VELTECH MULTI TECH Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

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SYLLABUS

WEEKLY SCHEDULE

SEMESTER IV **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 : IV YEAR : II

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	MA6459	Numerical Methods	22.01.15 FN	11.02.15 FN	03.03.15 FN	23.03.15 FN	13.04.15 FN
2	EE6401	Electrical Machines - I	22.01.15 AN	11.02.15 AN	03.03.15 AN	23.03.15 AN	13.04.15 AN
3	CS6456	Object Oriented Programming	23.01.15 FN	12.02.15 FN	04.03.15 FN	24.03.15 FN	15.04.15 FN
4	EE6402	Transmission and Distribution	23.01.15 AN	12.02.15 AN	04.03.15 AN	24.03.15 AN	15.04.15 AN
5	EE6403	Discrete Time Systems and Signal Processing	24.01.15 FN	13.02.15 FN	05.03.15 FN	25.03.15 FN	16.04.15 FN
6	EE6404	Measurements and Instrumentation	24.01.15 AN	13.02.15 AN	05.03.15 AN	25.03.15 AN	16.04.15 AN

MODEL THEORY

Sl. NO	DATE	SUB.CODE	SUBJECT
1	20.04.2015	MA6459	Numerical Methods
2	21.04.2015	EE6401	Electrical Machines - I
3	22.04.2015	CS6456	Object Oriented Programming
4	23.04.2015	EE6402	Transmission and Distribution
5	24.04.2015	EE6403	Discrete Time Systems and Signal Processing
6	27.04.2015	EE6404	Measurements and Instrumentation

MA6459 NUMERICAL METHODS

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS

WEEK 1: Solution of algebraic and transcendental equations - Fixed point iteration method- Newton

Raphson method

WEEK 2: - Solution of linear system of equations - Gauss elimination method – Pivoting. Gauss Jordan method. Iterative methods of Gauss Jacobi and Gauss Seidel
WEEK 3: - Matrix Inversion by Gauss Jordan method Eigen values of a matrix by Power method.
UNIT TEST-I

UNIT II INTERPOLATION AND APPROXIMATION

WEEK 4: Interpolation with unequal intervals - Lagrange's interpolation.

WEEK 5: Newton's divided difference interpolation – Cubic Splines.
WEEK 6: Interpolation with equal intervals - Newton's forward and backward difference formulae.
UNIT TEST-II

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION

WEEK 7: Approximation of derivatives using interpolation polynomials

WEEK 8: Numerical integration using Trapezoidal, Simpson's 1/3 rule- Romberg's method

WEEK 9: Romberg's method - Two point and three point Gaussian Quadrature formulae

Evaluation of double integrals by Trapezoidal and Simpson's 1/3 rules.

UNIT TEST-III

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS

WEEK 10: Single Step methods - Taylor's series method - Euler's method - Modified Euler's method

WEEK 11: Fourth order Runge-Kutta method for solving first order equations - Multi step methods:
WEEK 12: Milne's and Adams-Bash forth predictor corrector methods for solving first order equations.
UNIT TEST-IV

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

WEEK 13:Finite difference methods for solving two-point linear boundary value problems

WEEK 14: Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain
WEEK 15: One dimensional heat flow equation by explicit and implicit (Crank Nicholson) methods – One dimensional wave equation by explicit method
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. Grewal. B.S., and Grewal. J.S.,"Numerical methods in Engineering and Science", Khanna Publishers, 9th Edition, New Delhi, 2007.
2. Gerald. C. F., and Wheatley. P. O., "Applied Numerical Analysis", Pearson Education, Asia, 6th Edition, New Delhi, 2006.

REFERENCE BOOKS

1. Chapra. S.C., and Canale.R.P., "Numerical Methods for Engineers, Tata McGraw Hill, 5th Edition, New Delhi, 2007.
2. Brian Bradie. "A friendly introduction to Numerical analysis", Pearson Education, Asia, New Delhi, 2007.
3. Sankara Rao. K., "Numerical methods for Scientists and Engineers", Prentice Hall of India Private, 3rd Edition, New Delhi, 2007.

EE6401 ELECTRICAL MACHINES – I

UNIT I MAGNETIC CIRCUITS AND MAGNETIC MATERIALS

WEEK 1: Magnetic circuits –Laws governing magnetic circuits - Flux linkage, Inductance and energy

WEEK 2: Statically and Dynamically induced EMF - Torque – Properties of magnetic materials WEEK 3: Hysteresis and Eddy Current losses - AC excitation, introduction to permanent magnets Transformer as a magnetically coupled circuit.
UNIT TEST-I

UNIT II TRANSFORMERS

WEEK 4: Construction – principle of operation – equivalent circuit parameters – phasor diagrams, losses –testing
WEEK 5: efficiency and voltage regulation-all day efficiency-Sumpner's test, per unit representation – inrush current - three phase transformers-connections – Scott Connection WEEK 6: Phasing of transformer– parallel operation of three phase transformers-auto transformer – tap changing transformers-tertiary winding
UNIT TEST-II

UNIT III ELECTROMECHANICAL ENERGY CONVERSION AND CONCEPTS IN ROTATING MACHINES

WEEK 7: Energy in magnetic system – Field energy and coenergy-force and torque equations

WEEK 8: singly and multiply excited magnetic field systems-mmf of distributed windings, Winding Inductances

WEEK 9: Winding Inductances-, magnetic fields in rotating machines fields in rotating machines rotating mmf waves – magnetic saturation and leakage fluxes.
UNIT TEST-III

UNIT IV DC GENERATORS

WEEK 10: Construction and components of DC Machine – Principle of operation - Lap and wave windings-EMF equations– circuit model

WEEK 11: armature reaction –methods of excitation-commutation and interpoles

WEEK 12: compensating winding –characteristics of DC generators.

UNIT TEST-IV

UNIT V DC MOTORS

WEEK 13: Principle and operations - types of DC Motors- Speed Torque Characteristics of DC Motors- starting

WEEK 14: speed control of DC motors –Plugging, dynamic and regenerative braking

WEEK 15: testing and efficiency– Retardation test- Swinburne's test and Hopkinson's test - Permanent magnet dc motors (PMDC)-DC Motor applications.

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOK

1. Nagrath I. J and Kothari D. P. 'Electric Machines', Fourth Edition, Tata McGraw Hill Publishing Company Ltd, 2010.
2. M.N.Bandyopadhyay, Electrical Machines Theory and Practice, PHI Learning PVT LTD., New Delhi, 2009.
3. Fitzgerald. A.E., Charles Kingsely Jr, Stephen D.Umans, 'Electric Machinery', Sixth edition, Tata McGraw Hill Books Company, 2003.

REFERENCES

1. P. C. Sen., 'Principles of Electrical Machines and Power Electronics', John Wiley & Sons, 1997.
2. Syed A. Nasar, Electric Machines and Power Systems: Volume I, Mcgraw-Hill College; International Edition, January 1995.
3. Deshpande M. V., "Electrical Machines" PHI Learning Pvt. Ltd., New Delhi, 2011.
4. P.S. Bimbhra, 'Electrical Machinery', Khanna Publishers, 2003.
5. S.Sarma & K.Pathak "Electric Machines", Cengage Learning India (P) Ltd., Delhi, 2011.

CS6456 OBJECT ORIENTED PROGRAMMING

UNIT I OVERVIEW

WEEK 1: Why Object-Oriented Programming in C++

WEEK 2: Native Types and Statements

WEEK 3: Functions and Pointers, Implementing ADTs in the Base Language.

UNIT TEST-I

UNIT II BASIC CHARACTERISTICS OF OOP

WEEK 4: Data Hiding and Member Functions

WEEK 5: Object Creation and Destruction

WEEK 6: -Polymorphism data abstraction: Iterators and Containers
UNIT TEST-II

UNIT III ADVANCED PROGRAMMING

WEEK 7: Templates

WEEK 8: Generic Programming and STL

WEEK 9: -Inheritance-Exceptions,OOP Using C++.

UNIT TEST-III

UNIT IV OVERVIEW OF JAVA

WEEK 10: Data types, variables and arrays

WEEK 11: operators, control statements, classes,

WEEK 12: objects, methods –Inheritance

UNIT TEST-IV

UNIT V EXCEPTION HANDLING

WEEK 13: Packages and Interfaces

WEEK 14: Exception handling, multithreaded programming

WEEK 15: Strings, Input/Output

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. Ira Pohl, “Object-Oriented Programming Using C++”, Pearson Education Asia, 2003.
2. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifth edition, Prentice Hall of India private limited, 2003.

REFERENCES

1. Herbert Schildt, "The Java 2: Complete Reference", Fourth edition, TMH, 2002
2. Bjarne Stroustrup, “The C++ Programming Language”, Pearson Education, 2004.
3. Stanley B. Lippman and Josee Lajoie , “C++ Primer”, Pearson Education, 2003.
4. K.R.Venugopal, Rajkumar Buyya, T.Ravishankar, "Mastering C++", TMH, 2003.

EE6402 TRANSMISSION AND DISTRIBUTION

UNIT I STRUCTURE OF POWER SYSTEM

WEEK 1: Structure of electric power system: generation, transmission and distribution

WEEK 2: Types of AC and DC distributors, distributed and concentrated loads

WEEK 3: interconnection – EHVAC and HVDC transmission. Introduction to FACTS.

UNIT TEST-I

UNIT II TRANSMISSION LINE PARAMETERS

WEEK 4: Parameters of single and three phase transmission lines with single and double circuits - Resistance, inductance and capacitance of solid, stranded and bundled conductors,

WEEK 5: Symmetrical and unsymmetrical spacing and transposition - application of self and mutual GMD; skin and proximity effects

WEEK 6: interference with neighboring communication circuits - Typical configurations, conductor types and electrical parameters of EHV lines, corona discharges.

UNIT TEST-II

.**UNIT III MODELLING AND PERFORMANCE OF TRANSMISSION LINES**

WEEK 7: Classification of lines - short line, medium line and long line

WEEK 8: equivalent circuits, phasor diagram,attenuation constant , surge impedance; transmission efficiency and voltage regulation

WEEK 9:, real and reactive power flow in lines, Power - circle diagrams, surge impedance loading, methods of voltage control; Ferranti effect

UNIT TEST-III

.**UNIT IV INSULATORS AND CABLES**

WEEK 10: Insulators - Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators

WEEK 11: Underground cables - Types of cables, Capacitance of Single-core cable, Grading of cables

WEEK 12: Power factor and heating of cables, Capacitance of 3- core belted cable, D.C cables.

UNIT TEST-IV

UNIT V MECHANICAL DESIGN OF LINES AND GROUNDING

WEEK 13:Mechanical design of transmission line

WEEK 14: sag and tension calculations for different weather conditions, Tower spotting

WEEK 15: Types of towers, Substation Layout (AIS, GIS), Methods of grounding.

UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. D.P.Kothari , I.J. Nagarath, 'Power System Engineering', Tata McGraw-Hill Publishing Company limited, New Delhi, Second Edition, 2008.
2. C.L.Wadhwa, 'Electrical Power Systems', New Academic Science Ltd, 2009.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India

Pvt. Ltd, New Delhi, Second Edition, 2011.

REFERENCE BOOKS

1. B.R.Gupta, , S.Chand, 'Power System Analysis and Design'New Delhi, Fifth Edition, 2008.
2. Luces M.Fualken berry ,Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Hadi Saadat, 'Power System Analysis,' PSA Publishing; Third Edition, 2010.
4. J.Brian, Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering', Newnes; Fourth Edition, 2012.

5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press, 2013. **EE6403**

DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING

UNIT I INTRODUCTION

WEEK 1: Classification of systems: Continuous, discrete, linear, causal, stable, dynamic, recursive, time variance;

WEEK 2: classification of signals: continuous and discrete, energy and power; mathematical

representation of signals;

WEEK 3: spectral density, sampling techniques, quantization, quantization error, Nyquist rate, aliasing effect
UNIT TEST-I

UNIT II DISCRETE TIME SYSTEM ANALYSIS

WEEK 4: Z-transform and its properties, inverse z-transforms; difference equation

WEEK 5: Solution by z transform, application to discrete systems - Stability analysis, frequency response
WEEK 6: Convolution –Discrete Time Fourier transform , magnitude and phase representation.
UNIT TEST-II

.**UNIT III DISCRETE FOURIER TRANSFORM & COMPUTATION**

WEEK 7: Discrete Fourier Transform- properties

WEEK 8: Magnitude and phase representation, Computation of DFT using FFT algorithm

WEEK 9: DIT &DIF using radix 2 FFT – Butterfly structure.
UNIT TEST-III

UNIT IV DESIGN OF DIGITAL FILTERS

WEEK 10: FIR & IIR filter realization – Parallel & cascade forms. FIR design: Windowing Techniques

WEEK 11: Need and choice of windows – Linear phase characteristics. Analog filter design – Butterworth and Chebyshev approximations
WEEK 12: IIR Filters, digital design using impulse invariant and bilinear transformation - mWarping, pre warping.

UNIT TEST-IV

UNIT V DIGITAL SIGNAL PROCESSORS

WEEK 13:Introduction – Architecture – Features

WEEK 14: Addressing Formats – Functional modes

WEEK 15: Introduction to Commercial DSProcessors.
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. J.G. Proakis and D.G. Manolakis, 'Digital Signal Processing Principles, Algorithms and Applications', Pearson Education, New Delhi, PHI. 2003.
2. S.K. Mitra, 'Digital Signal Processing – A Computer Based Approach', McGraw Hill Edu, 2013.
3. Robert Schilling & Sandra L.Harris, Introduction to Digital Signal Processing using Matlab", Cengage Learning,2014.

REFERENCE BOOKS

1. Poorna Chandra S, Sasikala. B ,Digital Signal Processing, Vijay Nicole/TMH,2013.

2. B.P.Lathi, 'Principles of Signal Processing and Linear Systems', Oxford University Press, 2010

3. Taan S. ElAli, 'Discrete Systems and Digital Signal Processing with Mat Lab', CRC Press, 2009.

4. Sen M.kuo, woonseng…s.gan, "Digital Signal Processors, Architecture, Implementations & Applications, Pearson,2013

5. Dimitris G.Manolakis, Vinay K. Ingle, applied Digital Signal Processing,Cambridge,2012

6. Lonnie C.Ludeman ,"Fundamentals of Digital Signal Processing",Wiley,2013

EE6404 MEASUREMENTS AND INSTRUMENTATION

UNIT I INTRODUCTION

WEEK 1: Functional elements of an instrument

WEEK 2: Static and dynamic characteristics, Errors in measurement

WEEK 3:– Statistical evaluation of measurement data; Standards and calibration.
UNIT TEST-I

UNIT II ELECTRICAL AND ELECTRONICS INSTRUMENTS

WEEK 4: Principle and types of analog and digital voltmeters, ammeters, multimeters – Single and three phase wattmeters and energy meters
WEEK 5: Magnetic measurements – Determination of B-H curve and
measurements of iron loss
WEEK 6: Instrument transformers – Instruments for measurement of frequency

and phase.

UNIT TEST-II

.**UNIT III COMPARISON METHODS OF MEASUREMENTS**

WEEK 7: D.C & A.C potentiometers, D.C & A.C bridges, transformer ratio bridges,,

WEEK 8: Self-balancing bridges. Interference & screening

WEEK 9: Multiple earth and earth loops Electrostatic and electromagnetic interference – Grounding

techniques.

UNIT TEST-III

UNIT IV STORAGE AND DISPLAY DEVICES

WEEK 10: Magnetic disk and tape – Recorders

WEEK 11: digital plotters and printers, CRT display, digital CRO

WEEK 12: LED, LCD & dot matrix display – Data Loggers.
UNIT TEST-IV

UNIT V TRANSDUCERS AND DATA ACQUISITION SYSTEMS

WEEK 13: Classification of transducers – Selection of transducers

WEEK 14: Resistive, capacitive & inductive transducers – Piezoelectric, Hall effect, optical and digital transducers.
WEEK 15: Elements of data acquisition system – A/D, D/A converters – Smart sensors.
UNIT TEST-V

WEEK 16: MODEL PRACTICAL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS

1. A.K. Sawhney, ‘A Course in Electrical & Electronic Measurements & Instrumentation’,

Dhanpat Rai and Co, 2004.
2. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons, Delhi,2003.
3. Doebelin E.O. and Manik D.N., Measurement Systems – Applications and Design, Special IndianEdition, Tata McGraw Hill Education Pvt. Ltd., 2007..

REFERENCES

1. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, II Edition 2004.
2. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2007.
3. A.J. Bouwens, 'Digital Instrumentation', Tata McGraw Hill, 1997.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Hall of India, 2003

CS6461 OBJECT ORIENTED PROGRAMMING LABORATORY

LIST OF EXPERIMENTS

C++:

1. program using functions
   - functions with default arguments
   - implementation of call by value, address, reference
2. simple classes for understanding objects, member functions & constructors
   - classes with primitive data members,
   - classes with arrays as data members
   - classes with pointers as data members
   - classes with constant data members
   - classes with static member functions
3. compile time polymorphism
   - operator overloading
   - function overloading
4. run time polymorphism
   - inheritance
   - virtual functions
   - virtual base classes
   - templates
5. file handling
   - sequential access
   - random access

JAVA:

6. simple java applications
   - for understanding references to an instant of a class
   - handling strings in JAVA
7. simple package creation

- developing user defined packages in java

8. interfaces
   - developing user defined interfaces
   - use predefined interfaces
9. threading
   - creation of threading in java applications
   - multi threading
10. exception handling mechanism in java
    - handling predefined exceptions
    - handling user defined exceptions

EE6411 ELECTRICAL MACHINES LABORATORY – I

LIST OF EXPERIMENTS

1. Open circuit and load characteristics of DC shunt generator- critical resistance and critical speed.
2. Load characteristics of DC compound generator with differential and cumulative connections.
3. Load test on DC shunt and compound motor.
4. Load test on DC series motor.
5. Swinburne's test and speed control of DC shunt motor.
6. Hopkinson's test on DC motor – generator set.
7. Load test on single-phase transformer and three phase transformers.
8. Open circuit and short circuit tests on single phase transformer.
9. Polarity Test and Sumpner's test on single phase transformers.
10. Separation of no-load losses in single phase transformer.
11. Study of starters and 3-phase transformers connections.