

III to VIII Semester B.E.  
(Information Technology)

Prospectus No.101716

PUBLISHED BY  
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संत गाडगे बाबा अमरावती विद्यापीठ

**SANT GADGE BABA AMRAVATI UNIVERSITY**

(FACULTY OF ENGINEERING & TECHNOLOGY)

## PROSPECTUS

PRESCRIBED FOR  
FOUR YEAR DEGREE COURSE  
BACHELOR OF ENGINEERING  
INFORMATION TECHNOLOGY  
III TO VIII SEMESTER  
EXAMINATIONS, 2009-2010  
SEMESTER PATTERN



2009

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SYLLABUS

PRESCRIBED FOR  
BACHELOR OF ENGINEERING  
INFORMATION TECHNOLOGY  
III TO VIII SEMESTERS

SEMESTER PATTERN

THIRD SEMESTER

**Inplant Training & Industrial Visit** in the faculty of Engineering & Technology

- 1)
  - a) the inplant training shall not be compulsory,
  - b) the inplant training shall be taken by students strictly during Summer vacation. after IVth or VIth Semester examination and / or during Winter vacation after Vth or VIIth Semester examinations,
  - c) the inplant training shall not be part of examination system, however, student shall prepare and submit report after completion of training to the concerned Head of Department alongwith certificate issued by the industry,
  - d) the inplant training shall be of minimum two weeks duration,
  - e) there shall not be any liability whatsoever on the Institution with respect to inplant training of the students,
  - f) students shall undertake inplant training on their own risk and cost. An undertaking in this regards signed by student and parents shall be submitted before proceeding for training to the concerned Head of Department/ Head of Institution.
  - g) the students shall complete inplant training under the supervision of concerned person in the industry,
  - h) Institutes shall help students to organise inplant training by way of correspondance,
- 2) Industrial Visit : Industrial visit may be organised for the students. Students should prepare & submit the report on Industrial visit to the concerned Head of Department/Head of Institution.

3SRN1

MATHEMATICS-III

SECTION-A

- UNIT-I **Ordinary differential equations:-** Complete solution, Operator D, Rules for finding complementary function, the inverse operator, Rules for finding the particular integral, Method of variations of parameters, Cauchy's and Legendre's linear differential equations. (10 Hrs.)

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UNIT-II **Laplace transforms:-** definition, standard forms, properties of Laplace transform, inverse Laplace transform, initial and final value theorem, convolution theorem, Laplace transform of impulse function, Unit step function, Laplace transforms of periodic function Solution of Linear differential equations, Simultaneous differential equation by Laplace transform method. (10 Hrs.)

UNIT-III a) **Difference equation:-** solution of difference equations of first order Solution of difference equations of higher order with constant co-efficients,

b) **Z-transform:-** Definition, standard forms, Z-transform of impulse function, Unit step functions, Properties of Z-transforms (linearity, shifting, multiplication by k, change of scale), initial and final values, inverse Z-transforms (by direct division and partial fraction), Solution of difference equation by Z-transforms. (10 Hrs.)

SECTION-B

UNIT-IV a) **Fourier transforms:-** Definition, standard forms, inverse Fourier transforms, properties of Fourier transforms, convolution theorem, Fourier sine and Fourier cosine transforms and integrals.

b) **Partial differential equation of first order of following form:-**  
(i)  $f(p,q)=0$ ; (ii)  $f(p,q,z)=0$ ; (iii)  $f(x,p)=g(y,q)$ ; (iv)  $Pp+Qq=R$  (Lagrange's Form); (v)  $Z=px+qy+f(p,q)$  (Clairaut form) (10 Hrs.)

UNIT-V **Complex Analysis :-** Functions of complex variables, Analytic function, Cauchy-Reimann conditions, Harmonic function, Harmonic conjugate functions, Milne's method conformal mappings (translation, rotation, magnification, and bilinear transformation), singular points, expansion of function in Taylor's and Laurent's series. (10 Hrs.)

UNIT-IV **Vector calculus:-** Scalar and vector point functions, Differentiation of vectors, Curves in space, Gradient of a scalar point function, Directional derivatives, Divergence and curl of a vector point function and their physical meaning, expansion formulae (with out proof), line, surface, volume integrals, irrotational and solenoidal vector fields. (10 Hrs.)

BOOKS RECOMMENDED:-

- 1) Elements of Applied Mathematics by P.N. Wartikar and J.N. Wartikar
- 2) A Text Book of Differential Calculus by Gorakh Prasad.

- 3) Engg. Mathematics by Chandrika Prasad.
- 4) Advancing Engg. Mathematics by E.K.Kreyzig.
- 5) A Text Book of Applied Mathematics by P.N. Wartikar and J.N. Wartikar.
- 6) Higher Engg. Mathematics by B.S. Grewal.
- 7) Control System by Gopal and Nagrath.
- 8) Integral Transforms by Goyal & Gupta.

### 3SRN2 PROGRAMMING METHODOLOGY

#### SECTION-A (8 Hrs./Unit)

Unit I: Introduction to Computer and Languages, OOPS and Software development: Software Engineering and SDLC. Java Basics: Program Components, Compilation cycle. Introduction to Applet and Application, Data types and Variables

Unit II: Operators: Arithmetic operators, relational operators, Assignment operators. 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 method.

Unit III: Introducing classes, class fundamentals, declaring objects, methods, class data, & instance data, constructor, this keyword, access control, Introduction to String and String Buffer classes

#### SECTION-B

Unit IV: Applet class and its methods, Introduction to AWT, AWT classes: Button, TextField, Label. Working with Graphics, Working with colors, AWT controls, Fundamentals: Adding and removing controls, responding to control.

Unit V: Event handling: Event handling mechanism, Delegation Event model, Event, EventListener: ActionListener, mouseListener, mouseMotionListener, windowListener, Using delegation Event model: Handling mouse events, Adapter classes, Inheritance, Polymorphism, Abstract classes and Interface, Packages

Unit VI: Java File I/O: File, FileDialog 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 stream, Data Output stream, PrintWriter, Exception handling: Exception types, uncaught Exceptions using try and catch, throw, throws, finally. GUI objects programming: Frame class, menus and other GUI objects.

#### TEXT BOOKS:

- 1) Herbert Schildt : Java Complete References (McGraw Hill)
- 2) C. Thomas Wu: An Introduction to OOP with Java (McGraw Hill)

#### REFERENCES

- 1) Liag: Java Programming (PHI)

#### LIST OF PROGRAMS

The sample list of program is given below. This list can be used as guide line 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.

- | Sr No | Name of Program   |
|-------|---|
| 1     | Write a Java application to print a given format<br><pre style="margin-left: 40px;">* * * * * * * * * *</pre>   |
| 2     | Design an Applet to Draw a String inside a Pentagon with specified font and color   |
| 3     | Write an Java application for Loan Calculator   |
| 4     | Write an Applet that accepts the user name via Text Field object. When user presses the Enter Key the Applet displays a "Welcome <user name>" with <user name> replaced with actual name entered by user. |
| 5     | Write an Applet that displays a BMI of a person given his or her weight in Kilogram and height in Meters  |
| 6     | Write an Application program in Java using Switch statement to print A-Z, a-z, 0-9 by inputting ASCII value of first character  |
| 7     | Write an application in Java which reads a string from user as a command line argument and checks the string for vowels, and when the vowel encounters it append the word "egg" before each vowel         |
| 8     | Write an application in Java to design "Simple Calculator"  |
| 9     | Write an application in Java which creates an AddressBook class which manages collection of Person object and allows programmer to add, delete, search a Person object in the Address Book                |
| 10    | Write an application in Java which reads and writes User defined  |

- Byte Array from and to a file using Low Level File I/O
- 11 Write an application in Java which creates a File menu on Frame with menuItem "DialogBox".  
When user clicks on menuItem one Dialog Box will appear on the Frame with one TextField and two Buttons "OK" and "CANCEL". After entering the data in the TextField and clicking the OK Button Dialog Box closes and data will appear on a Frame Window and when presses CANCEL Button Dialog Box closes and control comes back on Frame Window
- 12 Write an application in Java which return current x,y coordinates when any mouse button is Pressed and draws freehand drawing when mouse is Dragged .

### 3SRN3 DISCRETE STRUCTURE

#### SECTION 'A' (8 Hrs./Unit)

- UNIT I :- Mathematical Logic :  
Statements & Notation, Connectives, Normal forms, The theory of inference for the statement calculus : Validity using truth tables, predicate calculus.
- UNIT II :- Set Theory :  
Basic concepts, Relation and ordering, Functions, Recursive function. Sets & Predicates.
- UNIT III :- Algebraic Structures :  
Semigroups and Monoids, Product & Quotients of semigroups, Grammars & Languages, Polish expression & their compilation, Groups, Product and Quotients of Groups.

#### SECTION 'B'

- UNIT IV :- Lattice & Boolean Algebra:-  
Lattices, Partially ordered sets, Boolean Algebra, Functions on Boolean Algebras, Boolean Functions as Boolean Polynomials, Minimization of Boolean Functions.
- UNIT V :- Graph Theory :  
Basic concepts, Paths, reachability & connectedness, Matrix representation of graphs, Trees: tree searching, Undirected trees, Minimal spanning trees.
- UNIT VI :- Computability theory:-  
Finite state machines, Finite state acceptors and regular grammars. Turing, machines and partial recursive functions.

### TEXT BOOK :-

1. J.P.Trembley, R. Manohar : "Discrete Mathematical Structures with application to Computer Science" 1988 (MCG)

### REFERENCE BOOKS:-

1. C.L.Lill : "Combinational Mathematics" Mc Graw Hill, 1988
2. Stanant "Discrete Structure" Prentice Hall.
3. C.L.Lill "Element of Discrete Mathematics" Second Edition McGraw Hill, 1987
4. Bernard Kolman, Robert C. Busby, Sharon Ross: "Discrete Mathematical Structures" Third Edition PHI

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### 3 SRN4 ELECTRONIC DEVICES & CIRCUITS

#### SECTION-A

- UNIT I : Diodes : Characteristics of semiconductor diodes, diode resistance. Rectifying circuits & dc power supplies, HWR, FWR, BR, comparison. Filter circuits for power supplies: Inductor, Capacitor, LC, IT Filters.
- UNIT II : 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 characteristics, CB amplifier, CC amplifier.
- UNIT III : The CE amplifier Graphical analysis, Input & output resistance, Input wave form consideration, Comparison of amplifiers. Transistor biasing : Stability Factor, CB bias, Emitter bias, Bias compensation.

#### SECTION-B

- UNIT IV : Oscillators : Effect of positive feedback. phase-shift oscillator, Wein-Bridge oscillator, RC Oscillator, Transistor as a switch, switching time in transistors, Multivibrators.
- UNIT V : FET amplifiers: Advantages & disadvantages of FET. Principle of operation, characteristics, Common source AC amplifier. Fixed Bias. Source follower, Frequency Response. Introduction to MOSFETS.
- UNIT VI : Opto Electronic Devices : Fundamentals of light, photoconductive sensors, photodiodes, phototransistors, their principle of operation & applications. photovoltaic

sensors, photoemissive sensors, Light emitters, Alphanumeric displays, photocouplers.

**Text Book :**

1. Malvino : Principles of Electronics (TMH)
2. Millman & Halkins : Electronic Devices & Circuits (Mc Graw Hill)
3. Millman & Halkins: Integrated Electronics (Mc Graw Hill)
4. David A Bell "Electronic Devices & Circuits" (5/e) (Oxford University Press).

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**3SN5 COMMUNICATION ENGINEERING-I**

**SECTION - A**

Unit I : Signal and Noise : - Audio signals, frequency range speech and music, sound intensity, loudness, level, frequency response, bandwidth, bandwidth requirement for different types of signals such as telegraph, telephone speech, music and video Noise: External and internal noise, noise figure, signal to noise ratio, noise figure measurement.

Unit II: Modulation Techniques : - 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.

Unit III: 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.

**SECTION - B**

Unit IV: AM Receivers : - TRF receiver, superhetrodyne receiver, details of each block such as RF 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.

Unit V : 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.

Unit VI : 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.

**PRACTICALS :-** Minimum 8 practicals based on above syllabus, preferably uniformly distributed.

**TEXT BOOK :-**

1. Kennedy G.: Electronics Communication System, Tata McGraw Hill Co. New Delhi.

**REFERENCE BOOKS :-**

1. Young P.H.: Electronics Communication Techniques, Columbus, A Bell and Howell Co.
2. Martin James. : Telecommunication and the Computer, Prentice Hall Inc. New Jersey.
3. Roddey D. Coolen S.: Electronics Communication, Prentice Hall India Pvt. Ltd.
4. Beck, Robert and J.Schoen: Electronics Communication, Modulation and Transmission, A Bell and Howell Co. Indiana.

**3SN6 Computer Laboratory II:-**

This Lab is based on Unix/Linux Operating System.

The topics to be covered include:

- 1) Unix commands.
- 2) General Purpose Utilities & Editors
- 3) The Shell & Shell Programming
- 4) Communication & Electronic Mail
- 5) TCP/IP Networking
- 6) Internet with Linux/Unix.

**Textbook :**

S.Das Unix : Concepts & Applications (TMH).

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**FOURTH SEMESTER****4 SRN 1****DATASTRUCTURES****SECTION-A**

(8 hrs/unit)

- Unit I: Data structures basics, Mathematical /algorithmic notations & functions, Complexity of algorithms, Subalgorithms. String processing: storing strings, character data type, string operations, word processing, and pattern matching algorithms.
- Unit-II : Linear arrays and their representation in memory, traversing linear arrays, inserting & deleting operations, Bubble sort, Linear search and Binary search algorithms. Multidimensional arrays, Pointer arrays. Record structures and their memory representation. Matrices and sparse matrices.
- Unit-III : Linked lists and their representation in memory, traversing a linked list, searching a linked list. Memory allocation & garbage collection. Insertion deletion operations on linked lists. Header linked lists, Two- way linked lists.
- Unit-IV : Stacks and their array representation. Arithmetic expressions: Polish notation. Quick sort, an application of stacks, Recursion. Tower of Hanoi problem. Implementation of recursive procedures by stacks, Queues. Deques. Priority queues.
- Unit-V : Trees, Binary trees & and their representation in memory, Traversing binary trees. Traversal algorithms using stacks, Header nodes : threads. Binary search trees, searching, inserting and deleting in binary trees. Heap and heapsort. Path length & Huffman's algorithm. General trees.
- Unit-VI: Graph theory, sequential representations of graphs, Warshalls' algorithm, Linked representation, operations & traversing the graphs. Posets & Topological sorting. Insertion Sort, Selection Sort. Merging & Merge-sort, Radix sort, Hashing.

**Textbook :**

Seymour Lipschutz : " Theory & Problems of Data Structures"  
Schaum's Outline series (Mc Graw-Hill) International Editions.

**REFERENCES:**

1. Ellis Horowitz, Sartaj Sahni – Fundamentals of Data Structures (CBS Publications)

2. Trembley, Sorenson:- An Introduction to Data Structures with Applications.
3. Aho Ullman : Analysis and Design of Algorithms.
4. Standish: Data Structures in Java
5. Bhagat Singh, Naps : Introduction to Data Structures.

**4SRN1****DATASTRUCTURES-LABORATORY**

The sample list of program is given below. This list can be used as guide line 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. Write an application to implement Tower of Hanoi Problem Algorithm.
2. Write an application to implement Abstract data type stack
3. Write an program to evaluate Post fix expression using stack
4. Write a program to implement Abstract data type queue.
5. Write a program to implement singly linked list that performs various operation such as insertion, deletion, searching a node in linear linked list.
6. Write a program to implement Preorder Traversal of a binary tree.
7. Write a Program to search a given element using Binary Search.
8. Write a Program to implement Selection Sort.
9. Write a Program to implement Merge Sort.
10. Write a Program to Perform insertion or search in a specified level of a stack implemented tree- structured symbol table.

**4 SRN 2****NUMERICAL&STATISTICALMETHODS****SECTION-A**

(8 hrs/unit)

- UNIT-I Problem solving & computers, Numerical methods for roots of equations, polynomial,transcendental,quadratic equations. Bisection, False Position, Newton-Raphson & Direct substitution methods.
- UNIT-II Solution of Simultaneous Equations: Gauss Elimination, Gauss Seidel, Gauss-Jordan Methods. Matrix methods & Inversion Interpolation : Linear & polynomial.
- UNIT-III Numerical differentiation by polynomial fit, Numerical integration by Trapezoidal Rule, Simpson Rule, Gaussian Quadrature.

**SECTION-B**

- UNIT-IV Sampling frequency distribution, measures of central tendency, dispersion moments. Discrete probability dis-

tributions. Probability, Various types of distributions.

UNIT-V Regression : Linear LS fit, Nonlinear fit. Polynomial function. Correlation : Coefficient, Properties of correlation coefficient. Multiple, Partial and Rank correlation.

UNIT-VI Test of significance: Introduction, The  $\chi^2$ -test. The t-test, the F-test .

**Text Book:**

1. V Rajaraman : Computer Oriented Numerical Methods (PHI)
2. J.N.Kapoor : Mathematical Statistics (MCG)

**References :**

1. Sastry: Numerical Computation Methods(PHI)
2. M.R. Spiegel: Statistics (McGraw Hill)

**4 SN 3 LINEARELECTRONIC CIRCUITS**

**SECTION-A**

Unit I : Introduction to SPICE :

Circuit element sources in SPICE/PSPICE, DC Circuit Analysis, Transient analysis, A.C. circuit analysis for R, L, C circuits Modelling analysis of Diode, BJT & FET circuits.

Unit II : Linear wave shaping using RC & RL circuits, analysis and calculations of RC low pass and high pass filters, analysis of clamping & clipping circuits using diodes and switching transistors. Simulation using PSPICE.

Unit III : Operational amplifier

Differential amplifier : transfer-characteristics, constant current source, level shifting, block diagram of op-amp, frequency response, frequency compensation methods, study of ICs uA741. Simulation of Op-amp using PSPICE.

**SECTION-B**

Unit IV : Linear & non-linear applications of Op-Amp : inverting & non-inverting amplifiers, Voltage follower (AC-DC), integrator, differentiator, Precision rectifier, voltage to current converter, sinusoidal RC oscillator. Clipping and clamping circuits, comparator, astable, monostable & bistable multivibrator.

Unit V : Timer : block diagram of IC 555, applications of timer 555 as astable, monostable and bistable multivibrators, delayed timer, sawtooth generator, FSK modulator, sample and hold circuits, basics of analog multiplexer.

Unit VI : Phase Lock Loops : operation of phase lock loop system, transfer characteristics, lock range and capture range, study of PLL IC-565 and its application as AM detector, FM detector and frequency translator. Voltage Regulator : three pin voltage regulators 78 \*\* & 79 \*\* & its applications.

**PRACTICALS :** Minimum 8 experiments based on above syllabus. At least 4 experiments must be conducted using PSPICE.

**BOOKS RECOMMENDED :-**

- 1) M.H.Rashid (PHI) : SPICE for circuits and electronics using PSPICE
- 2) Gayakwad R.A. : OP-Amps and Linear Integrated Circuits, (PHI)
- 3) Milliman J. and Grabel A. : Microelectronics.
- 4) Tobey J.E. and Grame J.E. : Operational Amplifier Design and Applications, International Student Edition, 1983.
- 5) Linear Application Handbook : National Semiconductor.
- 5) Application Node on IC : BEL India.
- 6) Herb Taub and Donald Schilling : Digital Integrated Circuits, McGraw Hill Pub.

**4SRULEIN4 SOCIAL SCIENCES & ENGINEERING ECONOMICS**

**SECTION - A**

Unit I : Study of Social Science : Importance to Engineer, salient features of Indian constitution. Fundamental Rights and Duties. Directive Principles of State Policy. (9)

Unit II : Indian Parliament : composition and powers.

President of India : Election and Powers.

Council of Ministers and Prime Minister (9)

Unit III : Impact of Science and Technology on culture and Civilization. Human Society : Community Groups, Social Control : Meaning, Types and Agencies. Marriage and Family : Functions, Types and problems.

**SECTION - B**

Unit IV : Nature and scope of Economics : Special significance of Economics to Engineers.

Production : Factors of production, Laws of return, Various Economic systems, Forms of Business Organisation. (9)

Unit V : Banking : Functions of Central and Commercial Banks.

Taxation : Principle of taxation, Direct and Indirect taxes.

Market : Forms, perfect and imperfect competition, pricing under perfect and imperfect competition, prices discrimination under monopoly. (9)

Unit VI : Economics of Development : Meaning, Characteristics of under development, obstacles to Economic growth and vicious circle of poverty.

Economic Planning : meaning, objective and salient features of current five years plan of India.

Planning horizons, life structuring the alternatives.

Economics of comparison of different alternative projects. (10)

#### Books Recommended :

1. Pylee M.V. : Constitutional Govt. in India, S.Chand and Co.
2. Joshi G.N. : The Constitution of India, Macmillan India Ltd.
3. Mahajan : The Constitution of India, S.Chand, New Delhi.
4. Maclaver and Page : Principle of Sociology.
5. Davis K. : Human Society
6. Dewett and Varma J.D. : Elementary Economic Theory, S.Chand and Co.
7. A.N.Agrawal : Indian Economy, Problem of Development and Planning (Wiley Eastern Ltd), New Delhi.
8. S.K.Mishra : Indian Economy, Its Development Experience. Himalaya Pub.House, Bombay.
9. Datt R.K. : Indian Economy, S.Chand and Comp. New Delhi P.M.Sundharam
10. Dhingra I.C. : Indian Economy
11. E.Kuper : Economics of W.R.Development, McGraw Hill Co.,
12. James L.E., R.R.Lee : Economics of W.R.Planning, McGraw Hill Co.

#### 4 SRN 5 ASSEMBLY LANGUAGE PROGRAMMING

##### SECTION-A (8 hrs/unit)

Unit I: 8086 architecture and pin configuration, Software model of 8086 microprocessor. Memory addresses space and data organization. Data types. Segment registers, memory segmentation. IP & Data registers, Pointer, Index registers. Memory addresses generation.

Unit II: 8086 Instruction set overview, addressing modes. 8086 instruction formats. 8086 programming: Integer instructions and computations: Data transfer instructions, Arithmetic instructions and their use in 8086 programming.

Unit III: 8086 programming: logical instructions. Shift and rotate instructions and their use in 8086 programming. 8086 flag register and Flag control instructions, compare instruction, control flow and jump instructions, Loops & loop handling instructions. 8086 programming using these instructions.

#### SECTION B

Unit IV: The 8086 stack segment and stack related instructions. 8086 I/O Address space. Subroutines and related instructions, Parameter passing, Concept of Macros, Status saving on stack. Concept of recursion at assembly program level. 8086 Programming using subroutines, recursion and macros.

Unit V: 8086 I/O: Types of input output, isolated I/O interface, input output data transfers, I/O instructions and bus cycles. Programmable Peripheral Interface 8255 PPI: pin diagram, internal organization, modes of operation. 8086 I/O programming using 8255.

Unit VI: 8086 Interrupts types, priority and instructions. Interrupt vector table, External hardware-interrupt interface signals & interrupts sequence. Software interrupts. Non-maskable interrupts. Programmable Interrupt Controller 8259: pin diagram, internal organization, modes of operation. 8086 Interrupt-driven programming using 8259.

#### TEXT BOOKS:

1. W. A. Triebel & Avatar Singh: The 8088/8086 Microprocessors (4e) (PHI /Pearson Education)
2. Liu & Gibson: The 8088/8086 Microprocessor (2/e) (PHI)

#### REFERENCES:

1. Barry B. Brey : The Intel Microprocessor Architecture, Programming & Interfacing (6/e)(PHI)
2. Ray & Bhurchandi: Advanced Microprocessors & Peripherals (TMH).
3. John P Uffenbeck, "8086/8088 Families: Designing, Programming and Interfacing". Prentice Hall .

**4SRN5 ASSEMBLY LANGUAGE PROGRAMMING-****LABORATORY**

The sample list of program is given below. This list can be used as guide line 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.

- Write a program in TASM to manipulate the two given operands with general arithmetic operators +, -, \*, / and store the result at the given location 2000H to 2003H respectively.
- Write an instruction sequence that generates a byte size integer in the memory location defined as RESULT. The value of the integer is to be calculated from logical equation  $[\text{RESULT}] = [\text{AL}] * [\text{NUM1}] + [\text{NUM2}] * \text{AL} + \text{BL}$
- Assume that all parameters are byte- sized. NUM1, NUM2 and RESULT are the offset addresses of the memory location in the current data segment.
- Given a number XY, write a program using TASM to store 0X in BX register and 0Y in CX register.
- Write a TASM program to sort the elements using Bubble Sort Algorithm.
- Write a program in TASM to search for a single item from a list of elements using Binary Search Algorithm. Show that if the element is found or not.
- Write a program in TASM to convert the given binary number into decimal number. The unsigned eight-bit value is stored in variable BINVAL; the three-digit ASCII result is stored in three memory locations HUN, TEN and ONE.
- Given 16-bit binary number in DX, write a program that converts it into its equivalent BCD number. If result is bigger than 16-bit, place all 1's in DX
- Write a program using TASM by using DOS INT 21H, function 09H to display string. The string to be displayed must have a '\$' as its last character. The string address of the string must be loaded into register DX and the string must reside within current data segment.
- Write a program using TASM to echo command line text to the screen using INT 21H, function 02H.
- Write a program using TASM to read the date maintained by the system and return the following information using DOS INT 21H, function 2AH.  
 DH = Month  
 DL = Day of month  
 CX=Year

AL=Day of the week

- Using DOS INT 21H function 08H write a program in TASM to obtain a secret Password from user. The password is not echoed to the screen. The password is stored in PWTXT and may be of any length, but must be terminated by a carriage return.
- Using DOS INT 21H, function 05H, write a program in TASM to output ASCII code contained within register DL to the printer.

**4 SN 6 COMPUTER LABORATORY**

This Lab is based on Web publishing. The topics to be covered include

- :
- 1) Web Publishing
  - 2) Web Page Design
  - 3) Exposure to IE & NN browsers
  - 4) Dynamic HTML

**Each group of 2 students should prepare their own Website.**

**Text book :**

M.Petrovsky:Dynamic HTML in Action(TM)

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APPENDIX-B  
 FOUR YEAR B.E. DEGREE COURSE  
 BRANCH : INFORMATION TECHNOLOGY  
 SEMESTER PATTERN  
**THIRD SEMESTER**

L : Theory Lecture  
 T : Tutorial  
 P : Practical  
 D : Drawing / Design

ABBREVATIONS :-  
 S - SEMESTER PATTERN  
 N - INFORMATION TECHNOLOGY  
 R - COMPUTER SCI. & ELECTRONICS  
 U - ELECTRONICS & TELECOMMUNICATIONS  
 L - INDUSTRIAL ELECTRONICS

| Sr. No.      | Sub. Code | SUBJECT                               | Teaching Scheme |   |     | Examination Scheme |                          |                          |                                  |       |                 |                     |                     |             |                   |
|--------------|-----------|---------------------------------------|-----------------|---|-----|--------------------|--------------------------|--------------------------|----------------------------------|-------|-----------------|---------------------|---------------------|-------------|-------------------|
|              |           |                                       | L               | T | P/D | Theory             |                          |                          |                                  |       | Practical       |                     |                     |             |                   |
| No.          | No.       |                                       |                 |   |     | Total Hours/Week   | Duration of Papers (Hrs) | Max. Marks Theory Papers | Maximum Marks College Assessment | Total | Min. Pass Marks | Max. Marks External | Max. Marks Internal | Total Marks | Minimum Pass Mark |
| 1.           | 3SRN1     | Mathematics-III                       | 5               | - | -   | 5                  | 3                        | 80                       | 20                               | 100   | 40              | —                   | —                   | —           | —                 |
| 2.           | 3SRN2     | Programming Methodology               | 4               | - | 2   | 6                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 3.           | 3SRN3     | Discrete Structures                   | 4               | 1 | -   | 5                  | 3                        | 80                       | 20                               | 100   | 40              | —                   | —                   | —           | —                 |
| 4.           | 3SRN4     | Electronic Devices & Circuits         | 4               | - | 2   | 6                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 5.           | 3SN5      | Communication Engg.-I                 | 4               | - | 2   | 6                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 6.           | 3SN6      | Computer Laboratory (Unix/Linux Lab.) | -               | 1 | 2   | 3                  | -                        | -                        | -                                | -     | -               | 25                  | 25                  | 50          | 25                |
| <b>TOTAL</b> |           |                                       | 21              | 2 | 8   | 31                 |                          |                          |                                  | 500   |                 |                     |                     | 200         |                   |

**Grand Total : 700**

**FOURTH SEMESTER**

| Sr. No.      | Sub. Code | SUBJECT                                   | Teaching Scheme |   |     | Examination Scheme |                          |                          |                                  |       |                 |                     |                     |             |                   |
|--------------|-----------|---|-----------------|---|-----|--------------------|--------------------------|--------------------------|----------------------------------|-------|-----------------|---------------------|---------------------|-------------|-------------------|
|              |           |   | L               | T | P/D | Theory             |                          |                          |                                  |       | Practical       |                     |                     |             |                   |
| No.          | No.       |   |                 |   |     | Total Hours/Week   | Duration of Papers (Hrs) | Max. Marks Theory Papers | Maximum Marks College Assessment | Total | Min. Pass Marks | Max. Marks External | Max. Marks Internal | Total Marks | Minimum Pass Mark |
| 1.           | 4SRN1     | Data Structures                           | 4               | - | 2   | 6                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 2.           | 4SRN2     | Numerical & Statistical Methods           | 4               | - | -   | 4                  | 3                        | 80                       | 20                               | 100   | 40              | —                   | —                   | —           | —                 |
| 3.           | 4SN3      | Linear Electronic Circuits                | 4               | 1 | 2   | 7                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 4.           | 4SRULEIN4 | Social Sciences and Engineering Economics | 4               | - | -   | 4                  | 3                        | 80                       | 20                               | 100   | 40              | —                   | —                   | —           | —                 |
| 5.           | 4SRN5     | Assembly Language Programming             | 4               | - | 2   | 6                  | 3                        | 80                       | 20                               | 100   | 40              | 25                  | 25                  | 50          | 25                |
| 6.           | 4SN6      | Computer Laboratory                       | -               | 1 | 2   | 3                  | -                        | -                        | -                                | -     | -               | 25                  | 25                  | 50          | 25                |
| <b>TOTAL</b> |           |   | 20              | 2 | 8   | 30                 |                          |                          |                                  | 500   |                 |                     |                     | 200         |                   |

**Grand Total : 700**

## APPENDIX-C

FOUR YEAR B.E. DEGREE COURSE

BRANCH : INFORMATION TECHNOLOGY

SEMESTER PATTERN

FIFTH SEMESTER

ABBREVIATIONS :-

S - SEMESTER PATTERN

N - INFORMATION TECH.

R - COMP. SC. &amp; ENGG.

L : Theory Lecture

T : Tutorial

P : Practical

D : Drawing / Design

| Sr. No.      | Sub. Code | SUBJECT                              | Teaching Scheme |          |          |           | Examination Scheme |                          |                             |                                   |       |                 |            |                               |          |                    |
|--------------|-----------|--------------------------------------|-----------------|----------|----------|-----------|--------------------|--------------------------|-----------------------------|-----------------------------------|-------|-----------------|------------|-------------------------------|----------|--------------------|
|              |           |                                      | L               | T        | P/D      | Total     | Theory             | Practical                | Theory                      |                                   |       | Practical       |            | Minimum                       |          |                    |
|              |           |                                      |                 |          |          |           | Hours/Week         | Duration of Papers (Hrs) | Max. Marks of Theory Papers | Maximum Marks College Assessment. | Total | Min. Pass Marks | Max. Marks | Max. Mark College Assessment. | To- Pass | Minimum Pass Marks |
| 1.           | 5SRN1     | Principles of Management             | 4               | -        | -        | 4         | 3                  | 80                       | 20                          | 100                               | 40    | —               | —          | —                             | —        | —                  |
| 2.           | 5SN2      | Digital Integrated Circuits          | 4               | -        | 2        | 6         | 3                  | 80                       | 20                          | 100                               | 40    | 25              | 25         | 50                            | 25       |                    |
| 3.           | 5SN 3     | Computer Architecture & Organisation | 4               | -        | -        | 4         | 3                  | 80                       | 20                          | 100                               | 40    | —               | —          | —                             | —        |                    |
| 4.           | 5SN 4     | Communication Engineering-II         | 4               | -        | 2        | 6         | 3                  | 80                       | 20                          | 100                               | 40    | 25              | 25         | 50                            | 25       |                    |
| 5.           | 5SN5      | Object Oriented Technologies         | 4               | 1        | 2        | 7         | 3                  | 80                       | 20                          | 100                               | 40    | 25              | 25         | 50                            | 25       |                    |
| 6.           | 5SRN 6    | Communication Skills                 | 2               | 1        | -        | 3         | 2                  | 40                       | 10                          | 50                                | 20    | —               | —          | —                             | —        |                    |
| <b>TOTAL</b> |           |                                      | <b>22</b>       | <b>2</b> | <b>6</b> | <b>30</b> |                    |                          |                             | <b>550</b>                        |       |                 |            | <b>150</b>                    |          |                    |

**GRAND TOTAL : 700****SIXTH SEMESTER**

|              |       |                                    |           |          |          |           |   |    |    |            |    |    |    |            |    |
|--------------|-------|------------------------------------|-----------|----------|----------|-----------|---|----|----|------------|----|----|----|------------|----|
| 1.           | 6SN 1 | Operating Systems                  | 4         | -        | 2        | 6         | 3 | 80 | 20 | 100        | 40 | 25 | 25 | 50         | 25 |
| 2.           | 6SN 2 | Digital Communication              | 4         | -        | -        | 4         | 3 | 80 | 20 | 100        | 40 | —  | —  | —          | —  |
| 3.           | 6SN 3 | Data Base Management Systems       | 4         | -        | 2        | 6         | 3 | 80 | 20 | 100        | 40 | 25 | 25 | 50         | 25 |
| 4.           | 6SRN4 | Theory of Computation              | 5         | -        | -        | 5         | 3 | 80 | 20 | 100        | 40 | —  | —  | —          | —  |
| 5.           | 6SN 5 | Microprocessor Based Design        | 5         | -        | 2        | 7         | 3 | 80 | 20 | 100        | 40 | 25 | 25 | 50         | 25 |
| 6.           | 6SN 6 | Computer Laboratory<br>(VC++ Lab.) | -         | 1        | 2        | 3         | - | —  | —  | —          | —  | 25 | 25 | 50         | 25 |
| <b>TOTAL</b> |       |                                    | <b>22</b> | <b>1</b> | <b>8</b> | <b>31</b> |   |    |    | <b>500</b> |    |    |    | <b>200</b> |    |

**GRAND TOTAL : 700**

## APPENDIX-D

L : Theory Lecture

T : Tutorial

P : Practical

D : Drawing / Design

FOUR YEAR B.E. DEGREE COURSE  
BRANCH : INFORMATION TECHNOLOGY  
SEMESTER PATTERN  
SEVENTH SEMESTER

ABBREVIATIONS :-

S - SEMESTER PATTERN

N - INFORMATION TECH.

R - COMP. SC. &amp; ENGG.

| Sr. No. | Sub. Code | SUBJECT                                 | Teaching Scheme |   |     |       | Examination Scheme |                          |                                    |                                      |       |                 |            |                             |                    |
|---------|-----------|---|-----------------|---|-----|-------|--------------------|--------------------------|------------------------------------|--------------------------------------|-------|-----------------|------------|-----------------------------|--------------------|
|         |           |   | L               | T | P/D | Total | Hours/Week         | Duration of Papers (Hrs) | Theory Max. Marks of Theory Papers | Maximum Marks of College Assessment. | Total | Min. Pass Marks | Max. Marks | To-Mark College Assessment. | Minimum Pass Marks |
| 1.      | 7SN1      | Fiber Optic and Satellite Communication | 4               | - | -   | 4     | 3                  | 80                       | 20                                 | 100                                  | 40    | —               | —          | —                           | —                  |
| 2.      | 7SN2      | Software Project Management             | 4               | 1 | 2   | 7     | 3                  | 80                       | 20                                 | 100                                  | 40    | 25              | 25         | 50                          | 25                 |
| 3.      | 7SN 3     | Computer Network & Programming          | 4               | - | 2   | 6     | 3                  | 80                       | 20                                 | 100                                  | 40    | 25              | 25         | 50                          | 25                 |
| 4.      | 7SN 4     | Real Time and Embedded System           | 5               | - | 2   | 7     | 3                  | 80                       | 20                                 | 100                                  | 40    | 25              | 25         | 50                          | 25                 |
| 5.      | 7SN5      | Elective-I*                             | 4               | - | -   | 4     | 3                  | 80                       | 20                                 | 100                                  | 40    | —               | —          | —                           | —                  |
| 6.      | 7SN 6     | Project and Seminar                     | -               | - | 2   | 2     | -                  | --                       | --                                 | --                                   | --    | —               | —          | —                           | —                  |
| TOTAL   |           |   | 21              | 1 | 8   | 30    |                    |                          |                                    | 500                                  |       |                 |            | 150                         |                    |

GRAND TOTAL : 650

\*Elective-I : 1) Modelling and Simulation      2) Distributed Operating System      3) Management Information System      4) Data Warehousing & Mining

## EIGHTH SEMESTER

|       |        |                                     |    |   |    |    |   |    |    |     |    |    |    |      |    |
|-------|--------|-------------------------------------|----|---|----|----|---|----|----|-----|----|----|----|------|----|
| 1.    | 8SRN 1 | Digital Signal Processing           | 4  | - | 2  | 6  | 3 | 80 | 20 | 100 | 40 | 25 | 25 | 50   | 25 |
| 2.    | 8SN 2  | Network Administration and Security | 4  | 1 | 2  | 7  | 3 | 80 | 20 | 100 | 40 | 25 | 25 | 50   | 25 |
| 3.    | 8SN 3  | Elective-II*                        | 4  | - | -  | 4  | 3 | 80 | 20 | 100 | 40 | —  | —  | —    | —  |
| 4.    | 8SRN4  | Internet Technologies               | 5  | - | 2  | 7  | 3 | 80 | 20 | 100 | 40 | 25 | 25 | 50   | 25 |
| 5.    | 8SN 5  | Project and Seminar                 | -  | - | 6  | 6  | - | -- | -- | --- | -- | 75 | 75 | 150* | 75 |
| TOTAL |        |                                     | 17 | 1 | 12 | 30 |   |    |    | 400 |    |    |    | 300  |    |

GRAND TOTAL : 700

\* Elective-II 1) E-Commerce

2) Computer Graphics

3) Distributed Data Base Management System

\*Note : Out of 75 marks - 50 marks for Project and 25 marks for Seminar.

Total Marks : 100

## PART-A

## SHORT ANSWER PATTERN

25 Marks

**1. The Multidisciplinary nature of environmental studies**

- . Definition, scope and importance.
- . Need for public awareness.

(2 lecture hours)

**2. Social Issues and the Environment**

- . From Unsustainable to Sustainable development
- . Urban problems related to energy
- . Water conservation, rain water harvesting, watershed management
- . Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- . Environmental ethics : Issues and possible solutions.
- . Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- . Wasteland reclamation.
- . Consumerism and waste products.
- . Environment Protection Act.
- . Air (Prevention and Control of Pollution) Act.
- . Water (Prevention and Control of Pollution) Act.
- . Wildlife Protection Act.
- . Forest Conservation Act.
- . Issues involved in enforcement of environmental legislation.
- . Public awareness.

(7 lecture hours)

**3. Human Population and the Environment**

- . Population growth, variation among nations.
- . Population explosion - Family Welfare Programme.
- . Environment and human health.
- . Human Rights.
- . Value Education.
- . HIV / AIDS.
- . Women and Child Welfare.
- . Role of Information Technology in Environment and human health.
- . Case Studies.

(6 lecture hours)

**4. Natural resources :****Renewable and non-renewable resources :**

- . Natural resources and associated problems.
  - Forest resources : Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
  - Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
  - Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
  - Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.
  - Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.
  - Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- . Role of an individual in conservation of natural resources.
- . Equitable use of resources for sustainable lifestyles.

(8 lecture hours)

**5. Ecosystems**

- . Concept of an ecosystem.
- . Structure and function of an ecosystem.
- . Producers, consumers and decomposers.
- . Energy flow in the ecosystem.
- . Ecological succession.
- . Food chains, food webs and ecological pyramids.
- . Introduction, types, characteristic features, structure and function of the following ecosystem :-
  - Forest ecosystem
  - Grassland ecosystem
  - Desert ecosystem
  - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lecture hours)

**6. Biodiversity and its conservation**

- . Introduction - Definition : genetic, species and ecosystem diversity.
- . Biogeographical classification of India.
- . Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
- . Biodiversity at global, National and local levels.
- . India as a mega-diversity nation.
- . Hot-spots of biodiversity.

- . Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- . Endangered and endemic species of India.
  - . Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. (8 lecture hours)

### 7. Environmental Pollution

- . Definition
  - . Causes, effects and control measures of :-
    - Air pollution
    - Water pollution
    - Soil pollution
    - Marine pollution
    - Noise pollution
    - Thermal pollution
    - Nuclear hazards
- . Solid Waste Management : Causes, effects and control measures of
  - . Role of an individual in prevention of pollution.
  - . Pollution case studies.
  - . Disaster management : floods, earthquake, cyclone and landslides. (8 lecture hours)

### PART-C ESSAY ON FIELD WORK 25 Marks

#### 8. Field work

- . Visit to a local area to document environmental assets - river / forest / grass land / hill / mountain
- . Visit to a local polluted site - Urban / Rural / Industrial / Agricultural
- . Study of common plants, insects, birds.
- . Study of simple ecosystems - pond, river, hill slopes, etc. (5 lecture hours)

- (Notes :**
- i) Contents of the syllabys mentioned under paras 1 to 8 shall be for teaching for the examination based on Annual Pattern.
  - ii) Contents of the syllabys mentioned under paras 1 to 4 shall be for teaching to the Semester commencing first, and
  - iii) Contents of the syllabys mentioned under paras 5 to 8 shall be for teaching to the Semester commencing later.

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**Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005**

Whereas it is expedient to frame an Ordinance relating to Examination in Environmental Studies leading to Bachelor Degree level, hereinafter appearing, the Management Council is hereby pleased to make the following Ordinance.

1. This Ordinance may be called "Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005."
2. This Ordinance shall come into force from the Academic session 2005-06.
3. In this Ordinance and in other ordinances relating to the examination, unless there is anything repugnant in the subject or context :-
  - (i) "Academic session" means a session commencing on such date and ending with such date of the year following as may be appointed by the Management Council.
  - (ii) "Admission to an examination" means the issuance of an admission card to a candidate in token of his having complied with all the conditions laid down in the relevant ordinance, by a competent officer of the University.
  - (iii) "Applicant" means a person who has submitted an application to the University in the form prescribed for admission to an examination.
  - (iv) "Candidate" means a person who has been admitted to an examination by the University.
  - (v) "Regular Candidate" means an applicant who has applied for admission to a University examination through an affiliated college, Department or Institute in which he/she has prosecuting a regular course of study.
  - (vi) "Examinee" means a person who present himself/herself for an examination to which he/she has been admitted.
  - (vii) "Examination" means an examination prescribed by the University under the relevant Ordinance.
  - (viii) "External Candidate" means a candidate who is allowed to take a University examination in accordance with the provision of Original Ordinance No. 151.
  - (ix) " Non-Collegiate Candidate" means a candidate who is not a collegiate candidate.

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\* As amended vide Ordinance Nos. 7 of 2006 & 10 of 2007.

- (x) An "Ex-student" is a person who having once been admitted to an examination of this University, is again required to take the same examination by reason of his failure or absence thereat and shall include a student who may have joined a college, Department or Institute again in the same class.
  - (xi) "Bachelor Degree Examination" means an examination leading to Bachelor Degree of the University.
  - (xii) "Previous Year" means a year following by final year of Bachelor Degree.
4. Save as otherwise specifically provided, the conditions prescribed for admission to the examination under this Ordinance shall apply to all persons who wish to take the examination to the Degrees of the University mentioned in para 5 below.
  5. The conditions prescribed for admission to examination under this Ordinance shall apply to following degrees of the University :-
    - 1) Bachelor of Arts
    - 2) Bachelor of Performing Arts
    - 3) Bachelor of Fine Arts
    - 4) Bachelor of Mass Communication
    - 5) Bachelor of Social Work
    - 6) Bachelor of Commerce
    - 7) Bachelor of Business Administration
    - 8) Bachelor of Science
    - 9) Bachelor of Computer Science
    - 10) Bachelor of Computer Applications
    - 11) Bachelor of Pharmacy
    - 12) Bachelor of Science (Home Science)
    - 13) Bachelor of Technology (Cosmetics)
    - 14) Bachelor of Engineering
    - 15) Bachelor of Engineering (Part Time) (Civil)
    - 16) Bachelor of Textile
    - 17) Bachelor of Technology (Chemical Technology)
    - 18) Bachelor of Technology (Chemical Engg.)
    - 19) Bachelor of Architecture, and
    - 20) Bachelor of Laws (Five Year Course)
  6. i) Environmental Studies shall be a compulsory subject for a previous year examination of the following Bachelor Degrees of the University,
    - 1) Bachelor of Arts
    - 2) Bachelor of Performing Arts
    - 3) Bachelor of Fine Arts
    - 4) Bachelor of Mass Communication

- 5) Bachelor of Social Work
  - 6) Bachelor of Commerce
  - 7) Bachelor of Business Administration
  - 8) Bachelor of Science
  - 9) Bachelor of Computer Science
  - 10) Bachelor of Computer Applications
  - 11) Bachelor of Pharmacy
  - 12) Bachelor of Science (Home Science)
  - 13) Bachelor of Technology (Cosmetics)
  - 14) Bachelor of Engineering (Part Time) (Civil)
- ii) Environmental Studies shall be a compulsory subject for IIIrd & IVth Semester of the following Bachelor Degrees of the University,
- 1) Bachelor of Engineering
  - 2) Bachelor of Textile
  - 3) Bachelor of Technology (Chemical Technology)
  - 4) Bachelor of Technology (Chemical Engineering)
  - 5) Bachelor of Architecture, and
- iii) Environmental Studies shall be a compulsory subject for Vth & VIth Semester of the Degree of Bachelor of Laws (Five Year Course)
- iv) Students admitted to Second Year/Third Year/IVth Semester/ VIth Semester of various degree examination courses in different Faculties in the academic session 2005-06 or thereafter shall have to appear for examination in the subject Environmental Studies.
7. The main examination leading to Environmental Studies shall be held in Summer and supplementary examination in Winter every year, at such places and on such dates as may be appointed by Board of Examinations.  
**Explanation:-** Examination shall be conducted on the basis of one common question paper for all Bachelor Degree Examination courses irrespective of annual or semester pattern.
8. Scope of the subject for annual pattern examination and or semester pattern examination shall be as provided under the syllabus.
9. Common question paper for all courses covered under this Ordinance alongwith answer books shall be supplied by the University to the Colleges, Departments and Institutes for conducting the examination of the subject.
10. Valuation of the answer books relating to this subject shall be done at College/Department/Institution level only. Remuneration for valuation of answer books shall not be paid by the University.  
Provided that prescribed evaluation fee for evaluation of each answer

book/s of an external examinee/s appeared from the examination centre shall be paid to each examination centre.

11. It shall be obligatory on the part of the College/Department/Institute to submit candidate wise following information to the University on or before the date as may be prescribed by the University :-

| Sr. No. | Grade/Category | Marks secured  |
|---------|----------------|----------------|
| 1.      | “A”            | - 60 and above |
| 2.      | “B”            | - 45 to 59     |
| 3.      | “C”            | - 35 to 44     |
| 4.      | “D”            | - 25 to 34     |
| 5.      | “Fail”         | - 24 and below |
| 6.      | “Absent”       |                |

12. For the purposes of teaching, learning and examination, the Committee consisting of three teachers shall be appointed by the Principal/ Head of the Department/Head of the Institution under his/her Chairmanship/ Chairpersonship. While appointing three teachers on the said committee, the Principal shall take care that the teachers to be appointed on the committee, if necessary, shall be from different faculty.
13. i) Duration of theory examination of this subject shall be three hour.  
ii) For all Bachelor Degree examinations, common question paper of 100 marks shall be provided by the University.  
iii) Distribution of these 100 marks shall be as follows :-
- |   |   |          |
|---|---|----------|
| a) Part-A, Short Answer Pattern           | - | 25 Marks |
| b) Part-B, Essay type with inbuilt choice | - | 50 Marks |
| c) Part-C, Essay on Field Work            | - | 25 Marks |
14. Medium of instruction shall be English or Marathi or Hindi. Question paper shall be supplied in English and Marathi and Hindi. A candidate shall have option to write answers in English or Marathi or Hindi.
15. Examination for the subject Environmental Studies shall be compulsory for external candidates appearing as a fresh candidate at Winter and/or summer examination.
16. For teaching of the subject, there shall be atleast two hour per week. For teaching the subject to the regular candidates, a full time approved teacher of the University and or a person having Postgraduate Degree in any faculty with second class shall be considered eligible.

17. For teaching of the subject, additional fee to be charged to regular candidate shall be as prescribed by the University.
18. Every College/ University Teaching Department shall charge additional fee of Rs. 100/- to every Student of the subject Environmental studies. Out of this Rs. 100/-, the College/University Teaching Department shall have to pay Rs. 25/- to the University as an examination fee of each candidate for the subject environmental studies.
19. The Grade secured by an examinee in the examination of this subject shall not be considered for providing the facility of A.T.K.T. in next higher class.
20. The provisions of Ordinance No. 18/2001 shall not be applicable for securing a grade or higher grade in the examination of this subject.
21. Result of the Final Year of the respective Degree shall not be declared of an examinee unless he/she secures any one of the grade in the examination of subject.

Provided an examinee admitted to Five Year LL.B. course desiring not to continue his/her education beyond Sixth Semester of the said course shall have to secure any one of the grade in the examination of the subject otherwise his/her result of Sixth Semester for awarding B.A. degree shall not be declared.

22. Certificate shall be issued, to the successful examinees in the subject Environmental Studies, after the examination.

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## § REGULATION NO. 9 OF 2005

### **Examinations leading to the Degree of Bachelor of Engineering (Information Technology) (Four Year Degree Course.... Semester Pattern) Regulation, 2005**

Whereas it is expedient to frame the Regulation in respect of Examinations leading to the Degree of Bachelor of Engineering (Information Technology) (Four Year Degree Course.....Semester Pattern) for the purposes hereinafter appearing the Management Council is hereby pleased to make a following Regulation.

1. This regulation may be called “Examinations leading to the Degree of Bachelor of Engineering (Information Technology) (Four Year Degree Course....Semester Pattern) Regulation, 2005
2. This Regulation shall come into force w.e.f. the date of its approval by the Management Council.
3. The Schemes of Teachings and Examinations for Ist & IInd, IIIrd & IVth, Vth & VIth, and VIIth & VIIIth Semester in respect of Bachelor of Engineering (Information Technology) (Four Year Degree Course.... Semester Pattern) shall be as per Appendices A, B, C, and D appended with this Regulation respectively.

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§ As amended vide Regulation No. 23 of 2007.

**FIFTH SEMESTER****5SRN1 PRINCIPLES OF MANAGEMENT  
SECTION - A (8 hours/unit)**

UNIT I. Introduction : Definition and concepts of management ,Importance of management .Various management functions & control, responsibilities. Human resources planning , Decision-making, Trade unions & collective bargaining.

UNIT II. Organization planning, design and development: Production resources, Production planning, types of production system, production systems, production control.

UNIT III. Product design & development : Introduction, design of the product, New product development; Material planning and control. Inventory control technique .

**SECTION - B**

UNIT IV. Maintenance and system reliability: Concepts and Objectives of maintenance. Failure analysis, Reliability Maintenance system & Classification. Maintenance planning, TQM ISO 9000 and Quality audit.

UNIT V. Marketing management : Introduction, marketing planning . Consumer behavior, product management, Pricing & promotion decision. Financial planning. Source of finance.

UNIT VI. Project Management: Concepts and importance of project, Project implementation, MIS. MIS meaning and objectives. Types of data, methods of data collection, analysis and presentation of data. Editing, reporting and presentation of data, Decision options.

**Text book :**

A.K.Gupta, J.K. Sharma : Management of Systems (Macmillan)

**Referances :**

- 1.Appleby : Modern Business Administration, 6/e (Macmillan)
- 2.Tritaphy & Reddy: Principals of Management, 2/e (TMH)
- 3.Gupta, Sharma et : Principales of Practices of Management (Kalyani)

**5 SN 2 DIGITAL INTEGRATED CIRCUITS  
SECTION - A**

Unit-I : 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.

Unit-II: 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.

Unit-III: 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.

**SECTION - B**

Unit-IV: MSI & PLD components: introduction. Binary parallel adder, binary adder-subtractor, decimal adder, bcd adder, magnitude comparator, decoders & encoders. multiplexers. ROM. Various types of ROM. Programmable Logic Arrays. Programmable Array Logic.

Unit-V: 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.

Unit-VI: Design of Registers & shift registers. Random access memory (RAM). Memory decoding techniques. Hamming code. Algorithmic State Machines: introduction, ASM chart, timing considerations. Control implementation. Design with multiplexers. PLA control.

**Text-Book:**

1. M.Morris Mano "Digital Design" (2/e) (PHI).

**References:**

1. Taub & Schilling “ Digital Integrated Electronics” (TMH).
2. Jain R.P. “Modern Digital Electronics” (TMH).
3. Fletcher W.I.”An Engineering Approach to Digital Design” (PHI).
4. Shandige “ Digital System Design” (McGraw-Hill)

**5 SN 2 Digital Integrated Circuits Laboratory:** Minimum 12 experiments based on the above syllabus, two experiments on each unit. Chapter 11 "Laboratory Experiments" of the text- book :M.Morris Mano “Digital Design” (2/e) (PHI), may be referred for guidelines to setup laboratory sessions.

**5 SN 3 COMPUTER ARCHITECTURE & ORGANIZATION****SECTION - A**

Unit-I: Basic structure of computer: Hardware & software. Addressing methods. Program sequencing. concept of memory locations & address. Main memory operation. Instructions & instruction sequencing. Addressing modes. Basic I/O operations. Stacks. Queues & subroutines.

Unit-II: Processing Unit: fundamental concepts. execution of a complete instruction. hardwired control, performance consideration. Microprogrammed control; microinstructions, microprogram sequencing, microinstruction prefetching, emulation.

Unit-III: I/O organization: accessing I/O devices, interrupts, direct memory access: bus arbitration. I/O hardware: processor bus and interfacing circuits, standard I/O interfaces: SCSI bus, backplane bus standard.

**SECTION - B**

Unit-IV: Memory Unit: basic concepts, semiconductor RAM memories, internal organization, static & dynamic RAMs, ROMs. speed, size & cost considerations. Cache memories: performance considerations. Virtual memories, address translation, memory management requirements.

Unit-V: Arithmetic; number representation. design of fast adders, signed addition and subtraction. Multiplication of positive numbers, Booths' algorithm, Integer division. Floating-point numbers and related operations.

Unit-VI: Computer Peripherals: Input-output devices like video displays, video terminals, graphics input devices, printers. Online storage devices: magnetic disks, magnetic tape systems, CD-ROM systems. Communication devices: Modems.

**Text-Book:**

V. Carl Hamacher & S. Zaky “ Computer Organization” (4/e) McGraw-Hill (ISE).

**References:**

1. Stallings. W. “ Computer Organization & Architecture” (5/e) (Pearson Education).
2. Tenenbaum A.S.” Structured Computer Organization” (5/e) (Pearson Education).
3. Hayes J.P.” computer Architecture & Organization’ (4/e) (McGraw-Hill).
4. Mano M. & Kime “Logic & Computer Design Fundamentals” (2/e) (Pearson Education).

**5SN4 COMMUNICATION ENGINEERING – II****SECTION - A**

Unit I Analysis: Classification of signals, Fourier series, Exponential Fourier series, Fourier transform, properties of Fourier transform, Delta function, Fourier transform of periodic functions, Power spectral density, energy spectral density, correlation, Auto-correlation, cross-correlation.

Unit II Probability and Random Signal Theory: Probability, Random variable, PDF random processes, stationarity, Mean, Correlation and covariance functions, Ergodicity, spectral density, Gaussian process, White Gaussian noise.

Unit III Noise in CW Modulation: Mathematical representation of Noise, AM receivers, Signal – to – noise ratio, SNRs of SSB-SC, DSB-SC and DSB-FC systems, FM receivers, Noise in FM reception, FM threshold effect, comparison of AM and FM

**SECTION B**

Unit IV Pulse Modulation: The sampling theorem, sampling of Band-pass signal, Quantization and types of quantization, Practical aspects of sampling, Reconstruction of message process from its samples, time division, multiplexing, pulse amplitude modulation, pulse time modulation,

- Unit V Data Transmission: PCM, Differential PCM, DM, Basic principle of ASK, FSK, PSK, BPSK, DPSK, QPSK, BFSK, its generation, reception, error probability, band width requirement and comparison.
- Unit VI Switching Techniques: Introduction to switching system, Pulse dialing, touch tone dial telephone, space division switching, SPC, centralized and distributed SPC, time division switching: Basic time division space switching, time division time switching, time multiplexed space switching, time multiplexed time switching.

**PRACTICALS:** Minimum 8 practicals based on above syllabus, preferably uniformly distributed.

**REFERENCE BOOKS:**

1. Taub and Schilling D.L. : Principle of Communication Systems. Tata Mc Graw Hill
2. Simon Haykin: Communication System, John Wiley
3. T.Vishwanathan Telecommunication Switching Systems and Network, PHI
4. J.S.Chitode, Digital Communication:, Technical Publications, Pune
5. R.P.Singh, S.D.Sapre: Communication Systems, Analog and Digital.
6. Lathi B.P.: Modern Digital & Analog Communication System, A Prism Indian Edition

**5SN5 OBJECT ORIENTED TECHNOLOGIES**

**SECTION-A**

- UNIT I. Objects & Classes in C++ : Declaring & using classes, Constructors, Objects as functions arguments, Copy Constructor, Static class data. Arrays of objects, C++ String class.
- UNIT II. Operator overloading : Overloading unary & binary operators. Data conversion. Pitfalls of operator overloading. Pointers & arrays. Pointers & functions. new & delete operators. Pointers for objects.
- UNIT III. Inheritance in C++ : Derived class & base class, Derived class constructors, Function overloading, class hierarchies, Public and private inheritance, Multiple inheritance. Containership : classes within classes.

**SECTION-B**

- UNIT IV. Virtual functions concepts, Abstracts classes & pure virtual functions. Virtual base classes, Friend functions, Static functions, Assignment and copy initialization, the this pointer. Dynamic type information.
- UNIT V. Streams & Files in C++ : Stream classes, stream errors, disk file I/O with streams, File pointers, Error handling in file I/O. File I/O with members functions, overloading the extractions & insertion operators, Memory as a stream object, command-line arguments. Multifile programs.
- UNIT VI. Function Template, Class templates, Exception syntax, Multiple exceptions, exception with arguments. Introduction to the Standard Template Library. Algorithms, Sequential Containers, Iterates, Specialized iterates, Associative containers. Function objects.

**Text-Book :**

Robert Lafore Object-Oriented Programming in C++ (Galgotia)

**References :**

1. Bjarne Stroustrup C++ Programming Language (Addison-Wesley)
2. Herbert Schildt C++ : Complete Reference (TMH)
3. Venugopal Mastering C++ (TMH)
4. Lipmann C++ Primer (Addison-Wesley)

**5SN5 Laboratory :** Based on C++ Programming,

- (a) Six Programs covering each unit of syllabus.
- (b) One complete Project as suggested in chapter 16 of the textbook on Object - Oriented design.

**5 SRN 6 COMMUNICATION SKILLS**

Unit I : Comprehension over an unseen passage.

Comprehension - A - word study :-

Synonym, antonym, meanings, matching words, adjectives, adverbs, prefix and suffix, correct forms of commonly misspelled words, understanding of the given passage.

Comprehension - B - Structure study :-

Simple and compound sentences, types of conjunctions, singular and plural, tenses and their effect on verb forms. Use of - not only - but also, if clause, since, may, can, could, would, too etc.

Active and passive forms, negative and interrogative, punctuation and capitalization. (10 Hours)

Unit II : Theoretical background - importance of communication, its process, model of communication its components & barriers.

Verbal communication, its significance, types of written communication, organization of a text (Titles, summaries, headings, sequencing, signaling, cueing etc.), Important text factors (length of paragraph, sentences, words, clarification and text difficulty). Evaluation of written communication for its effectivity and subject content.

Non-verbal communication, types of graphics and pictorial devices. (10 Hours)

Unit III : Specific formats for written communication like - business correspondence, formal reports, technical proposals, research papers and articles, advertising and graphics. Format for day-to-day written communication like applications, notices, minutes, quotations, orders, enquiries etc.

Oral communications - Important objectives of interpersonal skills, (verbal and non-verbal), face to face communications, group discussion and personal interviews.

Methodology of conduction of meetings, seminars, symposia, conference and workshop. (10 Hours)

#### BOOKS RECOMMENDED :

- 1) Krishna Mohan, Meera Banerjee : Developing Communication Skills, MacMillan India Limited.
- 2) Chrissie Wright (Editor) : Handbook of Practical Communication Skills, Jaico Publishing House.
- 3) Curriculum Development Centre, TTTI WR, Bhopal : A Course in Technical English, Somaiya Publication Pvt. Ltd.
- 4) F.Frank Candlin : General English for Technical Students, University of London Press Ltd.

#### COMMUNICATION SKILLS LABORATORY

#### 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 news letter
6. Writing daily diaries and letters
7. Interactive language laboratory experiments.

**TEXT BOOK :** Norman Lewis : Word Power Made Easy

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

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#### SIXTH SEMESTER

#### 6 SN 1

#### OPERATING SYSTEMS

#### SECTION-A (8 Hrs./Unit)

UNIT-I Introduction: OS definition, Evolution of OS. Operating system structures: System components, OS services, system calls, System structure, Virtual Machines, System design, implementation & generation.

UNIT-II Process concepts, process state, PCB, scheduling and operations on processes, Co-operating processes. Threads, inter process communication. CPU Scheduling concepts. Scheduling criteria and algorithms and their evaluation. Multiple processor & Real time scheduling.

UNIT-III Process synchronization: Concept, classical problem of synchronization, critical section problem, and hardware. Semaphores, critical regions. Monitors. Deadlocks: Definition, conditions & characterization. Deadlock handling, prevention, avoidance, detection and recovery. Combined approach.

#### SECTION-B

UNIT-IV Memory management, swapping, single, multiple partition allocation, compaction, paging, implementation of page table, segmentation, paged segmentation, Virtual memory, demand paging, page replacement, page replacement policies, LRU algorithm, Thrashing concept & solution.

- UNIT-V The buffer cache, buffer headers, structure of buffer port, retrieval of buffer, buffer allocation, finding a buffer, releasing a buffer, reading and writing disk blocks, inode definition, structure of a regular file, sample file and its inode, inode assignment, allocation of disk blocks.
- UNIT VI I/O Hardware. Applications I/O interface. Kernel I/O subsystem. Disk scheduling & management, swap – space management. Case study: Linux system. Design principles. Process management, Memory management, File systems, I/O, Inter process communication, Network structure, Security in Linux.

**Text books:**

1. A. Silberschatz, P. B. Galvin : Operating System Concepts, Wiley Publication
2. Maurice J Bach : The Design of UNIX Operating System, PHI Publication.

**References:**

1. A. S. Tananbum : Operating Systems Pearson, Education
2. William Stallings : Operating Systems, Prentice Hall
3. Crowley : Operating Systems, TMH
4. M. Milankovic : Operating Systems, McGraw-Hill.

**OPERATING SYSTEMS : PRACTICALS****Part-A**

The lab. is based on above syllabus. The students should submit a project report, which contains the,

- 1) Implementation of a particular compiler or interpreter.  
OR
- 2) Build a “FORTRAN TO PASCAL”, “PASCAL TO C” kind conversion. The project must be make use of LEX & YACC tools.  
OR
- 3) LEX & YACC specifications for arithmetic expression.

**Part-B**

The students must write the programs on following topics :

- a) Semaphore & critical section.
- b) Interprocess communication using ‘send’ & ‘receive’
- c) Handling the redirection in a non standard way.
- d) Displaying the statistical information.

**6SN2 DIGITAL COMMUNICATION  
SECTION - A**

- Unit I : Digital Communication Systems: Information theory, modulation theory, detection & estimation theory, channel characterization and synchronization, elements of digital communication systems, multiplexing, signal format.
- Unit II: Discrete Communication Channel: capacity of discrete transmission over a discrete channel, capacity of discrete memory less channel, discrete channel with memory, source encoding, Quantiser-Uniform, nonuniform & differential.
- Unit III: Base Band Transmission: Base band & PAM systems, pulse shaping and inter symbol interference, Duobinary base band PAM system, equalization, transversal and automatic equalizers, scrambler and unscrambler, EYE diagram.

**SECTION - B**

- Unit IV: Error controlling and coding: examples of error control coding, Methods of controlling error, types of error, types of codes, linear block codes, matrix description of linear block codes, error detection and error correction capabilities of linear block codes, single error correcting Hamming codes, Binary cyclic codes, syndromes calculation, error detection.
- Unit V : Cellular Telephone Concepts: Introduction, mobile telephone service, cellular telephone architecture, frequency reuse, cell splitting, sectoring, segmentation and dualization, cellular system topology, roaming and handoffs, cellular network components.
- Unit VI: Spread Spectrum Signals: Model of spread spectrum communication system, direct sequence spread spectrum signals, generation of PN sequences, frequency hopping spread spectrum (slow frequency and high frequency hopping), comparison, basic principles of TDMA, FDMA, CDMA.

**REFERENCE BOOKS:**

1. K.S.Shanmugam: Digital & Analog Communication Systems, Wiley
2. J.G.Proakis: Digital Communication, Mc Graw Hill.
3. Wayne Tomasi : Advanced Electronics Communication Systems, Pearson.
4. Simon Haykin: Communication System, John Wiley
5. Lathi B.P.: Modern Analog & Digital Communication System., A Prism India Edition.

**6SN 3 DATABASE MANAGEMENT SYSTEMS****SECTION-A**

Unit-I: Database System Applications, Database Systems versus File Systems, View of Data, Data Models, Database Languages, Database Users and Administrators, Transaction Management, Database System Structure, Application architectures, History of Database Systems. Entity-Relationship Model, Basic Concepts, Constraints, Keys, Design Issues, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R Features, Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.

Unit-II: Relational Model: Structure of Relational Databases, The Relational Algebra, Extended Relational-Algebra Operations, Modification of the Database, Views, The Tuple Relational Calculus, The Domain Relational Calculus, SQL: Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Subqueries, Views.

Unit-III: Integrity and Security, Domain Constraints, Referential Integrity, Assertions, Triggers, Security and Authorization, Authorization in SQL, Encryption and Authentication, Relational-Database Design: First Normal Form, Pitfalls in Relational-Database Design, Functional Dependencies, Decomposition, BCNF, Third, Fourth and more Normal Forms, Overall Database Design Process.

**SECTION - B**

Unit-IV: Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions, Query Optimization: Overview, Estimating Statistics of Expression Results, Transformation of Relational Expressions, Choice of Evaluation Plans, Materialized Views.

Unit-V: Transaction Management : Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Execution, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.

Unit-VI: Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations Weak Levels of Consistency, Concurrency in Index Structures. Recovery System, issues & solutions.

**TEXT BOOK :** Korth, Sudarshan : Database System Concept , Mc Graw Hill, 4<sup>th</sup> Edition

**REFERENCES :**

1. Raghu Ramkrishnan : Database system
2. C.J.Date : Database System, 7<sup>th</sup> ed.
3. Connolly & Begg, : Database System, Low Price Ed.

**6SN 3 Database Management Systems Laboratory**

The sample list of programs based on ORACLE or MY SQL 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. Consider the employee database, where the primary keys are underlined & Write the Queries using following clauses & also retrieve the data from the given database.  
Employee (employee-name, street, city)  
Works (employee-name, company-name, salary)  
Company (company-name, city)  
Manages (employee-name, manager-name)  
I) Order By II) Between III) Group By IV) Having
2. Consider the above database & perform the different Join Operations which are as follows.  
I) Inner Join II) Left Outer Join III) Right Outer Join IV) Full Outer Join
3. Consider the above database & Perform the different Set Operations Which are as follows.  
I) Union II) Intersect III) Except/Minus
4. Consider the above database & perform the all Aggregate Functions.
5. Write an assertion for the bank database to ensure that the assets value for the 'perryridge' branch is equal to the sum of all amounts lent by the 'perryridge' branch.  
Customer (customer-name, customer-street, customer-city)  
Branch (branch-name, branch-city, asstes)  
Loan (loan-number, branch-name, amount)  
Borrower (customer-name, loan-number)  
Depositor (customer-name, account-number)  
Account (account-number, branch-name, balance)
6. Write an SQL trigger to carry out the following action: On delete of an account, for each owner of the account, check if the owner has any remaining accounts, and if she does not, delete her from the depositor relation.

7. Consider the above Bank database & write the SQL queries for the following views:
- I) A view containing the account numbers the customer names for all accounts at the deer park branch.
- II) A view containing the names and addresses of all customers who have an account with the bank, but do not have a loan.
8. Mini Project Using Oracle 9i & VB6

**6 SRN 4****THEORY OF COMPUTATION**

- Unit I : Alphabet, Language, Operations, Finite state machine, definitions, Finite automation model, Acceptance of strings and languages. Non deterministic finite automation, deterministic finite automata, equivalence between NFA and DFA. Conversion of NFA into DFA, minimisation of FSM, equivalence between two FSM's, Moore and Melay machines.
- Unit II : Regular sets, regular expressions, identity rules. Manipulation of regular expressions, equivalence between RE and FA. Inter conversion, pumping lemma, Closure properties of regular sets (proofs not required), Regular grammars, right linear and left linear grammars, equivalence between regular linear grammar and F A inter conversion between RE and RG.
- Unit III : Context free grammar, derivation trees, Chomsky normal form, Greibach normal form, push down automata, definition, model, acceptance of CFL, equivalence of CFL and PDA, interconversion, enumeration of properties of CFL (proofs omitted)
- Unit IV : Turing machine, definition, model, design of TM, computable functions, recursive enumerable language, Church's hypothesis, counter machine, types of TM's.
- Unit V : Chomsky hierarchy of languages, linear bounded automata and context sensitive language, introduction of DCFL and DPDA, LR (O), grammar, decidability of problems.
- Unit VI : Undecidability : properties of recursive & non-recursive enumerable languages, universal turing machine, post-correspondance problem, introduction to recursive function theory.

**Text Books :**

1. Introduction to Automata Theory, Languages and Computation by Hopcraft H.E. & Ullman J.
2. An Introduction to Formal Languages and Automata by Peter Linz (Chapter 1 to 12 except 6.3 & 7.4)

**Reference books :**

1. Introduction to Languages and the Theory of Automata by John C.Martin.
2. Elements of Theory of Computation by Lewis H.P. and Papadimitriou C.H.
3. Theory of Computation by Mishra & Chandrashekar.

**6 SN 5****MICROPROCESSOR BASED DESIGN****SECTION - A**

- Unit-I: 8086: Pin configuration, physical memory organization, general bus organization, I/O addressing, 8086 minimum mode system & timings, Memory interfacing, static RAM interfacing, dynamic RAM interfacing.
- Unit-II: I/O interfacing; methods of I/O interfacing, 8255 PPI: pin configuration, internal organization, modes of operation, interfacing with 8086. Programmable Interrupt Controller 8259 : pin configuration, various control & command words and internal organization, modes of operation, interfacing with 8086.
- Unit-III: USART 8251: pin configuration, internal organization, control word formats for synchronous & asynchronous modes of operation, 8251 interfacing with 8086. DMA controller 8237 : pin configuration, internal organization, modes of operation, 8237 interfacing with 8086.

**SECTION - B**

- Unit-IV: Programmable Timer/counter 8254: pin configuration, internal organization, all the modes of operation, and 8254 interfacing with 8086. Programmable Keyboard/display Controller 8279: pin configuration, internal organization, modes of operation, interfacing with 8086.
- Unit-V: ADC 0800/0809 : its working, interfacing with 8086 and programming in polled mode, in interrupt-driven mode. DAC 0800/0808 its working, interfacing with 8086 and programming in polled mode, in interrupt-driven mode. Measurement of temperature, speed and frequency using ADCs/DACs and 8086.

Unit-VI: 8086 maximum mode system & timings, bus controller 8288:its architecture, operation and interfacing with 8086. 8289 bus arbiter:its architecture, operation and interfacing with 8086.Coprocessor configuration.ESC prefix,system bus mode,semaphores & LOCK prefix.

**Text Book :**

Uffenbeck John. P. “8086/8088 Families:Design,Programming & Interfacing” (Prentice-Hall).

**References :**

1. Brey B. “ Intel Microprocessors” (PHI).
2. Triebel “ Intel Processors: Programming,Interfacing & Applications” (Prentice-Hall).
3. Liu & Gibson “ Microprocessors Systems: The 8086/8088 Family” (PHI).
4. Ray & Bhurchandi “ Advanced Microprocessors & Peripherals” (TMH).

**6 SN 5 Microprocessor Based Design Laboratory :**

Minimum 12 experiments based on the above syllabus, preferably two experiments on each unit.

**6 SN 6 Computer Laboratory (VC++ Lab.)**

Minimum eight programs based on the following text book :

J. Prosize : Programming Windows with MFC (Microsoft Press)

- i) MFC application creation
- ii) Using dialog boxes
- iii) Windows common controls
- iv) Document / View architecture
- v) Printing with MFC

**REFERENCES:-**

- 1) H. Schildt : MFC from Ground up (TMH)
- 2) Kruglinski : Inside Visual C++ 6 (Microsoft)
- 3) D.White : MFC Unleashed (Techmedia)

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**SEVENTH SEMESTER**

**7SNI FIBRE OPTIC AND SATELLITE COMMUNICATION**

**SECTION-A**

UNIT I: Optical Fibre Communication System : basic optical laws and definitions, Optical fibre modes and configurations, N.A. Attenuation : Units, absorption, scattering losses radioactive losses, core and cladding losses.

Material dispersion, wave guide dispersion, intermodal dispersion.

UNIT II : Optical Sources : Light Emitting Diodes : structure, light source materials.

Laser Diodes : structure, threshold conditions, modulations of Laser diodes.

Light source linearity, reliability considerations.

UNIT III : Optical Detectors : Physical principles of photodiodes, photo detector noise, detectors response time, avalanche multiplication noise, temperature effect on avalanche gain.

**SECTION - B**

UNIT IV : Elements of Satellite Communication : Satellite frequency bands, communication satellite systems, Kepler’s laws, Satellite orbits, LEO, MEO, GEO, HEO, LOOK angles & visibility, Orbital effect in communication system performance.

UNIT V : Satellite Link Design : basic transmission theory, EIRP, Antennas Gain patterns, Common antenna type, parabolic disc, atmospheric losses, system noise temperature & G/T ratio, UP link & Down link analysis, frequency reused.

UNIT VI : Satellite Transponder :

Transponder model, Satellite front end, R F filtering of digital carriers, introduction to satellite single processing, transponder limiting & non-linear satellite amplifiers.

**Text Books :**

1. G.Keiser : Optical Fibre Communication, McG Hill International Edition
2. Gagliardi Robert M : Satellite Communication, CBS Publications & Distributor’s, New Delhi.

**Reference Books :**

1. Seniors J.M. : Optical Fibre Communication and Applications, Prentice Hall of India Pvt. Ltd., New Delhi.

2. Pratt Timothy and Bostian W.Charles : Satellite Communication, Willey Int. Pub.,New York.
3. Denorise Roddy : Satellite Communication, MCG Hill Int, New York.

## 7SN 2 SOFTWARE PROJECT MANAGEMENT

- UNIT I. Evolving role of Software. Software crises & myths. Software engineering. Software process & process models : Linear sequential, prototyping, RAD, Evolutionary Product & Process. Project management concepts : People, Product, Process, Project. WSHH principle, critical practice.
- UNIT II. Measures, Metrics & Indicators. Metrics in process & project domains-software measurment, Metrics for software quality, small organization. Software projects Planning : Scope, resources, estimation, decomposition technique, Tools. Software risks : identification, risk projection,refinement & RMMM plan.
- UNIT III. Project Scheduling : Concepts. Peoples Efforts. Task set, Task network. Scheduling. EV analysis, Project Plan. Software quality concepts. SQ Assurance, Software reviews, technical reviews, software reliability, ISO 900 L, SQA Plan. SCM process. Version control. SCM standard.

### SECTION-B

- UNIT IV. System engineering : Hierarchy, Business Process & Product engineering : Overviews. Requirement engineering, System modeling. Requirement analysis. Analysis principles. Software prototyping. Specification. Design Process. Design Principles & Concepts. Effective modular design. Design model & documentation.
- UNIT V. Software architecture, Data Design, Architectural styles, Requirement mapping. Transform & Transaction mappings. User-interface design : Golden Rule. UTD, Task analysis & modeling, ID activities, Tools, design evaluation. Component level design : Structure programming, Comparison of design notation.
- UNIT VI. Software testing fundamentals ; test case design, Whitebox testing. Basis path, control structure-, Blackbox-Testing, & for specialized environments. Strategic approach to S/W testing. Unit testing, integration testing, validation testing, system testing. Debugging. Technical metrics for software.

## Textbook :

Pressman Roger. S. : Software Engineering, A Practitioner's Approach TMH.

## References :

1. Somerville : Software Engineering (Addison-Wesley) (5/e)
2. Fairly R. : Software Engineering (McGraw Hill)
3. Davis A. : Principles of Software Development (McGraw Hill)
4. Shooman, M.L. : Software Engineering (McGraw-Hill)

**7SN 2 SPM Laboratory ;** Based on above syllabus, at least one software development project involving all phases of SDLC. The case studies from the textbook and from reference book 3 may be considered as examples.

## 7SN3 COMPUTER NETWORK AND PROGRAMMING

### SECTION -A

- UNIT I. Introduction to network, history OSI model process, simple client server model, Unix networking, process daemon process and introduction to interprocess communication in Unix.
- UNIT II. Communication protocols TCP/IP, SNA, NetBIOS and protocol comparison, Berkley sockets, Elementary and Advanced socket system calls (Unix), socket implementation.
- UNIT III. Internet time and date client, Internet pring client, XNS echo client, TFTP protocol, data formats, connections, client user interface, UDP and TCP implementation.

### SECTION - B

- UNIT IV. Remote command execution, rmed function and rshd server, rexec function and rexecd server, remote login, rlogin overview, rlogin client and rlogin server, pseudo terminals and terminal modes.
- UNIT V. Remote procedure calls, common stubs, introduction, transparency issues, Sun RPC, exception handling, call semantics, data representation, performance and security.
- UNIT VI. Domain name system, structure of computer names, DNS, client server model. DNS server hierarchy, Resolving names, Types of DNS entries, configuring the DNS.

**“Note :** Theory paper should be based on concepts along with algorithms only.”

**LABORATORY :** Minimum 8 experiments based on above syllabus.

**Textbook :**

1. Unix Network Programming by W.Richard Stevens (PHI)

**Reference Books :**

1. Computer Networks and Communication by Douglas E. Comer (Pearson Education Asia)
2. Data & Computer Communications W. Stallings (Pearson)
3. Computer Networks : Kurose (Pearson)

**7 SN 4 REAL TIME & EMBEDDED SYSTEMS****SECTION-A**

- UNIT-I Introduction to embedded systems, Processor in the system, Hardware units required in the exemplary cases, Software embedded into a system. Final Machine implement able software for a product, Software in Processor specific assembly language and high level language, Device drivers device management using an operating systems, Software design for scheduling multiple tasks and devices using RTOS, Embedded SoC and in VLSI circuits.
- UNIT-II Structural units of the processor, Allocation of memory to program segment and blocks, memory map of the system, Memory blocks for different data sets and structures, serial communication using I<sup>2</sup>C, CAN and advanced I/O buses between the networked multiple devices, Device drivers, Virtual Devices, Device drivers for parallel port, serial and timing devices, Context and periods for context switching, deadline and interrupt latency.
- UNIT-III Software programming in assembly language and C, Use of data structures, Queues, Stacks, Lists and Trees, Function pointers, Function queues and ISR queues, Queues for implementing protocol for a network, Queuing of functions on interrupts, Use of FIFO queues, Stacks, Lists and Ordered Lists, Embedded programming

**SECTION-B**

- UNIT-IV Modeling process, Use of dataflow & control data flow graphs, Programming model for event controlled or response time constraint, Real time programs, Inter process Communication and Synchronization, Multiple processes in an application, Sharing data by multiple tasks, use of finite states machine model & Petri net Model, Process, Tasks, Threads.

- UNIT-V Use of Semaphores for a task or for Critical section of code, Mutex & P & V, Priority inversion problems & deadlock situations IPC issues, Use of Semaphore flags or Mutex as resource key, use of message queues, mailboxes, pipes, virtual sockets, RPCs.

- UNIT-VI Introduction to RTOS, OS Services, RTOS Services, Schedule management for multiple tasks in Real Time, Handling of interrupt source call, RTOS task scheduling models, Cooperative Round Robin Scheduling using a Circular Queue of ready tasks and using and Ordered list as per precedence constraints, Cycling scheduling in Time Sharing, Preemptive scheduling, Critical section service by preemptive scheduler, fixed Real Time scheduling, Precedence assignment in Scheduling algorithms. Performance metrics, IEEE Standard POSIX 1003.1B, fifteen-point strategy for Synchronization, Embedded Linux Kernel.

**PRACTICALS :** Minimum 12 experiments based on above syllabus.

**TEXT BOOK:**

1. Rajkamal Embedded Systems, Architecture, Programming & Design, TMH.

**REFERENCES:**

1. Real Time Systems, Jane W. S. Liu, Pearson Education
2. Embedded System Design, A Unified Hardware/Software Introduction, Frank Vahid, Tony Givargis, John Wiley & Sons P Ltd

**7SN5****ELECTIVE-I****(1) MODELING & SIMULATION**

- UNIT I: System Models and System Studies

Basic concepts of systems and system modeling static and dynamic/physical and mathematical models-principles used in modeling-corporate models-analysis, design and postulation of systems.

- UNIT II: Basic Concepts and continuous systems (1.3,4)

Techniques used-comparisons of analytical methods and simulation-numerical techniques-distributed log models and cobweb models continuous system model- Analytical equations and methods of obtaining solutions-analog and hybrid computers and simulations CSSLS examples of different continuous systems.

UNIT III: System dynamics, probability concepts and basic principles of discrete simulation (1/5,6)

Growth and decay models system dynamics diagrams examples-stochastic process-probability functions and their evaluation-random number generation-rejection method-comparison of Monte-Carlo method and stochastic simulation-examples.

UNIT IV: Simulation of Queueing System and PERT Network (2/4,5)

Simulation of Queueing systems: Rudiments of queueing theory, simulation of a single server queue, simulation of a two-server queue, simulation of more general queues.

Simulation of a PERT Network: Network model of a project, Analysis of an activity network, critical path computation, and uncertainties in activity durations, simulation of an activity network.

UNIT V: Simulation of Inventory Control & Forecasting Design and Evaluation of Simulation Experiments (2/6,7)

Inventory Control and Forecasting: Elements of inventory theory, more complex inventory models, simulation example-1, Generation of Poisson and Erlang variates, Simulation example-2, Forecasting and regression analysis.

Design and Evaluation of Simulation Experiments: Length of simulation runs, variance reduction techniques, Experimental layout, validation, summary and conclusions.

UNIT VI: Simulation Languages and Introduction to GPSS (1/9,10)

Different special purpose languages used for continuous and discrete systems and comparison-factors affecting the selection of discrete system simulation language-comparison of GPSS and SIMSCRIPT. A detailed study of GPSS with examples.

#### TEXT BOOKS:

1. Groffrey Gordon "System Simulation", IInd Edition, PHI Pvt. Ltd., New Delhi-1987.
2. Narsingh Deo, "System Simulation with Digital Computers" PHI Pvt. Ltd., New Delhi.

#### REFERENCES:

1. Shannon R.E., "System Simulation: The Art of Science" Prentice Hall, Englewood Cliffs, NY, 1975.
2. Hugh J. Watson, John H. Blackstone, Jr., "Computer Simulation" IInd Edition, John Wiley & Sons.

3. James A. Payne "Introduction to Simulation: Programming Techniques and Methods of Analysis", McGraw Hill, Computer Science Series.

**Note: 1/5, 6 means 5<sup>th</sup> and 6<sup>th</sup> chapters and textbook 1.**

7SN5

#### ELECTIVE-I

#### (2) DISTRIBUTED OPERATING SYSTEM

UNIT-I Fundamentals: What is distributed Computing System: DCS models, What is distributed operating system. Issues, introduction to DCE, Computer networks: network types, LAN and WAN technologies, Communication protocols, Internet working. (8)

UNIT-II Message passing :

Introduction: Desirable features, Issue in IPC by message passing Synchronization, Buffering, Multidatagram messages, encoding and decoding of message data, process addressing, failure handling, Group Communication, case study 4.3 BSD UNIX IPC mechanism. (8)

UNIT-III Remote Procedure Call :

RPC Model, Transparency of RPC Implementing RPC mechanism, abut generation, RPC messages, Marshaling arguments and results, Server management, Parameter passing semantics, Call semantics, Communication protocols for RPC, Client Server binding, Exception handling, Security, RPC in heterogeneous environments, Optimization for better performance. (8)

UNIT-IV Distributed Shared Memory :

Introduction, General architecture of DSM system, Design and Implementation, issues of DSM, Granularity, Structure of shared memory space, Consistency models, Replacement strategy, Thrashing, Other approaches to DSM, Advantages of distributed shared memory. (8)

UNIT-V Synchronization : Clock synchronization, Event ordering Mutual exclusion Deadlock, Election algorithms. (8)

UNIT-VI Distributed File System :

Introduction, Desirable features of good Distributed file system, file models, File Accessing, Sharing, Caching methods, File replication, Fault tolerance, Atomic transactions, Design principles. (8)

**Text Book :**

P.K. Sinha : Distributed Operation System, Concepts and Design, IEEE Press, PHI

**Reference Book:**

A. S. Tanenbaum : Distributed Operating System, Pearson Education Asia.

7SN5

**ELECTIVE-I****(3) MANAGEMENT INFORMATION SYSTEMS**

- UNIT-I MIS concepts, definition, Role, Impact of MIS, MIS and computers, MIS and academics, MIS support to Management, Role and importance of management. MIS and process of management MIS in org<sup>n</sup> structure and strategic management business.
- UNIT-II Basics of MIS : Decision making, Decision methods, behavioral concepts, organizational decision making, MIS and decision making concepts, Information; concepts and classification, Methods of data and information collection: value of information, organization and information. Human as an information processor. Development of MIS and choice of IT.
- UNIT-III Applications of MIS : Applications in manufacturing sector, applications in service sector, Introduction to service, sector, Creating a destructive services, MIS applications in service industries and role of MIS in source industries.  
DSS: Concepts and philosophy, deterministic systems and knowledge based expert systems. MIS and role of DSS. MIS in Enterprise Management System.
- UNIT-IV Technology in MIS : Data processing, Transaction processing, Application processing, Information System processing, TQM of IS.  
DBMS: Object Oriented Technologies, client Server Arch. And MIS.
- UNIT-V MIS and Networks : Network Topology, LAN, Data Communication, ATM Technology, Business Process Re-engineering: Introduction BP, Process Model of organization, Value stream model, Delays in BP, Relevance of IT, MIS and BPR.
- UNIT-VI MIS and Datawarehouse : Architecture, Design and Justification of datawarehouse, organization. Management and implementation of data -warehousing, E-Business:

Models, WWW, E-payment, security in E-business, MIS and E-business.

**Text Book :**

W. S. Jawadekar : Management Information System (II Edition), (TMH)

**Reference Book :**

Kenneth C. Landon & J. P. Landon : Management Information System, 8<sup>th</sup> Ed. Pearson Education.

7SN5

**ELECTIVE-I****(4) DATA WAREHOUSING AND MINING****SECTION-A**

- UNIT I: Introduction, Data mining, Data mining functions, classification and major issues.  
Data Preprocessing : Data cleaning, data integration and transformation, data reduction, discretisation & concept hierarchy generation. (10 hours)
- UNIT II : Data mining primitives : Data mining primitives, data mining query language.  
Concept description : concept description, data generalization, Analytical characterization, mining class comparison. (8)
- UNIT III : Application and trends in data mining : data mining applications, data mining systems and research prototypes, additional themes on data mining, trends in data mining (8)

**SECTION-B**

- UNIT IV : Data ware house and OLAP Technology for data mining :  
What is data ware house, multidimensional data model, data ware house architecture, data ware house implementation. (8)
- UNIT V : Data Staging : overview, plan effectively, dimension table staging, fact table loads and ware house operations, data quality and cleansing, miscellaneous issues. (8)
- UNIT VI : Building end user applications : role of end user application, application specification, end user application development, maintaining and growing data ware house : manage the existing data ware house environment, prepare for growth and evaluation. (8)

**Text Books :**

1. J. Han and M.Kamber : Data Mining Concepts and Techniques, Elsevier Pub. Indian Reprint, 2004.
2. R. Kimball : The Data Ware House Life Cycle Tool Kit, Wiley Press,

**Reference Books :**

1. Berson : Data Ware Housing, Data Mining and OLAP, Tata McGraw Hill.
2. Arun K. Pujari : Data Mining Techniques, University Press (Orient Longman)

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**EIGHTSEMESTER****8 SRN1****DIGITAL SIGNAL PROCESSING****SECTION-A**

( 8 Hrs./Unit)

Unit I: Discrete –Time Signals and Systems:

Introduction to DSP, Advantages, basic elements of DSP system, sampling theorem, A/D, D/A conversion, quantization. Elementary discrete-time sequences. Discrete-time systems: description, representation, classification (linear, time-invariant, static, casual, stable)

Unit II: Analysis of DTLTI systems:

The convolution sum, properties of convolution, Analysis of causal LTI systems, stability of LTI systems, step response of LTI systems, difference equation, recursive & non recursive discrete-time systems, solution of difference equations, Impulse response of LTI recursive system. Correlation of discrete time signals.

Unit III: z- Transform and Analysis of LTI Systems:

Definition of z- Transform, properties, rational z-Transforms, evaluation of the inverse z- Transforms, analysis of linear time invariant systems in z-domain, transient and steady-state responses, causality, stability, pole-zero cancellation, the Schur-Cohn stability test

**SECTION-B**

Unit IV: Fourier Transforms, the DFT and FFT:

Definition & properties of Fourier transform, relation with z-transform. Finite duration sequences and the discrete Fourier transform(DFT), properties, circular convolution, Fast algorithms for the computation of DFT: radix-2 and radix-4 FFT algorithms

Unit V: Design of Digital Filters:

Classification of filters: LP, HP, BP, FIR and IIR filters, filter specifications. Design of FIR filters using Windows and by

Frequency sampling methods. Design of IIR filters from Analog filters using approximation of derivatives, Impulse invariant transformation, Bilinear transformation and Matched z-Transformation, Commonly used Analog filters and IIR Filter design example

Unit VI: Realization of Discrete-Time systems:

Structures for realization of Discrete-Time systems, realization of FIR systems: Direct Form, Cascade Form, Frequency sampling and Lattice structures. Realization of IIR filters: Direct Form, Signal flow graph and Transposed structures, Cascade form, Lattice and Lattice-ladder. Realization for IIR systems.

**Text Book :**

J G Prokis and D G Manolokis, “Digital Signal Processing: Principles Algorithms and Applications (Pearson Education)

**References:**

1. S K Mitra: “Digital Signal Processing: A Computer-Based Approach” (McGraw Hill)
2. E C Ifeachor and B W Jervis “Digital Signal Processing A Practical Approach” (Pearson Education)
3. A V Oppenheim, R W Schafer with J R Buck “Discrete Time Signal Processing”(PHI)

**8 SRN 1****D.S.P. LABORATORY**

Minimum 12 examples based on above syllabus. Design may be implemented using C-programs or Matlab or TMS 320 C 25 SDK or combination thereof.

**8SN2****NETWORK ADMINISTRATION AND SECURITY****SECTION-A**

UNIT I.

Introduction to network security, passive and active attacks, authentication, integrity, access control, The model of internetwork security, internet standards : the internet society and RFC publications (Request for comments.)

UNIT II.

Cryptography : Encryption principles and various algorithms, standardization process, key distribution, public key cryptography and message authentication, digital signature.

UNIT III.

Network security applications : Kerberos, X.509 directory authentication services, e-mail security PGP (Pretty Good Privacy) operational description. MIME (Multipurpose

Internet Mail Extensions), S MIME (Security/Multipurpose internet mail extensions) functionality.

### SECTION-B

- UNIT IV. IP Security : Overview, IP security architecture, Authentication header, Web Security : Web security requirements, secure socket layer SSL, Transport layer security TLS, Secure electronic transactions TES.
- UNIT V. Network Management Security : Basic concepts of SNMP, Network management architecture and protocol architectures, proxies, services, SNMPv1 authentication service, access policy and proxy service, SNMPv2 architecture, message processing and user security model, view based access control.
- UNIT VI. System Security : Intruders, Intrusion technologies, password protection, password selection strategies, Intrusion detection, viruses and related threats : Nature of viruses, types, micro viruses and various antivirus approaches. Firewall : Characteristics, types of fire walls, Firewall configuration, Trusted systems, data access control, the concept of the trusted systems.

**PRACTICALS :** Minimum 8 experiments based on above syllabus.

#### Text Book :

Network Security Essentials - William Stallings (Pearson Edu. Asia)

#### Reference Books :

1. Security for Telecommunication and Network management by Moshe Rozenbit (PHI)
2. Internet Security Protocols - Protecting IP Traffic, by Uyles Black (Pearson Edu. Asia)

### 8SN3

#### ELECTIVE II

#### (1) ELECTRONIC COMMERCE

##### SECTION A

- UNIT-I Basic web commerce concepts, electronic commerce modes: overview, EDI, electronic commerce with www-internet, commerce net advocacy. (10)
- UNIT-II Approach to safe E-commerce:-secure transport protocol and transaction, SEPP,SET, certificate for authentication, security on web server and enterprise network. (8)

- UNIT-III Electronic cash and Electronic payment scheme:Internet monetary payment and security requirements; Payment & purchase order process, Online Electronic cash. (8)

### SECTION B

- UNIT-IV Internet/Intranet Security issues and solutions:  
Needs for computer security, security strategies, Encryption. MasterCard/visa secure Electronic Transaction: Introduction requirements and concepts, payment processing. (10)
- UNIT-V Secure E-mail Technologies:  
Introduction, means of distribution, models for message handling, How does Email work?  
MIME, S/MIME, moss comparisons of security methods, MIME and Related facilities for EDI over the internet.(9)
- UNIT-VI Internet & web site Establishment:  
Internet Resources for commerce: introduction, Web server Technologies, internet tools Relevant to commerce, internet applications for commerce, internet Access and Architecture, Internet searching. (10)

#### Text book :

Daniel Minoli & Emma Minoli : Web Commerce Technology Hand Book

### 8SN3

#### ELECTIVE-II

#### (2) COMPUTER GRAPHICS

##### SECTION-A

- UNIT I. Overview of Graphics Systems : Video display devices, Raster scale systems. Graphics monitors and workstations. Input devices, Hard copy devices, Graphics software, survey of computer graphics applications.
- UNIT II. Output Primitives : Points and lines, Line drawing algorithms, Line functions, Circle generating algorithms, Ellipse generating algorithms, other curves, Parallel curve algorithms. Pixel addressing, Filled area primitives using functions. Cell array. Character generation.
- UNIT III. Attributes of output primitivies : Line attributes, curve attributes, color level, area fill attributes, character and bundle attributes. Anti aliasing. 2-D geometric transformations, basic and composite transformations. Reflection and sheer.

##### SECTION-B

- UNIT-IV. 2-D Viewing : Viewing pipeline, viewing co-ordinate reference frame and co-ordinanate transformations, 2-D viewing

functions. Clipping operations and point, line, polygon, curve, Text and exterior clipping, Structure concepts and hierarcial modeling with structures.

UNIT V. GUI : Uses dialogue. Input of graphical data, Input functions, initial values, Interactive picture construction techniques, virtual reality environment, 3-D concepts, 3-D display methods.

UNIT VI. 3-D Object Representations : Polygon surfaces, curved lines and surfaces, Quadric surfaces, Super quadrics, Blobby objects, Spline representations, Cubic spline, Bezier curves and surfaces, B-spline curves and surfaces. Displaying spline curves and surfaces.

**Text Book :**

1. D.Hearn and M.P.Baker : Computer Graphics 'C' Version, 2/e (PHI)

**Reference Books :**

1. S.Harrington : Computer Graphics - A Programming Approach (McH)
2. Rogers : Procedural Elements for Computer Graphics (McH)
3. Newman and Sproute : Principles of Interactive Computer Graphics.

**8SN3**

**ELECTIVE-II**

**(3) DISTRIBUTED DATABASE MANAGEMENT SYSTEM**

UNIT-I Introduction to DDBS: Introduction, Promises of DDBs, Problem areas. Overview of Relational DBMS: RDBMS concept, Normalization, Integrity Rules. Review of Computer Networks: Data Communication Concepts, Types of Network, Protocol Standard. (8)

UNIT-II Distributed DBMS architecture: DBMS standardization, Architectural Models, Distributed DBMS arch. Distributed Database Design: Alternative Design Strategies, Distributed Design issues, Fragmentation, Allocation Semantic Data Control: View Management, Data Security, Semantic Integrity Control. (8)

UNIT-III Overview of Query Processing: Problem & objectives of Query Processing, Characteristics of Query processors, Layers of Query processing. (9)

UNIT-IV Distributed Transaction management and Concurrency control: Definition, Properties and types of Transaction. Distributed Concurrency control: Serilizability, Taxonomy, Locking based concurrency control algorithms, Deadlock management. (9)

UNIT-V Distributed DBMS reliability: Reliability concepts and measures, Failures and Fault tolerance in distributed systems, Failures in DDBMS, Local reliability protocols, dealing with site failures. (8)

UNIT-VI Distributed Object Database Management Systems: Fundamental, Design and Architectural issues of ODBMS, Current issues: Data Delivery Alternatives, Dataware housing. World wide web, Mobile databases. (8)

**Text Book :**

1. M. Tamer Oizsu and Patrick Valdurlez : Principles of Distributed Database Systems, 2<sup>nd</sup> ed. (Text Book) Person Education, LPE.
2. Ceri and Palgetti : Distributed Database System-(Reference Book) TMH.

**8SRN4**

**INTERNET TECHNOLOGIES**

**SECTION-A**

UNIT I. Servlets in Java; Introduction, Servlet structure & lifecycle. Servlet API basics, Various classes & interfaces. Servlet requirements & writing. Running and debugging of Servlets: Servlet Debug Class.

UNIT II. HTTP Redirects & Servlet API; Concepts of cookies, Servlets & cookies. State and session management with Servlet API. Server side includes and request forwarding. Servlet chaining. Jdbc Servlets.

UNIT III. Introduction to XML; Writing XML, creating a DTD, elements & attitudes definitions. XML schema. Defining simple & complex types. Namespaces, schemas and validation.

**SECTION-B**

UNIT IV. Cascading Style Sheets (CSS) L & XML; anatomy of a style, creating and calling stylesheets for an XML/HTML document. Layout with CSS. setting up various properties of elements using CSS. Formatting Text with CSS.

UNIT V. Introduction to JSP; Simple JSP & concepts, Request-time expressions. Concept of Beans, Bean instances & serialization; Advanced JSPs: Scripts. conditionals, loops, Try/Catch, Beans & Scriptlets.

UNIT VI. Bean Scopes, Writing Beans. Jdbc & Beans. Dynamic Ads and E-commerce concepts. Using Scopes from Servlets, Using Beans from servlets. JSP classes. JSPs and XML.

**Books :**

1. Dustin R Callaway : Inside Servlets Pearson Education (LPE)
2. XML Related Technologies and Programming in Java by IBM EEE (PHI).
3. Larne Pekowasky: Java Server Pages, Pearson Education (LPE)
4. Dietel & Dietel : WWW : How To Program , Pearson Education (LPE)
5. Deitel, Nieto, Lin, Sadhu : XML: How to Program, Pearson Education.
6. J. Wigglesworth & P McMillan “Java Programming: Advanced Topics” (Thomson).
7. J C Jackson “Web Technologies” Pearson Education (LPE).

**8SRN4****INTERNET TECHNOLOGIES LAB**

## LIST OF PROGRAMMES

The sample list of program is given below. This list can be used as guide line 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 study concept of client-Server system, working of Client, working of Server and kinds of Client- Server
- 2
  - a) Introduction to Servlets that describe the servlet Life cycle with various Http methods, Advantages of Servlet user CGI
  - b) Write a simple Servlet oriented program to print “Hello World” on a client machine
- 3 Write a program to create cookies that accepts Personal information in a Form from the user and whenever the user clicks “Submit” button cookie will be sent and when the user retrieves cookie from his site the values sent in the cookie should be display on the HTML page
- 4 Write a program to design and implement customer Registration system which allows you (Customers) to register themselves with your site. The data is captured by Servlet and stored in the database using JDBC
- 5 Write a program using Session that selects the programming language and when Submit button is clicked a page with Session information gets displayed along with the information for selecting another language and other to get recommended books which displays the requested page when clicked
- 6 Write a program to create a DTD for Library System.

- 7 Write a program to create a Bean that will create a Rectangle with color property in it and set its various properties like Height, width etc
- 8 Write a program to implement the program for Quiz using JSP
- 9 Implement one mini Project using Servlet, Cookies, JDBC, JSP

**8SN5****PROJECT AND SEMINAR**

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