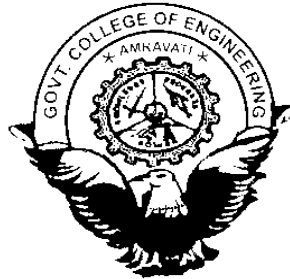


# **GOVT. COLLEGE OF ENGINEERING, AMRAVATI**



## **B. TECH. (Information Technology) III- IV Semester CURRICULUM**

**Department of Information Technology  
2009-10**

## INFORMATION TECHNOLOGY DEPARTMENT

### SCHEME FOR B.Tech. Information Technology

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	Internal	External		
<b>Semester- III</b>													
IT301	Engineering Mathematics- III	4	1	--	5	10	15	15	60	--	--	100	5
IT302	Discrete Mathematics and Graph Theory	4	1	--	5	10	15	15	60	--	--	100	5
IT303	Programming Methodology	4	-	--	4	10	15	15	60	--	--	100	4
IT304	Electronic Devices and Circuits	4	-	--	4	10	15	15	60	--	--	100	4
IT305	Microprocessor Fundamentals	4	--	--	4	10	15	15	60	--	--	100	4
IT306	Programming Methodology Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT307	Electronic Devices and Circuits Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT308	Microprocessor Fundamentals Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT309	Computer Laboratory- I	--	--	4	4	--	--	--	--	50	50	100	2
<b>Total</b>		<b>20</b>	<b>2</b>	<b>10</b>	<b>32</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>750</b>	<b>27</b>
<b>Semester- IV</b>													
IT401	Data Structures	4	--	--	4	10	15	15	60	--	--	100	4
IT402	Communication Engineering- I	4	--	--	4	10	15	15	60	--	--	100	4
IT403	Digital Integrated Circuits	4	--	--	4	10	15	15	60	--	--	100	4
IT404	Introduction to Information Theory	4	1	--	5	10	15	15	60	--	--	100	5
IT405	Numerical and Statistical Methods	4	--	--	4	10	15	15	60	--	--	100	4
IT406	Data Structures Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT407	Communication Engineering- I Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT408	Digital Integrated Circuits Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT409	Computer Laboratory- II	--	--	2	2	--	--	--	--	25	25	50	1
IT410	General Proficiency-I	--	--	2	2	--	--	--	--	25	25	50	2
<b>Total</b>		<b>20</b>	<b>1</b>	<b>10</b>	<b>31</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>750</b>	<b>27</b>

<b>Semester- V</b>													
IT501	System Analysis and Design	4	1	--	5	10	15	15	60	--	--	100	5
IT502	Operating System and Compiler Construction	4	0	--	4	10	15	15	60	--	--	100	4
IT503	Object Oriented Programming	4	--	--	4	10	15	15	60	--	--	100	4
IT504	Communication Engineering –II	4	--	--	4	10	15	15	60	--	--	100	4
IT505	Theory of Computation	4	0	--	4	10	15	15	60	--	--	100	4
IT506	System Analysis and Design laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT507	Operating System and Compiler Construction laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT508	Object Oriented Programming laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT509	Communication Engineering –II Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT510	General Proficiency-II	--	--	2	2	--	--	--	--	25	25	50	2
<b>Total</b>		<b>20</b>	<b>1</b>	<b>10</b>	<b>31</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>750</b>	<b>27</b>
<b>Semester- VI</b>													
IT601	Computer Network	4	0	--	4	10	15	15	60	--	--	100	4
IT602	Microprocessor Based Design	4	--	--	4	10	15	15	60	--	--	100	4
IT603	Data Base Management System	4	1	--	5	10	15	15	60	--	--	100	5
IT604	E-Commerce	4	0	--	4	10	15	15	60	--	--	100	4
IT605	Design and Analysis of Algorithms	4	--	--	4	10	15	15	60	--	--	100	4
IT606	Computer Network laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT607	Microprocessor Based Design laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT608	Data Base Management System Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT609	Design and Analysis of Algorithms Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT610	Minor Project	--	--	2	2	--	--	--	--	25	25	50	2
<b>Total</b>		<b>20</b>	<b>1</b>	<b>10</b>	<b>31</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>750</b>	<b>27</b>

Semester- VII													
IT701	Wireless Technology	4	--	--	4	10	15	15	60	--	--	100	4
IT702	Web Technology	4	--	--	4	10	15	15	60	--	--	100	4
IT703	Multimedia Technology	4	--	--	4	10	15	15	60	--	--	100	4
IT704	Embedded System	4	--	--	4	10	15	15	60	--	--	100	4
IT705	Elective –I	4	--	--	4	10	15	15	60	--	--	100	4
IT706	Embedded System Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT707	Multimedia Technology Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT708	Elective –I Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT709	Project and Seminar	--	--	6	6	--	--	--	--	50	50	100	4
<b>Total</b>		<b>20</b>	<b>--</b>	<b>12</b>	<b>32</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>750</b>	<b>27</b>
Semester- VIII													
IT801	Data Warehousing and Data Mining	4	--	--	4	10	15	15	60	--	--	100	4
IT802	Network Administration and Security	4	--	--	4	10	15	15	60	--	--	100	4
IT803	Elective – II**	4	--	--	4	10	15	15	60	--	--	100	4
IT804	Elective – III***	4	--	--	4	10	15	15	60	--	--	100	4
IT805	Data Warehousing and Data Mining Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT806	Elective – II** Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT807	Elective – III*** Laboratory	--	--	2	2	--	--	--	--	25	25	50	1
IT808	Project and Seminar	--	--	8	8	--	--	--	--	100	100	200	8
<b>Total</b>		<b>16</b>	<b>--</b>	<b>14</b>	<b>30</b>	<b>40</b>	<b>60</b>	<b>60</b>	<b>240</b>	<b>175</b>	<b>175</b>	<b>750</b>	<b>27</b>

TA :Teacher Assessment

CT: Class Tests

ESE: End Semester Examination

Duration of ESE: 2hrs.30min

**Elective I (IT705)**

Distributed Computing  
Optical and Satellite Communication  
Digital Signal Processing

**Elective II (IT803)**

Computer Graphics  
Digital Image Processing  
Artificial Intelligence

**Elective III(IT804)**

Artificial Neural Network  
Advanced Web Technology  
Software Planning and Management with Object Oriented Approach

## IT301 ENGINEERING MATHEMATICS-III

Teaching Scheme: 04 L + 01 T

TOTAL 05

Credits : 05

Marking scheme: 15CT1 + 15CT2 + 10TA + 60 ESE

Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

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### **Linear Differential Equations with constant coefficients:**

General solution to L.D.E. of  $n^{\text{th}}$  order with constant coefficients, rules for finding C.F., General method for finding P.I., P.I. of some standard functions, Method of Variation of Parameters, Cauchy's and Legendre's L.D.E., simultaneous linear differential equations . Applications of L.D.E.: Electrical Circuits, Kirchoff's Law, LCR Circuits, Coupled Electrical Circuits.

### **Partial Diff. Equations:**

Definition, formation of P.D.E., complete solution of PDE, Linear and non-linear PDE of types (i)  $f(p, q) = 0$ , (ii)  $f(p, q, z) = 0$ , (iii)  $f(p, q, x, y) = 0$ , (iv)  $f(p, q, x, y, z) = 0$  ie Lagrange's form  $Pp + Qq = R$  and Clairaut's form  $z = px + qy + f(p, q)$ , (v) Equations reducible to above forms. Complete solution of PDE of first and second order by method of separation of variables.

**Laplace Transform:** Definition, standard formulae and properties of LT., Laplace transform of unit step and periodic functions. Laplace Transform of unit impulse function., Inverse Laplace Transform, Convolution Property, Application of LT to solve LDE with constant coefficients.

### **Vector Calculus:**

Scalar and vector point functions, Differentiation of a vector function, Tangent and normal components of velocity and acceleration, orthogonal curves, Operator delta, Gradient of scalar point function & their physical meaning . Divergence and Curl of vector point function & their physical meaning. vector identities, solenoidal and conservative fields. Line integral, work done by force.

### **Functions of complex variables:**

Analytic function, C-R equations (Cartesian & polar), Harmonic function, Milne Thompson method for finding analytic function, conformal mappings, Bilinear transformation.

### **Text Books :**

- 1) Text book of applied Mathematics by P.N.Wartikar and J.N.Wartikar, Pune vidyarthi griha, Pune 2001.
- 2) Higher Engineering Mathematics by B.S.Grewal, Khanna publication, 6<sup>th</sup> edition, New Delhi, 1976.

### **Reference Books:**

- 1) Advanced Engineering Mathematics by Kreyzig, John Wiley & sons 9<sup>th</sup> edition 1995.
- 2) Advanced Engineering Mathematics by John bird 5<sup>th</sup> edition Elsevier publication 2007.
- 3) Higher Engineering mathematics by C.R.Wiley, 8<sup>th</sup> edition John Wiley and sons 1999.

## IT302 DISCRETE MATHEMATICS AND GRAPH THEORY

Teaching Scheme : 04 L + 01 T

Total 05

Credit : 05

Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60

ESE Total Marks :100

Duration of ESE : 2 Hrs.30 min.

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**Mathematical Logic:** statements & Notations, Connectives, Normal Forms, theory of inference for the statement calculus: validity using truth tables, predicate calculus.

**Set theory:** Operation on sets, Algebra of sets. Relation and Ordering, Functions, Recursive functions. Sets and predicates.

**Algebraic structure:** Semi groups and Monoids, Product and quotations of semi groups, Grammar and Languages, Polish expression and their compilation, Groups, Products and quotations of groups.

**Lattice and Boolean Algebra:** Lattices, Partially ordered sets, Boolean functions as Boolean Polynomials, Minimization of Boolean functions.

**Graph theory:** Basic concepts, paths, reach ability and connectedness, Matrix Representation of graphs. Trees: tree searching, undirected trees, Minimal spanning tree.

**Computability theory:** Finite state machines, Finite state acceptors and regular grammars. Turing machines and partial recursive functions.

**Text Book:**

1) Discrete Mathematical Structures with application to Computer science by J.P.Trembley, R.Manohar: 2<sup>nd</sup> Edition , Tata Mc-Graw Hill Publication, 2004 .

**Reference Books:**

1) Element of Discrete Mathematics by C.L.Lill second edition Mc-Graw Hill,2002.

## IT303 PROGRAMMING METHODOLOGY

Teaching Scheme : 04 L Total 04

Credit : 04

Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks :100

Duration of ESE : 2 Hrs.30 min.

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**Introduction:-** Computer Languages, procedural Vs Object oriented language. Software Engineering and SDLC. Java Basics: Program component, Compilation cycle. Introducing classes, class fundamentals, declaring objects, methods, class data, instance data, and constructor. Introduction to Applet and Application,

**Operators:** Arithmetic operators, relational operators, assignment operators. Data types and variables

**Control statement:-** Selection statement: if, nested if, switch statement. Repetition statements: while, do-while, for, nested loops. Introduction to Math class.

**Arrays:** Basics, one dimensional, Multidimensional, array of Objects, Passing array to methods. this keyword, access control. Introduction to String and String buffer class Applet class and its methods.

**Introduction to AWT and classes of AWT:** Button, Text field, Label. Working with Graphics, Working with Colors.

**AWT control fundamentals:** adding and removing of controls, responding to controls. Frame class, menus and other GUI objects. Event handling mechanism, Delegation event Model.

**Event, Event Listeners:** ActionListener, MouseListener, MouseMotion Listener, WindowListener. Handling mouse event. Adapter classes. Inheritance, Polymorphism, Abstract classes and Interface, Package.

**Java file I/O:** File Dialog object, Low and high level file I/O., the stream classes, byte stream: Input stream, Output stream, File Input stream, File output stream. Data Input/Output stream. PrintWriter, Exceptions using try and catch, throw, throws, finally.

**Text Book:**

- 1 Java Complete References By Herbert Schildt , 3<sup>rd</sup> Edition, Mc Graw-Hill, 2003.
- 2 An Introduction to OOP with Java By C.Thomas Wu, 2<sup>nd</sup> Edition, Mc Graw-Hill,1988.

**Reference Book:**

- 1.Java Programming By Liag. 2<sup>nd</sup> Edition, Prentice Hall,2004.

## **IT304 ELECTRONIC DEVICES AND CIRCUITS**

**Teaching Scheme : 04 L**

**Total 04**

**Credit : 04**

**Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE**

**Total Marks :100**

**Duration of ESE : 2 Hrs.30 min.**

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**Diodes :** Characteristics of semiconductor diodes, diode resistance. Rectifying circuits. HWR, FWR, BR comparison. Filter circuits for power supplies: Inductor, Capacitor, LC, C, CLC Filters.

**Concept of amplification:-**  $A_i$ ,  $A_v$  and  $A_p$ ;  $R_i$ ,  $R_o$ . Conversion efficiency. Basic transistor operation, Basic characteristics of transistor amplifier. Transistor input and output characteristics, (CB,CE) .

**The CE amplifier** Graphical analysis, Input & output resistance, Input waveform consideration, Comparison of amplifiers. Transistor biasing: Stability Factor, CB bias, Fixed Bias, Voltage divider Bias, Bias compensation techniques

**Oscillators:** Effect of positive feedback. RC Oscillator, Wein-Bridge oscillator, Transistor as a switch, switching time in transistors, Multivibrators.

**FET amplifiers:** Advantages & disadvantages of FET. Principle of operation, characteristics, Common source AC amplifier. Fixed Bias. Source follower, Frequency Response, MOSFETS.

**Opto Electronic Devices :** Fundamentals of light, photoconductive sensors, photodiodes, phototransistors, their principle of operation & applications. photovoltaic sensors. photoemission sensors. Light emitters, alphanumeric displays. Photocoupler, SCR, TRIAC, DIAC, OPAMP.

**Text Books:**

1. Principles of Electronics By Malvino ,5<sup>th</sup> Edition Mc Graw Hill,1993.
2. Electronic Devices & Circuits by Millman & Halkies 1<sup>st</sup> Edition ,McGrawHill,1993.

**Reference Books:**

3. Integrated Electronics By Millman & Halkies ,2<sup>nd</sup> Edition ,Mc Graw Hill,1986.

## IT305 MICROPROCESSOR FUNDAMENTALS

Teaching Scheme : 04 L

Total 04

Credit : 04

Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks :100

Duration of ESE : 2 Hrs.30 min.

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**Internal Architecture of Microprocessor:** Software Model Segment Register, Data Register, Index Register, Pointer Register, and Status Register Memory Segmentation. Real address Mode. Stack and I/O Address Space.

**Addressing Modes:**-Arithmetic and Logic Instructions: Addition, Subtraction, and Comparison, Multiplication and Division, BCD and ASCII Arithmetic, Basic Logic Instructions, Shift and Rotate, String Comparisons.

**Program Control Instructions:** Flag control instruction, Compare instruction, control flow and jump instruction, Subroutines and related instruction, Loops and loop handling instruction, 8086 programming using these instruction.

**8086-interrupt mechanism:** types and priority. Interrupt vector table, interrupt instruction. Enabling disabling interrupt. External hardware interrupt interface signal. External hardware interrupts sequence. Software interrupts .Non maskable interrupts Reset, internal interrupt function. Basic DMA using HOLD HLDA and READY.

**8086 minimum mode and Maximum mode** system and interface signals. Bus cycle and time state. 8086 I/O: types of input output, isolated I/O interface, input output data transfer, I/O instruction and bus cycle.

### **Co-processor Configuration**

Closely coupled and loosely coupled system, system bus and residence bus mode, I/O Bus system and use of bus controller and bus arbiter: Daisy chaining and parallel priority resolution., DOS, BIOS function calls: Video, keyboard, printer, command line application. Introduction to PVA including Protected mode and paging .

### **Text Book:**

1. The 8088/8086 Microprocessor by Liu and Gibson, 2<sup>nd</sup> Edition, Prentice Hall,1989.
- 2.8086/8088 Families: Design, Programming and Interfacing by Uffenbeck John.P 3<sup>rd</sup> Edition ,Prentice Hall,1987.

### **References :**

- 1.The Intel Microprocessor Architecture, Programming and Interface Barry B. Brey: 6<sup>th</sup> Prentice Hall,1991.
2. The 8088/8086 Microprocessor by W.A.Triebel and Avatar Singh 4<sup>th</sup> Edition, Prentice Hall,2000.
- 3.The Pentium Processor, by James Antonokos, 2<sup>nd</sup> Edition Pearson Education,1995.



## **IT306 PROGRAMMING METHODOLOGY LABORATORY**

**Teaching Scheme : 02 P**

**Total 02**

**Credit : 01**

**Evaluation Scheme : 25 INT + 25 EXT**

**Total Marks :50**

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**The sample list of program is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same Aim of the list is to inform about minimum expected outcomes.**

- 1) Simple Java applications using any Selection statement.
- 2) Simple Java applications using any Repetition statement.
- 3) Java application to Using Math class
- 4) Applet program using concept working with Graphics and Colors
- 5) Applet program using GUI components Button, TextField, Label.
- 6) Applet program for BMI calculation.
- 7) Java application based on String and String buffer class
- 8) Java application to implement Frame and Dialog window.
- 9) Write an application in Java to design “Calculator”
- 10) Java application program based on Mouse events.
- 11) Java Application program based on reading and writing of files.

## **IT307 ELECTRONIC DEVICES AND CIRCUITS LABORATORY**

**Teaching Scheme : 02 P**

**Total 02**

**Credit : 01**

**Evaluation Scheme : 25 INT + 25 EXT**

**Total Marks :50**

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**The sample list of program is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same Aim of the list is to inform about minimum expected outcomes.**

- 1) To verify V-I characteristics of PN junction diode.
- 2) To study V-I characteristics of LED
- 3) To study rectifier.
- 4) To study filter.
- 5) To study switching action of transistor.
- 6) To study biasing method.
- 7) To study input and output characteristics of common emitter configuration.
- 8) To study amplifier using transistor.
- 9) To verify char of MOSFET.
- 10) To study wine bridge oscillator.

## **IT308 MICROPROCESSOR FUNDAMENTALS LABORATORY**

**Teaching Scheme : 02 P**

**Total 02**

**Credit : 01**

**Evaluation Scheme : 25INT + 25 EXT**

**Total Marks :50**

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Minimum **Fifteen** Practical based on:

Arithmetic and Logic Instructions,  
Shift and Rotate, String,  
Control flow and jump instruction,  
Subroutines, Loops and loop handling instruction,  
DOS, BIOS function calls: Video, keyboard, printer, and command line application.  
And kits based Experiment.  
Conduct the above mentioned practical on TASM software and Kit.

### **IT309 COMPUTER LABORATORY -I**

**Teaching Scheme : 04 P**

**Total 04**

**Credit : 02**

**Evaluation Scheme : 50 INT + 50 EXT**

**Total Marks :100**

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Minimum 15 Experiments based on Red Hat Linux on following topics:-

1. File and shell Basics
2. User and Group
3. File access permissions
4. Linux File System
5. String processes
6. Standard I/O and Pipes
7. Introduction to process
8. X/GNOME/KDE
9. Printing and mailing
10. Basic networking
11. Using vi editor
12. System tool Installation

### **IT401 DATA STRUCTURES**

**Teaching Scheme : 04 L**

**Total 04**

**Credit : 04**

**Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE**

**Total Marks :100**

**Duration of ESE : 2 Hrs.30 min.**

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**Introduction, Data structures, algorithms:** complexity, Time-Space, Tradeoff, Mathematical notation and functions, Algorithmic notation, complexity of algorithm, sub algorithm, String processing: Basic terminology, storing Strings, character data type, String operations, word processing, pattern matching algorithms.

**Arrays, Records and Pointers:** Introduction, Linear arrays, representation of linear arrays in memory, traversing linear arrays, inserting and deleting, sorting; Bubble sort, searching; Linear search, Binary search, multidimensional arrays, Pointers; Pointer arrays, records; record structures, representation of records in memory; parallel arrays, Matrices, Sparse matrices.

**Linked List:** Linked lists, representation of linked lists in memory, traversing a linked list, searching a linked list, memory allocation; garbage collection, insertion into a linked list, Deletion into a linked list, Header Linked list, Two- Way Lists.

**Stacks, Queues, Recursion:** Introduction, Stacks, Array representation of stacks, Arithmetic expressions; Polish notation, Quick sort, an application of stacks, Recursion, Towers of Hanoi, Implementation of Recursive Procedures by Stacks, Queues, Dequeues, Priority Queues.

**Trees:** Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Traversal Algorithms Using Stacks, Header Nodes; Threads, Binary Search Trees, Deleting in a Binary Search Tree, Heap; Heapsort, Path Lengths; Huffman's Algorithm, General Trees.

**Graphs and their applications:** Introduction, Graph Theory Terminology, Sequential Representation of Graphs; Adjacency Matrix; Path Matrix, Warshall's Algorithm; Shortest Paths, Linked Representation of a Graph, Operation on Graphs, Traversing a Graph, Posets; Topological Sorting, Sorting and Searching: Insertion Sort, Selection Sort, Merging, Merge-Sort, Redix- Sort, Hashing.

**Text Book :**

1.Data structures by Trembley and Sorenson 3<sup>rd</sup> Edition, Tata McGraw Hill,1986.

**Reference Book:**

1. Theory and Problems of Data Structures by S. Lipschutz, SCHAUM'S OUTLINE SERIES, 2<sup>nd</sup> Edition , Tata McGraw Hill,1986.

2. Data Structures by Horowitz and Sahni 2<sup>nd</sup> Edition,Galgotia Publication,1992.

## IT402 COMMUNICATION ENGINEERING – I

**Teaching Scheme : 04 L**

**Total 04**

**Credit : 04**

**Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE**

**Total Marks :100**

**Duration of ESE : 2 Hrs.30 min.**

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**Basic Communication:** Definition Of A Signal, Electronic Communication, Electromagnetic Frequency Spectrum, Bandwidth, Speech Signal, Voice Signal, Types Of Electronics Communication, Communication System: Basic Block Diagram Of Communication System, Requirement Of Bandwidth, Channel, Types Of Channel, Noise: External And Internal Noise, Noise Figure, Signal To Noise Ratio, Noise Figure Measurement.

**Modulation:** What Is Modulation, Need Of Modulation, Types Of Modulation, Amplitude Modulation And Frequency Modulation. Amplitude Modulation Theory, Frequency Spectrum Representation Of Am, Modulation Index Side Bands, Power Relations, Current Relations And Voltage Relation In The Am Wave.

Frequency Modulation And Phase Modulation, Frequency Deviation, Modulation Index, Frequency Spectrum.

**Am Transmitters:** Principles Of Dsb-Fc, Dsb-Sc, Ssb-Sc Modulation And Their Comparison, Details Of Dsb-Fc Transmitter, Generation Of Dsb-Sc By Using Balanced Modulators (Fet & Diodes), Dsb-Sc Transmitter. Generation Of Ssb-Sc By Phase-Shift Method.

**Am Receivers :**Trf Receiver, Superhetrodyne Receiver, Details Of Each Block Such AsRf Amplifier, Oscillator, If Amplifier, Diode Detector, Audio Amplifier,Mixer, Principle,Need And Type Of Agc, Practical Radio Receiver Circuit With Agc, Characteristics Such As Selectivity, Sensitivity, And Fidelity Communication Receiver

**Fm Transmitter** :Circuits For Direct Fm Generation Using Fet And Varactor Diode. Circuit & Analysis Of Indirect Fm Generation, Narrow Band And Wide Band Fm, Their Comparison, De- Emphasis And Pre-Emphasis. Fm Transmitter & Stereo Fm Transmitter.

**Fm Receivers** : Details Of Fm Receiver, Blocks Such As Rf Amplifier, Local Oscillator, If Amplifier, Mixer, Audio Ampl. Agc, Limiter, Fm Discriminator, Single Slope And Balanced Slope Detector, Analysis Of Foster Seeley And Ratio Detectors, Stereo Fm Receiver.

**Text Book :-**

1. Electronics Communication System by Kennedy G., 3<sup>rd</sup> Edition, Tata Mcgraw Hill, 1985

**Reference Book:**

1. Electronic Communication By Shrader 6<sup>th</sup> Edition, 1991.

2. Electronic Communication By Lloid Temes, Mitchel Schultz Shaum's Outlines, 2<sup>nd</sup> Edition, 1997.

3. Electronic Communications By Dennis Roddy And John Coolen 4<sup>th</sup> Edition, 1992.

4. Electronic Communications Systems By Wayne Tomasi 6<sup>th</sup> Edition, 1998.

5. Communication Electronics By Frenzel. 3<sup>rd</sup> Edition, 1994.

## **IT403 DIGITAL INTEGRATED CIRCUITS**

**Teaching Scheme : 04 L**

**Total 04**

**Credit : 04**

**Evaluation Scheme : 15 CT1 + 15 CT2 + 10 TA + 60 ESE**

**Total Marks : 100**

**Duration of ESE : 2 Hrs. 30 min.**

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**Review of Boolean Algebra & Boolean Functions.** Canonical & standard forms. Digital Logic Gates.

**Digital Integrated Circuits:** Special characteristics like fan-out, power dissipation, propagation delay & noise margin. Bipolar transistor characteristics. TTL, ECL, MOS and CMOS families : Basic circuits, operation and typical characteristics.

**Simplification of Boolean functions:** The K-Map method, two- & three-Variable maps, four-variable map, five-variable map. POS simplification. NAND & NOR implementations. Other two-level implementations. Don't-care conditions. Tabulation method. Determination of prime implicants. Selection of Prime implicants.

**VHDL Modeling Concepts:** VHDL Fundamentals, Constants, Variables, Scalar types, Type Classification, Expressions, Operators, Sequential Statements, If, Case, Null, Loop, Assertion, Reports statements.

**Array & VHDL:** Unconstrained array types, Array operations & referencing, Records Basic Modeling constructs: Entity declarations, Architecture bodies, Behavioral descriptions, Structural descriptions, Design processing.

**Combinational Logic:** introduction. design procedure. adders. subtractors. Code conversion. analysis procedure. Multilevel NAND circuits : universal gate, Boolean-function implementation. Multilevel NOR circuits: universal gate, Boolean-function implementation. Exclusive-OR functions. Odd function. Parity generation & checking. Combination Circuits implementation using VHDL

**Synchronous Sequential circuits:** introduction, Flip-Flops: basic circuits, RS-, D-, JK- & T- Flip-Flops. Triggering of flip-flops. Analysis of clocked sequential circuits. State reduction & assignment. Flip-flop excitation table. Design procedure.

**Design of counters:** ripple counters, synchronous counters. Asynchronous sequential circuit implementation using VHDL.

**Text Book:**

1. Digital Design by M.Morris Mano ,2<sup>nd</sup> Edition,PHI,2001.
- 2.The Designer's Guide to VHDL, by Peter J.Ashenden, 2<sup>nd</sup> Edition Harcourt Asia,1996.

**Reference Book:**

1. Digital Integrated Electronics by Taub & Schilling 3<sup>rd</sup> Edition ,TMH,1977.
- 2.Modern Digital Electronics by Jain R.P.2<sup>nd</sup> Edition ,TMH,2003.
- 3.An Engineering Approach to Digital Design, by Fletcher W.I.2<sup>nd</sup> Edition,PHI,1997

### **IT404 INTRODUCTION TO INFORMATION THEORY**

**Teaching Scheme : 04 L +01 TU                      Total 05                      Credit : 05**  
**Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE                      Total Marks :100**  
**Duration of ESE : 2 Hrs.30 min.**

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**Foundations:** probability, uncertainty, information. Concepts of randomness, redundancy, compressibility, noise, bandwidth, and uncertainty related to information. Ensembles, random variables, marginal and conditional probabilities.

**Entropies and measures of information.** Marginal entropy, joint entropy, conditional entropy, and the Chain Rule for entropy. Mutual information between ensembles of random variables.

**Source coding theorem, prefix, variable and fixed-length codes:** Symbol codes, The binary symmetric channel, Capacity of a noiseless discrete channel, Error correcting codes.

**Channel types, properties, noise, and channel capacity:** Perfect communication through a noisy channel, Capacity of a discrete channel as the maximum of its mutual information over all possible input distributions.

**Continuous information, density, noisy channel coding theorem:** Extensions of the discrete entropies and measures to the continuous case, Signal-to-noise ratio, power spectral density, Gaussian channels, Relative significance of bandwidth and noise limitations, The Shannon rate limit and efficiency for noisy continuous channels.

**TextBook**

- 1.Elements of information theory. Cover, T.M. & Thomas J.A.NewYork: Wile1991.

### **IT405 NUMERICAL AND STATISTICAL METHODS**

**Teaching Scheme : 04 L                      Total 04                      Credit : 04**  
**Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE                      Total Marks :100**  
**Duration of ESE : 2 Hrs.30 min.**

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**Problem solving & computers,** Numerical method for root of equations, polynomial, transcendental, quadratic equations. Bisection, False Position, Newton-Raphson & Direct substitution methods.

**Solution of Simultaneous Equations:** Gauss Elimination, Gauss Seidel, Gauss-Jordan Methods. Matrix methods.

**Inversion Interpolation:** Linear Polynomial. Numerical differentiation by polynomial fit, Numerical Integration by Trapezoidal Rule, Simpson Rule, Gaussian Quadrature. Taylor's series, Picard's method, Euler's Method, Runge-Kutta Method, Predictor-Corrector Method.

**Sampling frequency** distribution, measures of central tendency, dispersion moments. Discrete probability, distributions. Probability, Various types of distributions.

**Regression:** Linear LS fit, Nonlinear fit. Polynomial Function Correlation: Coefficient, Properties of Correlation coefficient. Multiple, Partial and Rank Correlation.

**Text Book:**

1. Computer Numerical Methods by V.Rajaraman 3<sup>rd</sup> Edition, Prentice Hall, 2004.
2. Mathematical Statistics by J.N.Kapoor: 5<sup>th</sup> Edition, MaC Graw, 1991.

**Reference Book:**

1. Numerical Computation Methods by Sastry: 2<sup>nd</sup> Edition, Prentice Hall, 2005.
2. Statistics by M.R.Spiegel: 3<sup>rd</sup> Edition McGraw-Hill, 1961.

### **IT406 DATA STRUCTURES-LABORATORY**

**Teaching Scheme : 02 P**

**Total 02**

**Credit : 01**

**Evaluation Scheme : 25 INT + 25 EXT**

**Total Marks :50**

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**The sample list of program is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes**

List of Practical

- 1) Store and print the nonzero elements of sparse matrix using given format Transpose the sparse representation using given algorithm.
- 2) Simulate any algorithm based on recursion
- 3) Define and Implement functions of Abstract data type
- 4) Evaluate Postfix/prefix type of expression.
- 5) Linked representation of data structure Queue
- 6) Perform the operations such as insert a node at first, insert a node at given location, delete on data structure Singly linked list
- 7) Perform the operations such as insert a node at first, insert a node at given location, delete data structure Doubly linked list
- 8) Traverse the binary tree using any one preorder/ postorder / inorder traversal
- 9) Sort the given array using Selection Sort

### **IT407 COMMUNICATION ENGINEERING- I LABORATORY**

**Teaching Scheme : 02 P**

**Total 02**

**Credit : 01**

**Evaluation Scheme : 25 INT + 25 EXT**

**Total Marks :50**

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- 1) Measurement of signal to noise ratio.

- 2) AM generation using DSB-SC
- 3) Measurement of modulation index of AM wave
- 4) Measurement of carrier amplitude of AM wave
- 5) Single side band generation
- 6) FM Modulation index
- 7) AM transmitter using cable/antenna
- 8) Voice transmission over AM
- 9) FM transmitter using Cable/Antenna
- 10) AM Modulation

### **IT408 DIGITAL INTEGRATED CIRCUITS LABORATORY**

<b>Teaching Scheme : 02 P</b>	<b>Total 02</b>	<b>Credit : 01</b>
<b>Evaluation Scheme : 25 INT + 25 EXT</b>		<b>Total Marks :50</b>

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**Minimum Ten Practical based on :**

Combinational Logic and Synchronous Sequential circuits design using structural, Behavioral and data flow architectures for the following.

Adders. subtractors. Code converter. Parity generation & checking.

**Counters:** ripple counters, synchronous counters etc using VHDL and synthesize and simulate.

### **IT 409 COMPUTER LABORATORY-II**

<b>Teaching Scheme : 02 P</b>	<b>Total 02</b>	<b>Credit : 01</b>
<b>Evaluation Scheme : 25INT + 25 EXT</b>		<b>Total Marks :50</b>

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Minimum 15 Experiments based on RedHat Linux on following topics:-

**System Administration**

1. Hardware device configuration and Installation
2. Linux File system
3. System Initialization and services
4. User administration
5. Network configuration
6. System admin tool
7. Alternate installation methods
8. Kernel services software raid
9. Troubleshooting

### **IT410 GENERAL PROFICIENCY-I**

<b>Teaching Scheme : 02 P</b>	<b>Total 02</b>	<b>Credit : 02</b>
<b>Evaluation Scheme: 25INT + 25 EXT</b>		<b>Total Marks :50</b>

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**Objective :**

On completion of this laboratory the candidate should be able to demonstrate adequate skills in oral and written communication for technical English language, actively participate in group discussions and interviews and exhibit the evidence of vocabulary building. Candidates should be assessed through continuous monitoring and evaluation.

**The sample list of experiments is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same Aim of the list is to inform about minimum expected outcomes.**

1. Assignments and tests for vocabulary building
2. Technical report writing
3. Group discussions
4. Interview techniques
5. Projects and tasks such as class newsletter
6. Writing daily diaries and letters
7. Interactive language laboratory experiments.

**Text Book:**

1. Word Power Made Easy , Norman Lewis

**<http://www.teachingenglish.org.uk>**