 'Switched Reluctance Motor Drives – Modeling, Simulation, Analysis, Design and Application', CRC Press, New York, 2001.
2. P.P. Aearnley, 'Stepping Motors – A Guide to Motor Theory and Practice', Peter Perengrinus, London, 1982.
3. T. Kenjo and S. Nagamori, 'Permanent Magnet and Brushless DC Motors', Clarendon Press, London, 1988.

MG2351 PRINCIPLES OF MANAGEMENT

WEEK 1:
UNIT I

Definition - Management - Role of managers - Evolution of Management thought -

WEEK 2: Organization and the environmental factors

WEEK 3: Trends and Challenges of Management in Global Scenario.

WEEK 4: UNIT TEST-I

UNIT II

Nature and purpose of planning - Planning process - Types of plans – Objectives - -

WEEK 5: Managing by objective (MBO) Strategies - Types of strategies - Policies – Decision Making - Types of decision - Decision Making Process

WEEK 6: Rational Decision Making Process - Decision Making under different conditions.

WEEK 7: UNIT TEST-II

UNIT III

Nature and purpose of organizing - Organization structure - Formal and informal groups organization - Line and Staff authority - Departmentation - Span of control

WEEK 8: Centralization and Decentralization - Delegation of authority - Staffing - Selection and Recruitment

WEEK 9: Orientation - Career Development - Career stages – Training - -Performance Appraisal.

WEEK 10: UNIT TEST-III

UNIT IV

Creativity and Innovation - Motivation and Satisfaction - Motivation Theories -

WEEK 11: Leadership Styles - Leadership theories - Communication - Barriers to effective communication

WEEK 12: Organization Culture - Elements and types of culture – Managing cultural diversity.

UNIT TEST-IV
WEEK 13:
UNIT V : Process of controlling - Types of control - Budgetary and non-budgetary control techniques

WEEK 14:
Managing Productivity - Cost Control - Purchase Control

WEEK 15: Maintenance Control - Quality Control - Planning operations.

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS:

1. Stephen P. Robbins and Mary Coulter, 'Management', Prentice Hall of India, 8th edition.
2. Charles W L Hill, Steven L McShane, 'Principles of Management', Mcgraw Hill Education, Special Indian Edition, 2007.

REFERENCES:

1. Hellriegel, Slocum & Jackson, ' Management - A Competency Based Approach', Thomson South Western, 10th edition, 2007.
2. Harold Koontz, Heinz Weihrich and Mark V Cannice, 'Management - A global & Entrepreneurial Perspective', Tata Mcgraw Hill, 12th edition, 2007.

3. Andrew J. Dubrin, 'Essentials of Management', Thomson Southwestern, 7th edition, 2007.

CS2412 OPERATING SYSTEMS

WEEK 1:
UNIT I
Introduction to operating systems – review of computer organization – operating system structures – system calls – system programs – system structure – virtual machines.

WEEK 2: Processes: Process concept – Process scheduling – Operations on processes – Cooperating processes – Interprocess communication –

WEEK 3: Communication in client-server systems. Case study: IPC in Linux. Threads: Multi-threading models – Threading issues. Case Study: Pthreads library

WEEK 4: UNIT TEST-I
UNIT II
CPU Scheduling: Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation.

WEEK 5: Case study: Process scheduling in Linux. Process Synchronization: The critical-section problem –Synchronization hardware – Semaphores – Classic problems of synchronization

WEEK 6: critical regions – Monitors. Deadlock: System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock.

WEEK 7:
UNIT TEST-II
UNIT 3

Memory Management: Background – Swapping – Contiguous memory allocation

WEEK 8: Paging – Segmentation – Segmentation with paging. Virtual Memory:Background Demand paging

WEEK 9: Process creation – Page replacement –Allocation of frames – Thrashing. Case Study: Memory management in Linux

WEEK 10: UNIT TEST-III

UNIT 4

File-System Interface: File concept – Access methods – Directory structure –Filesystem mounting Protection.

WEEK 11: File-System Implementation : Directory implementation Allocation methods – Free-space management – efficiency and performance –

WEEK 12: recovery – log-structured file systems. Case studies: File system in Linux – file system in Windows XP

WEEK 13:

UNIT TEST-IV

UNIT 5

I/O Systems – I/O Hardware – Application I/O interface – kernel I/O subsystem – streams – performance. Mass-

WEEK 14:

Storage Structure: Disk scheduling – Disk management –

WEEK 15: Swap-space management – RAID – disk attachment – stable storage – tertiary storage. Case study: I/O in Linux

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS

1. Silberschatz, Galvin, and Gagne, “Operating System Concepts”, Sixth Edition, Wiley India Pvt Ltd, 2003.

2. D. M. Dhamdhere, “Operating Systems: A concepts based approach”, Second Edition, Tata McGraw-Hill Publishing Company Ltd., 2006.

REFERENCES

1. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Pearson Education/PHI, 2001.
2. Harvey M. Deital, “Operating Systems”, Third Edition, Pearson Education, 2004.

EE2024 BIO–MEDICAL INSTRUMENTATION

WEEK 1:

UNIT 1

Cell and its structure – Resting and Action Potential – Nervous system: Functional organisation of the nervous system –

WEEK 2: Structure of nervous system, neurons synapse transmitters and neural communication – Cardiovascular system – respiratory system

WEEK 3: Basic components of a biomedical system - Transducers – selection criteria – Piezo electric, ultrasonic transducers - Temperature measurements - Fibre optic temperature sensors.

WEEK 4: UNIT TEST-I

UNIT 2

Electrodes –Limb electrodes –floating electrodes – pregelled disposable electrodes - Micro, needle and surface electrodes – Amplifiers: Preamplifiers, differential amplifiers, chopper amplifiers – Isolation amplifier.

WEEK 5: ECG – EEG – EMG – ERG – Lead systems and recording methods – Typical waveforms.

WEEK 6: Electrical safety in medical environment: shock hazards – leakage current-Instruments for checking safety parameters of biomedical equipments

WEEK 7: UNIT TEST-II
UNIT 3
Measurement of blood pressure – Cardiac output – Heart rate – Heart sound –
WEEK 8: Pulmonary function measurements – spirometer – Photo Plethysmography,

WEEK 9: Body Plethysmography – Blood Gas analysers : pH of blood –measurement of blood pCO2,pO2, finger-tip oxymeter - ESR, GSR measurements .

WEEK 10: UNIT TEST-III
UNIT 4
Radio graphic and fluoroscopic techniques – Computer tomography – MRI –

WEEK 11: Ultrasonography – Endoscopy – Thermography –

WEEK 12: Different types of biotelemetry systems and patient monitoring – Introduction to Biometric systems

WEEK 13:
UNIT TEST-IV
UNIT 5
Pacemakers – Defibrillators – Ventilators

WEEK 14::Nerve and muscle stimulators – Diathermy –

WEEK 15: Heart – Lung machine – Audio meters – Dialysers – Lithotripsy

WEEK 16: UNIT TEST-V

WEEK 17: MODEL EXAM

WEEK 18: MODEL PRACTICAL EXAM

TEXT BOOKS

1. R.S.Khandpur, 'Hand Book of Bio-Medical instrumentation', Tata McGraw Hill Publishing Co Ltd., 2003.
2. Leslie Cromwell, Fred J.Weibell, Erich A.Pfeiffer, 'Bio-Medical Instrumentation and Measurements', II edition, Pearson Education, 2002 / PHI.

REFERENCES

1. M.Arumugam, 'Bio-Medical Instrumentation', Anuradha Agencies, 2003.
2. L.A. Geddes and L.E.Baker, 'Principles of Applied Bio-Medical Instrumentation', John Wiley & Sons, 1975.
3. J.Webster, 'Medical Instrumentation', John Wiley & Sons, 1995.
4. C.Rajarao and S.K. Guha, 'Principles of Medical Electronics and Bio-medical Instrumentation', Universities press (India) Ltd, Orient Longman ltd 2000.

EE2404 POWER SYSTEM SIMULATION LABORATORY

1. Computation of Parameters and Modelling of Transmission Lines

2. Formation of Bus Admittance and Impedance Matrices and Solution of Networks.

3. Load Flow Analysis - I : Solution of Load Flow And Related Problems Using Gauss-Seidel Method

4. Load Flow Analysis - II: Solution of Load Flow and Related Problems. Using Newton-Raphson and Fast-Decoupled Methods

5. Fault Analysis

6. Transient and Small Signal Stability Analysis: Single-Machine Infinite Bus System

7. Transient Stability Analysis of Multimachine Power Systems

8. Electromagnetic Transients in Power Systems

9. Load – Frequency Dynamics of Single- Area and Two-Area Power Systems

10. Economic Dispatch in Power Systems.Encoder and decoder – CRC.

EE 2405 COMPREHENSION

1. Computation of Parameters and Modelling of Transmission Lines
2. Formation of Bus Admittance and Impedance Matrices and Solution of Networks.
3. Load Flow Analysis - I : Solution of Load Flow And Related Problems Using Gauss-Seidel Method
4. Load Flow Analysis - II: Solution of Load Flow and Related Problems Using Newton-Raphson and Fast-Decoupled Methods
5. Fault Analysis
6. Transient and Small Signal Stability Analysis: Single-Machine Infinite Bus System
7. Transient Stability Analysis of Multimachine Power Systems
8. Electromagnetic Transients in Power Systems
9. Load – Frequency Dynamics of Single- Area and Two-Area Power Systems
10. Economic Dispatch in Power Systems.Encoder and decoder – CRC.

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