Teaching Plan Jan'16

Name of the Faculty: Dr. JYOTI ANAND

Name of the Course: B.Sc. (H) Electronics

Semester : IV semester **Sec (if any)**: NA

Title of the Paper : Numerical Techniques

Month	Topics Covered	References
January	**Theory:-** **Errors:** Floating Point Representation of Numbers, Round off error, Truncation Error, Error propagation, Stability, Programming Errors. **Solution of Transcendental an Polynomial Equations:** Bisection Method, Secant and Regula Falsi Methods, Newton Raphson Method, Muller Method, General Iteration Methods,Rate of Convergence, Newton's Mehod for system of non linear equations, Method for Complex Roots. **Practical: Programs for Solution of Transcendental an Polynomial Equations:** Bisection Method**,** Secant and Regula Falsi Methods, Newton Raphson Method, **Program To find Complex Roots of Equations**	• S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India (2005) • M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods: Problems and Solutions, New Age International, (2007)
February	**Theory:-** **Interpolation and Polynomial Approximations:** Langrange Interpolation, Newton Divided Difference Interpolation (Forward and Backward Difference Formulae). **Curve Fitting**: Least Square fitting, Curve fitting, Interpolation by Spline functions. **Practical: Programs for Interpolation and Polynomial Approximation.** **Programs for Curve fitting.** **Test -I: 12th February, Friday (Tentative)** **Assignment-I: 5th February, Friday (Tentative)**	• S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India (2005) • M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods: Problems and Solutions, New Age International, (2007) • J. D. Mathews and K. D. Fink, Numerical Methods using MATLAB, Prentice Hall India (2005)

March	**Theory:-** **Numerical Integration:** Trapezoidal Rule, Error bounds and estimate for the Trapezoidal Rule, Simpson's Rule, error of Simpson's Rule. Gauss Integration Formula. **Numerical Differentiation**: Finite Difference Method. **Numerical Methods for First Order Differential Equations:** Euler-Cauchy Method, Heun's Method, Classical Runge Kutta method of Fourth Order, Method for system of Equations and Higher Order Equations. **Matrix Eigen Value**: Power Method **Practical: Programs for Trapezoidal and Simpson's Rule.** **Program for Numerical differentiation** **Program for Eulers Method & Runge Kutta Method.** **<u>Test -II: 18th March, Friday (Tentative)</u>** **<u>Assignment-II: 28th March, Monday (Tentative)</u>**	• S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India (2005) • M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods: Problems and Solutions, New Age International, (2007) • J. D. Mathews and K. D. Fink, Numerical Methods using MATLAB, Prentice Hall India (2005) • E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons (1999)
April	**Theory:-** **Numerical Methods in Linear Algebra:** Gauss Elimination Method, Partial pivoting, LU factorization, Doolittle's, Crout's and Cholesky's Methods, Matrix inversion, Gauss Jordon, Iterative Methods: Gauss Seidel mIteration, Jacobian Iteration. **Practical:- Program to find Roots of Real Equations** **<u>Assignment-III: 15th April, Friday (Tentative)</u>** **NOTE**: Remaining topics, if any & revision.	• S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India (2005) • M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods: Problems and Solutions, New Age International, (2007) • J. D. Mathews and K. D. Fink, Numerical Methods using MATLAB, Prentice Hall India (2005)

Teaching Plan

Name of the Faculty : Dr. Neha Sharma

Name of the Course : B.Sc (Hons.) Electronics IV Sem

Semester : Fourth Sec (if any) :NA

Title of the Paper : ELHT-402: Analog Electronics-II

Month	Topics Covered	References
January	Basic Operational Amplifier: Concept of differential amplifiers, block diagram of an operational amplifier (IC 741), Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio. Op-Amp in open and closed loop configuration: Frequency response of an op-amp in open loop and closed loop configurations	1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003) 2. S. Franco, Design with operational amplifiers and analog integrated circuits, Tata McGraw Hill (2002) 3. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
February	Inverting, Non-inverting, summing and difference amplifier, Integrator, Differentiator, voltage to current converter, current to voltage converter. Unit 2 Comparators: Basic comparator, Level detector, Voltage limiters, Regenerative comparator. Signal generators: Phase shift oscillator, Wien bridge oscillator, Schmitt Trigger, Square wave generator, triangle wave generator, sawtooth wave generator, Voltage controlled oscillator (IC 566), Phase locked loops (PLL). Date of Assignment submission 8th February 2016.	1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003) 2. S. Franco, Design with operational amplifiers and analog integrated circuits, Tata McGraw Hill (2002) 3. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
March	Multivibrators (IC 555): Block diagram, Astable and monostable multivibrator circuit, Voltage to frequency (V/F) and frequency and voltage (F/V) converter. Unit 4 Signal Conditioning circuits: Sample and hold systems Tentative test Date : 31st March 2016	1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003) 2. S. Franco, Design with operational amplifiers and analog integrated circuits, Tata McGraw Hill (2002) 3. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)

April	Active filters: First order low pass and high pass butterworth filter, Second order filters, Band pass filter, Band reject filter, All pass filter, Logarithmic and exponential amplifiers. Revision and Doubt discussions.	1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003) 2. S. Franco, Design with operational amplifiers and analog integrated circuits, Tata McGraw Hill (2002) 3. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)

Note : The tentative date of Assignment/test/Project may also be provided.

The schedule of Practicals may also be provided

Teaching Plan Jan-April 2016

Name of the Faculty: Mr. Himanshu Kushwah

Name of the Course: B.Sc. (H) Electronics

Semester : IV semester **Sec (if any)** : NA

Title of the Paper : Electromagnetics

Month	Topics Covered	References
January	**Theory:-** Vector Analysis: Scalars and Vectors, Vector Algebra, Rectangular (Cartesian) Coordinate System, Vector Components and Unit Vector, Vector Field, Products, Cylindrical Coordinates, Spherical Coordinates, Differential Length, Area and Volume, Line Surface and Volume integrals, Del Operator, Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian. Electrostatic Fields: Coulomb's Law and Electric Field Intensity, Field due to Continuous Charge Distribution, Line and Sheet of Charge. Electric Flux Density, Gauss's Law, Applications of Gauss's Law, Divergence Theorem and Maxwell's First Equation. **Practical: NA**	• M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001) • W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
February	**Theory:-** Energy and Potential: Energy in moving a point Charge in an Electric Field, Line Integral, Potential Difference and	• M. N. O. Sadiku, Elements of

	Potential, Potential due to a Point Charge, Potential Field of a System of Charges, Electric Field and Potential, the Dipole, Energy Density in an Electric Field. Electric Fields in Conductors: Current and Current Density, Continuity of Current, Metallic Conductors, Conductor Properties and Boundary Conditions, Method of Images. Dielectric Materials: Polarization in Dielectrics, Dielectric Constant, Linear, Homogeneous, Isotropic and Anisotropic Dielectrics, Boundary Conditions, Capacitance, Capacitance Examples, Capacitance of Two Wire Line. Poisson's Equation and Laplace's Equation: Derivation of Poisson's and Laplace's equation, Uniqueness Theorem, Examples of Solution of Laplace's Equation: Cartesian, Cylindrical and Spherical Coordinates. **Practical:- NA** **Test -I: 8th February,Monday (Tentative)**	Electromagnetics, Oxford University Press (2001) • W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006) • J. A. Edminster, Electormagnetics, Schaum Series, Tata McGraw Hill (2006)
March	**Theory:-** Magnetostatics: Biot Savert's law, Ampere's Circuital Law, Curl and Stoke's Theorem, Maxwell's Equation, Magnetic Flux and Magnetic Flux Density, The scalar and Vector Magnetic Potentials, Derivation of Biot Savert's and Ampere's Law. Magnetic Forces and Materials: Force on a moving Charge, Force on a Differential Current Element, Magnetic Torque and Momemt, Magnetic Dipole. Magnetization in Materials and Permeability, Anisotropic materials, Magnetic Boundary Conditions, Inductors and Inductances, Magnetic Energy, Magnetic Circuits. **Practical:-** NA **Assignment:15 th March,Monday**	• M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001) • W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
April	**Theory:-** Time Varying Fields: Faraday's and Lenz's Laws of Electromagnetic Induction: a stationary circuit in a time varying Magnetic Field, Transformer, a moving conductor in a Static Magnetic Field. Displacement Current, Maxwell's Equations: point and Integral form. Time Varying Potentials and Lorentz condition (Lorentz Gauge). **Practical:- NA** **Test-II : 28th March, Monday(Tentative)** **NOTE**:Remaining topics, if any & revision.	• M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001) • W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006) • J. A. Edminster, Electormagnetics, Schaum Series, Tata

		McGraw Hill (2006)

Teaching Plan Jan'16

Name of the Faculty: Dr. Monika Bhattacharya

Name of the Course: B.Sc(H) Electronics

Semester : IV semester **Sec (if any)** : NA

Title of the Paper : Data Structures

Month	Topics Covered	References
January	**Theory:-** • Review of C++ • Abstract Data Types • **Arrays**: Single and Multidimensional arrays, Sequential Allocation, Pointers **Practicals:-** • Programs in C++ to implement CLASSES • Programs to implement simple operations with arrays and strings (traversal insertion and deletion)	• Chapter 2, Jones and Barlett, Nell Dale, C++ Plus Data Structure (4th Edition) • Chapter1, Adam Drozdek, Data Structures and Algorithms in C++, Second edition, Vikas Publishing House .(second edition) • Chapter 1, Y Langsam, M J Avgenstein, A M Tenenbaum, Data Structures Using C and C++ , (PHI), 2008

February	**Theory:-**
	Algorithms and programs on various searching and sorting techniques
	Searching: Linear Search and Binary Search
	Sorting: Insertion sort, selection sort, bubble sort, merge sort
	Ist Internal Assessment Test (February 22, Moday) (tentative)
	Practical:
	Programs to implement
	• SEARCHING
	  ○ Linear Search
	  ○ Binary Search
		• Chapter 4 Schaum's Series in Data structures-Lipshutz, TMH (2006)
		• Chapter 9, Adam Drozdek, Data Structures and Algorithms in C++, Second edition, Vikas Publishing House (second edition)

March	• SORTING
	  ○ Insertion Sort
	  ○ Selection Sort,
	  ○ Bubble Sort,
	  ○ Merge Sort
	
	Theory:
	
	• LINKED LISTS
	
	Single, Double, Linear and Circular Linked Lists, Applications of Linked lists
	
	• STACKS
	
	Implementing stacks using linked lists, Applications of stacks
	
	• QUEUES
	
	Linked List Implementation of queues, Linear and Circular queues, Circular Buffers, Priority queues
	
	Assignment: 20th March (tentative)
	
	Test-II : 28th March, Monday(Tentative)
		• Chapter 5 and 6 Schaum's Series in Data structures-Lipshutz, TMH
		
		• Chapter 3 and 4, Adam Drozdek, Data Structures and Algorithms in C++, Second edition, Vikas Publishing House (second edition)

April	**Theory:** • Concept of a tree, Binary tree and its implementation in C++, Classification of binary trees, Applications of binary trees • Heap trees, Binary Search Trees (BSTs), Traversals and Search operation in BST, Divide and Conquer strategy to implement a BST, Degenerated BST, Height Balancing in trees (concept). **Practical:- Programs in C++ for implementation of TREES**	• Chapter -6 Adam Drozdek, Data Structures and Algorithms in C++, Second edition, Vikas Publishing House (second edition) • Chapter 4 Schaum's Series in Data structures-Lipshutz, TMH (2006)