UNIVERSITY OF RAJASTHAN, JAIPUR

SYLLABUS

SCHEME OF EXAMINATION AND
COURSES OF STUDY

FACULTY OF SCIENCE
B.Sc./M.Sc. INFORMATION TECHNOLOGY INTEGRATED

SHIV BOOK DEPOT
Opp. Tadkeshwar Temple, 167, Chaura Rasta, Jaipur

NOTICE

1. The Ordinance governing the examinations in the Faculties of Arts, Fine Arts, Social Sciences, Science, Commerce and Law are contained in separate booklet. The students are advised to refer to the same.

2. Changes in Statutes / Ordinance / Rules / Regulations / Syllabi and Books may, from time to time, be made by amendment or re-making, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change.

3. All court case shall be subject to the jurisdiction of the Rajasthan University head quarter at Jaipur only and not any other place.

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B.Sc. Information Technology Integrated
M.Sc Information Technology Integrated

The Syllabus for B.Sc.-M.Sc. Five Year Integrated Course in Information Technology, recommended by previous C.O.C. in its meeting held on June 17, 2006 at 12.30 PM in VC Secretariat was presented in the Faculty of Science meeting held on 11-7-2006. The Faculty of Science has approved the syllabus (Vide F. No. 7(2)/ Acad. I/2006/4514-823 dated 2-09-2006. sub : Minutes of the meeting of Faculty of Science held on 11-07-2006). However the syllabus does not specify the eligibility for admission. Scheme of Examination, Pattern of Questions papers, and related issues. In this regard the recommendations of the C.O. Care as follows:

The following should be appended in the Syllabus :

UNIVERSITY OF RAJASTHAN

B.Sc.-M.Sc. Five Year Integrnatned Course in Information Technology (5 Years/10 Semester Course)

1. **Eligibility for Admission :**
   (i) Candidate who have passed 12th standard examination under 10+2 Scheme of Board of Secondary Education Rajasthan, CBSE or any equivalent examination of recognized Board with any two of the following subjects :
   Physics, Chemistry, Mathematics, Informatics Practices, Computer Science, Computer Applications, Information Technology, Multimedia & Web technology. The minimum pass perncetage for admission to the course is 55% (45% for SC/ST).
   (ii) The candidates who have appeared for and are expecting their results on or before 30th June of the respective final qualifying examinations are also eligible to apply.
2. **Scheme of Examination (All Semesters (Semester I to Semester X) :**
   (i) Each Theory Paper shall carry 100 marks (70 marks for written semester examination and 30 marks for internal assessment the semester examination will be of 3 hours duration and consisting of Five questions in each paper based on the pattern specified below:

- First question will contain 10 parts each having one/two line answer, with each part carrying a weight of 1 mark (i.e. Q. 1- Marks 1×1=10) and covering the full course content of the paper.
- **Second question** will contain 5 parts each having maximum 50 words answer, with each part carrying a weight of 2 marks (i.e., Q.2- Marks 5×2=10) and covering the the full course content of the paper.
- Third question will contain 5 parts each having maximum 150 words answer, with each carrying a weight of 4 marks (i.e. Q. 3- Marks 5×4=20) and covering the full course content of the paper.
- **Fourth Question will contain 2 parts each, with each part carrying weight of 10 marks (i.e. Q. 4- Marks 2×10=20).**
- **Fifth question** will have interal choice and carry a weight of 10 marks (i.e., Q. 5-Marks 1×10=10).

(ii) **Practical Paper in I semester:** For paper 1 (Computer Lab) carrying 150 marks (100 marks for semester Practical Examination and 50 marks for Internal examination) the duration of examination will be of five hours and involve practical exercises and Viva-voice examination. For paper II (Communication Lab) carrying 50 marks (30 marks for semester Practical Examination and 20 marks for Internal Examination) the duration of Examination will be of 3 hours and involve written exercises and Viva-coice examination. The Semester Practical examination will be conducted by one external Examiner (appointed by the University) and one iternal examiner (appointed by the Head of the Department).

(iii) **Each Practical Paper (Semester II to Semester IX)** carry 100 marks (70 marks for semester practical examination and 30 marks for internal assessment). The semester practical examination (each) will bne of five hours duratio and involve practical examination (each) will be of five hours duration and involve practical exercises and viva-voice examination. The Semester Practical examination will be conducted by one external Examiner (appointed by the

University) and one internal examiner (appointed by the Head of the Department).

(iv) The Project work in the Semester X is of 600 marks. Project Examination will be conducted by a Board of One External Examiner and Two Internal Examiners. The distribution of marks will be as follows: Project Work-400 Marks, Viva-Voce- 100 Marks and Presentation-100 Marks.

3. In respect of Theory Papers, the internal assessment will be based on assignments/periodical tests/interactive participation in the clnanss nas detnermined by the concerned teacher.
4. In respect of Practical Papers, the internal assessment will be based on activities in laboratory/regularity/practical record.
5. The medium of instruction and examination shall be English only.
6. (a) The minimum marks for passing each theory/practical examination shall be 40% separately in the Semester examination and internal assessment.

   (b) The candidate will be promoted from Semester I to Semester II if he/she hass cleared three theory papers and one practical paper of Semester I.

   (c) The candidate will be promoted to the Semester III and onwards up to Semester V if he/she has cleared two-third papers of all theory papers of all previous semester taen together separately, and two-third papers of all practical papers of all previous semesters taken together separately.

   (d) The candidate will be promoted to Semester VI only if he/she has cleared all the theory papers and all the practical papers of Semester I and II, and the total number nof due papers of Semesnter III, IV and V (taken together) do not exceed five theory papers and one practical paper. The candidate who is ineligible for admission to Semester VI due to the above condition may appear in the due papers when the University conducts regular examination for the concerned Semester.

   (e) The candidates may appear three times (overall) in a paper. On failing in all the three attempts he/she will have to appear in all papers of the semester concerned.

(f) The number of extra attempts availed in passing a paper will be mentioned on the mark-sheet.

(g) Supplementary Examination for oly those students who have appeared in the VI Semester Examination and failed, but whose total number of due papers (including Semester VI result) do not exceed Five theory papers and One practical paper, may be conducted by the University. The candidates not fulfilling the above condition may appear in the due papers when the University conducts regular examination for the concerned Semester. The actual marks obtained by the candidate in due papers will bne counted for the purpose of percentage of marks calculation.

(h) There shall be no provision of reappearing in a cleared paper for the purpose of improvement of marks obtained.

7. It will be necessary for a candidate to pass in the theory papers as wnell as practical papers separately. On successful clearing of all papers of Semester I (first) to Semester VI (sixth), the candidate will be awarded B.Sc. (Integrated) degree. The word integrated is introduced to distinguish this degree from the conventional B.Sc. degree currently being awarded by the University for a three year Degree Course with different Course contents and Syllabus.

Classification of successful candidates shall be as follows:

First Division—60% or more of the aggregate marks.

Second Division—48% or more but less than 60% of the aggregate marks.

All the rest will be declared to have passed the examination, if they obtain a minimum pass marks in each paper viz. 40%.

8. For admission in VII (seventh) semester a candidate must not have back log of any paper of I (first) to VI (sixth) semesters. No direct admission in M.Sc. (Integrated) (VII Semester of this Five Year Integrated course) is admissible.

(a) The candidate may be promoted from Semester VII to the next semester (Up to Semester X) if he/she has cleared three-fourth papers of Theory and Practical papers taken together of previous semesters (from Semester VII onwards).

(b) The candidates may appear three times (overall) in a paper.

On failing in all the three attempts he/she will have to appear in nall papers onf the semester concerned.

(d) The number of extra attempts availed in passing a paper will be mentioned on the mark-sheet.

9. It will be necessary for a candidate to pass in the theory papers as well as practical papers separately. On successful clearing of all papers of VII (Seventh) to X (Tenth) semester, the candidate will be awarded M.Sc. (Integrated) (Information Technology). The word "integrated" is introduced to distinguish it from the regular M.Sc. (Information Technology) degree currently being awarded by the University for a Different Course Content and syllabus.

Classification of successful candidates shall be as follows

First Division—60% or more of the aggregate marks.

Second Division—48% or more but less than 60% of the aggregate marks.

All the rest will be declared to have passed the examination, if they obtain a minimum pass marks in each paper viz. 40%.

10. The teaching hours and Evaluation scheme will be as given in the beginning of syllabus for each Semester.

B.Sc.-M.Sc. Five Year Integrated Course in (IT)

Semester I

Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
101	Mathematics and Statistics	5	-	3	70	2	30	100
102	Computer Fundamentals	4	-	3	70	2	30	100
103	Computer Programming & Programming Methodology using For TRAN 77	4	-	3	70	2	30	100
104	PC Software & Hardware Troubleshooting	5	-	3	70	2	30	100
105	Communication Skills	2	-	3	70	2	30	100
106-1	Practical I (FORTRAN & Software Lab)		8	5	50+50 =100	3	50	150

106-II	Practical II (Communication Lab)	2	3	30	2	20	50
	Total	30		480		220	700

M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semenster I

Paper Title : Mathematics and Statistics (101)

1. **Relation :**
   Cartesian Product of sets; relations as sets of ordered pairs; types of relations; Properties of relations; Congruence relations; Equivalent classes;
2. **Functions :**
   Functions as sets of ordered pairs; Types of functions; Equality of functions; Algebra of functions; Composition of two functions; Inverse functions; Characteristics functions; Functions in Business economics; Equilibrium prices.
   Binary operations; Properties of Binary operations.
3. **Theory of Matrices :**
   Matrices; Types of matrices; Equality of matrices; Operations on matrices; Properties of Operations Singular Matrices; Invernse of Matrix; Adjoint of Matrix; Rank of Matrices; Elementary Row/Column transformations; Row/Column equivalent canonical forms; Inverse using enlementary transnformation; Solution of a system of linear equation using elemetary transformations.
4. **Basic Statistics :**
   Introduction : Definitions Merits and demerits : Frequency distributions and frequency charts;
   Measures of Central tendecy : Arithmetic mean; geometric mean; Harmonic mean; Median; Mode; Quartiels, Deciles and Percentils.
   Measures of Dispersion : Range, Quartile deviation: Nean deviation; Standard deviation; Skewness and Kurtosis.
5. **Probability Theory :**
   Introduction : Definition; Sample spaces : Events : Types of events; algebra of events; Conditional Probability; theorems on probability; Baye's theorem.

6. Random variables and distributions :

Random variables (discrete and contimuous); Mathematical expectations and Variance. Discrete Probability Distributions : Binomial distribution; Density functnio; Mean and variance of the Distribution Properties and uses.

Poisson Distributions : Density function; Mean and Variance of the distribution, properties and uses.

Main Readings :

1. C.L. Liu : Elemets of Discrete Mathematics, 2nd Edition: McGraw Hill 1985.
2. B.S. Vatssa : Discrete Mathematics; Wishwa Prakashan.
3. K.B. Datta : Matrix and Linear algebra; Prentice Hall of India; 1991.

Supplementary Reading :

1. B.L. Agrawal : Bacis Statistics (1996). New-age International Publishers, New Delhi
2. A.M. Goon; M.K. Gupta & Dasgupta; Fundamentals of Statistics (Vol. 1) (1986)
3. Kapur and Gupta : Fundamentals of mathematical Statistics; S. Chand and Co.

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster I

Paper Title : Computer Fundamentals (102)

1. Introduction :

History of Development of Computers, Hardware, Software, Firmware and Operating systems, Types of Computers.

2. Basic Computer Architecture

Block Diagram, CPU architecture, Memory Organization, Addressing Techniques and Modes, Instruction exnnecnutio.

3. Memory & Devices

RAM, ROM, PROM, EPROM, EEPROM, Extended memory, Expanded Memory. Virtual memory, Cache memory

I/O and Secondary storage devices : Floppy Disks, Hard Disk, VDU, Mouse, CD-ROM, Printers, Modem, Plotter, Web Camera, Joysticks, etc.

Disk Architecture

4. **Number System & Codes**
   Various Number Systems and Arithmetic, Conversion of Numbers, Characnter Codes (ASCII, EBCDIC, BCD, Excess-3, Gray etc.), Biary and Hexadecimal Arithmetic.
5. **Introduction to DOS and DOS Commands**
   Also Introduction to other operating systems like UNIX, WINDOWS, LINUX.

Mai Readings :

1. Computer Fundamentals—V Rajaraman, PHI
2. Computer Fundamentals- P.K. Sinha, BPB
3. Using MS-DOS-Wyatt, PHI

Supplementary Readings :

1. Computer and Commonsense-Hunt & Shelley, PHI
2. Peter Norton complete guide to DOS 6.22 — Peter Norton-PHI
3. Insinde IBM PC — Petner Norton, TMH.

M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semenster I

Paper Title : Computer Programming & Programming Methodology using FORTRAN-77 (103)

1. **Algorithnm & Flowcharting :**
2. **Programming Language & Structured Programming**
   Structured programming, Levels of Programming languages, Compiler/Interpreter, Editor, Problem Analysis
3. **Program Bugs & Testing**
   Program Bugs, Preparing Test data, Functional & Structural Testig
4. **Constats & Variables**
   Character Set, constants, Variables — need & definition
5. **Expressions & Operators**
   Operators. Expression, Evaluation & NAssingnnment of Expression
6. **Input & Output Statements.**
7. **Jumping, Branching & Looping Statements**
8. **Mathematical & String Built-in functions**
9. **Array**
10. **User Defined Functions and Procedures**

11. File Organization

Sequential, Binary

Random

Main Readings :

1. Programming in For Tran 77- Rajaraman
2. For Tran 77- Schaum's Series-TMH

Supplemetary Readings :

1. Structured Programming Concepts- La Buddee- Mc. Graw Hill
2. Foundations of Programming-James-BPB

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster I

Paper Title : PC Software & hardware Troubleshooting (104)

1. Introduction :

Concept of Window, Icon, Menu, Desktop, Creantig Folder and Shortcuts, Finding Files and Folders, Creating Copying, Moving and Deleting files, Adding in nand deleting rom Start menu, Window Explorer, Elementary Commands.

2. Word Processing Package

Typig, Editing, Proofing & Reviewing, Formating Text & Paragraphs,

Automatic Formatting & Styles, Working with Tabnle, GNrapnhincs and Frames Mail Merge, Automating Your Work & Printing Documents

3. Spreadsheet Package

Concept of Worksheet, Workig & Editing In Workbooks, Creating Formats & Links, Protecting ad Hiding data, Built-in Functions, Formatting A Worksheet & creating graphic objects, Creating Charts (Graphs), formatting and analyzing data, Organizing Data in A List (Data Management), Sharing & Importing Data Printing, Macros.

4. Presentation Package

Creating and Editing Slides, Creating and Editing objects in thne Slide, Aimation and Slide transition effects, Creating and Running Slide show, Templates, Interface with other packages.

5. Introduction to PC Hardwanre

PC Functions and Components, Tools & Equipment, System

Configuration, BIOS/CMOS Settings System Resources, Safety and Prevetative maintenance, Cleaning & Preventative mainteance, IDE Devices, SCSI Devices, Peripheral Devices, Motherboard & components, Motherboard Architecture & Troubleshooting, Printners, Printer Connection, Confniguratio & Troubleshnnnnootig entwnorknig & Troubleshooting, Network Cards & Cables, Network Standards.

Main Readings :

1. Mastering Microsoft Office 2000-Cuser-BPB
2. How Computers work - Ron White - Techmedia
3. Upgrading & Repairing PC-QUE
4. Upgrading & Repairing Network - QUE

Supplementary Readings :

1. WORD 6 for Windows Quick & easy Reference - Mansfield - BPB
2. Mastering Word 6 for Windows - Mansfield BPB
3. Using Ms Word 2000-Calabria, Bnurke & Kirkland -PHI
4. Mastering Excel 2000 for Windows - Marting - BPB
5. Using Ms Office 2000- Bott - PHI

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster I

Paper Title : Communication Skills (105)

1. **Introduction :**
   Spoken and Conversational skills for Greetings, Requests, Invitation, Permission, Thanks etc., Paragraph Development, Vocabulary Development.
2. **Readings Skills**
   Model of Reading to learn - P.S.O.R., Reading Tactics and Strategies, Reading Purposes and Meaning, Reading outcmes structure of meaning technique.
3. **Writing Skills**
   Guidelines for effective writing, Writing styles for application, Personal Resume, Business Letter and Memo including Requests, Complains asking quotations etc. Technicnal Report writing. Writing paragraphs on a ginven topic, Developing story from given points

4. **Listening Skills**
   Barriers to listenig, Effective listening Skills, Feedback Skills, Attending Telephone calls, Note taking.
5. **Speaking and Discussion**
   Components of Effective talk/Presentation, Plannig of content of a talk/Presentation, Use of Visual aids, Effective speaking skills, Discussion skills

Main Readings :

1. Chirsle W. Handbook of Practical communication skills - JAICO.
2. S.J. McGrath-Basic Managerial Skills for all- PHI

Supplementary Readings :

1. Reading to learn—Sheila Smith & Thomas M.—Methuen (London)
2. Communincnatio Conversation Practice- Tata McGraw Hill
3. Communication in English- R P Bhatnagar & R T Bell- Orient Longman
4. Good English - G H Vallins - Rupa & Co.
5. Let's Talk English - M. I. Joshi
6. Essetials of Business Communicatios - Pat & Sons, - S. Chand.

Practical-I : FORTRAN & PC Software Lab (106-I)

FORTRAN

1. Simple Input/output programmes of integers, real, characters, and strings.
2. Programming exercises based on If statement, computed Go To statement
3. Programming exercises based on Do Loops
4. Programmig exercises based on Arrays, sbscripted variables
5. Programming exercises based on Functions and subrouties
6. Programming exercises based on Numerical calculations including Hornner's methnodn, umerical integration, linear equations etc.

MS Word

1. General word processing concepts including find and replace etc
2. Introduction to Character formatting
3. Introduction to paragraph formatting, line spacing, bullets and numbering etc.

4. Page formatting concepts
5. Tables and formulae
6. Mail merge
7. Print options, print preview etc.

MS Excel

1. Usingn Formulae in worksheets
2. Cell referencing
3. Using functions in worksheets
4. Using Macros
5. Formatting and Printing options
6. Charts
7. Decision making through scenario-What if Analysis

Ms Power Point

1. Creating slides
2. Background and foreground options-Themes
3. Adding objects-Pictures, Clipart, charts etc
4. Controlling Presentation-Animation, Slide effects etc

Practical-II : Communication Lab (106-II)

1. Sentence Patterns
2. Modification of Sentences
3. Usage of verbs
4. Coditionaln Sentences
5. Reported Speech
6. Passive Voice
7. Proposition etc
8. Spoken English
9. Business Communication

M.Sc. [Five Year Integrated Course]
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Semenster II
Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
201	Mathematics-II	4	-	3	70	2	30	100
202	"C" Programming	4	-	3	70	2	30	100

203	DBMS-I4	4	-	3	70	2	30	100
204	Basic Electronics	4	-	3	70	2	30	100
205	Business Systems-I	4	-	3	70	2	30	100
206-I	Practical I (C Programming and DBMS)		5	5	35+35 =70	3	30	100
206-II	Practical II (Basic Electrones)		5	5	35+35 =70	3	30	100
	Total	30			490		210	700

M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semenster II

Paper Title : Mathematics-II (201)

1. **Basic concept of Graph Theory:**
   Definition of (undirected) graphs; Basic Terminology; Types of undirected graphs; Weighted graphs; Multi graphs, Digraphs; Some applications of graph theory; NTLN's Graph isomorphism; Sub graphs; Walks, Paths and Circuits : Connected graphs and components; Operations on graphs; Fusion of vertices.
2. **Trees :**
   Definitio of a tree; Some important properties; Cut vertices edges; Distance and center; Rooted and Binary trees; Spanning treens; Kruskas algorithm; Prim's algorithm; computer implementation; connectivity; Shortest path problems; (BFS and Dijkstra's Algorithm); separability.
3. **Euler and Hamiltonnia Graphs:**
   Eulerian lines and Euler graphs; Euler's theorem on the existence of Eulerian paths and circuits; Hamiltonia paths and Hamiltonia graphs; The traveling salesman problem; Two optimal algorithm; The colset insertio algorithm.
4. **Plananr graphs:**
   Defiitio; Plane representation of a graph; Kuratowski;s graphs; Euler's formula; Detection of planarity.
5. **Matrix representation of graphs:**
   Incidence matrix; path matrix; Adjacency matrix; Properties; Algorithm (WARSH ALL & MINIMA); Some types of digraphs; Digraphs and binary relation; relation matrix.

Main Reading:-

1. N. Deo : Graph Theory with application to engineering and

computor science; prentice-hall Inc (1974)
2. K.R. Parthsarthy : Basic Graph Theory; Tata McGraw Hill Pub Comp. Ltd; New Delhi (1994)

Supplementary Readings :

1. F. Harry : Graph Theory; Addison- Wesley Pub. Comp. (1972)
2. J.P. Trembly & R.P. Manohar: Discrete Mathematical structures with aplications to Computer Science; McGraw Hill (1975)
3. B. Kolman; R.C. Busby & S. Ross: Discrete Mathematical structures; Prentice Hall of India Pvt. New Delhi (2001)

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster II

Paper Title : "C" Programming (202)

1. **Introduction**
   Language, Language Structure, Various options of Compiler
2. **Constants & Variables**
   Character Set, Constants- Need & Definitionn, Variables- need & definition.
3. **Expressions & Operations**
   Operators, Expression, Evaluation & Assignment of Expression, elementary built-in functions.
4. **Input & Output Functions**
5. **Jumping, Brnaching & Looping Statements**
6. **String Mathematical & Built-in functions**
7. **User Defined Functions**
   Call by value & by reference, Passing Structures & Arrays, Recursion
8. **Program Structure**
   Storage Classes, Automatic Variables, External (Global) Variables, Static Variables.
9. **Array**
   Defining & Processing an Araay, Passing Arrays to a Function, Multidimensional Arrays.
10. **Pointers**
    Pointers and memory Storage, Operations on Pointers, Arrays of Pointers, Pointer to Array, Passing pointers to functinos, I/O statements related to file

11. Structure & Union

12. Data files

Opening ad Closing a File, Creating a Data file, Processing a Data file, Unformatted Data file

Main Readings:

1. C Language Programming -Byron Gottfried -TMH
2. Programming in c - Balaguruswami -TMH
3. Let Us "C" - Yashwant Kanitkar - BPB

Supplementary Readings:

1. Pointers in "C" - Yashwant Kanitkar - BPB
2. "C" Programming Language - Karnigha & Ritchie - TMH
3. The Sprit of "C" - Cooper H. & Mullish H. - Jaico Pub
4. Programming in "C" - Stephan Kochan . -CBS
5. Mastering Turbo "C" - Kelly & Bootle -BPB
6. Mastering Turbo "C" - Stan Kelly - BPB

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster II

Paper Title : Database Management System - I using Visual FoxPRO (203)

1. Database Package:

Introduction, Data base, Record, Field, Capabilities and Limitations of Database System

2. Operators

3. Database & Array Handling

Creation, Editing & Modification, Sorting and Indexing, Processing by writing Programs

4. SET Commands

5. Inbuilt Functions, User Defined Functions and Procedures

6. Scree Handling, Report & Label Generation

7. Generating Menu

POPUP Menus, Bnar Menus, Pull Down Menus

8. Hadling Memo Fields

9. Introduction to Visual FoxPro.

Main Readings :

1. Visual Foxpro 6.0 in 21 days-Sams
2. Visual Foxpro 6.0 Made easy-TMH

3. Foxpro 2.6 for Windows made Simple-R.K. Taxali-BPB

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster II

Paper Title : Basic Electtonics (204)

1. **Fundamentals of Electrical Engineerig**
   Introduction of AC Supply, Voltage, Current, Power, Frequency, Phase & DC supply, Passive components, Resistor, capacitor, Inductor & their properties, Simple R, L & C circuits, Ohm's Law & Kirchoff's laws, series & parallel connection of resistors & capacitors, Heating effect due to current and need of fuses, Voltage source, Ideal Volt source, conversion of voltage source into current source, Thevenin's theorem, maximum power transform theorem, Electromagnetism, Flux, Flux density, Magnetic force, permeability, B-H curve RC time constant, Electromagnetic Induction & transfonrmer, Resonance tank circuits.
2. **Semi conductor Physics:**
   Properties of Semiconductors, Commonly used Semiconductors, Intrinsic & Extrinsic semi conductors, P Type & N Type semiconductors, PN Junction & Biasing.
3. **Semiconductor Diode**
   Diode, symbol, ratings, forward & reverse bias characteristics. Half wave rectifier, full wave rectifier, bridge rectifier, and simple filter circuits Zener diode & its application
4. **Transistor (Introductory concepts**
   PNP & NPN Transistor, CB, CC, CE cofigurations & biasing, Transistor as an Amplifier, Transistor as a switch, Alpha & Beta parameters, Frequency response & bandwidth, RC coupled Transistor Amplifier & Transformer coupled transistor amplifier-their circuit diagram, Audio power amplifier, Push Pull amplifier. Principle of negative feedback in Amplifier & Gain, Transistor tuned amplifier Circuit, Oscillage Circuits, Crystal Oscillator, Different type of signals : Sine Ware, Saw Tooth, Triangular, Pulses, Multi vibrators.
5. **LED, Photo Diode, Photo Transistor, Thermistor, LDR, BCR, Triode, their Characterisntnicns & Applications.**
6. **FET, MOSFET & Construction, Symbol & Basic Circuits, their Advatage over Transistor.**

Main Readings :

1. Principles of Electrical Engineering & Electronics - V.K. Mehta
2. Fundamentals of Electroninens - Ashok Singh

Supplementary Readings :

1. Electrical Technology - B.L. Theraja (Part I)
2. Electronics Principles - Malvino .

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster II

Paper Title : Business System -I (Accounting & Financial Management) (205)

1. **Accounting :**
   Principles, Concepts and Conventions, Double Entry System of Accounting, Introduction of Basic Books of Accounts of Sole Propeietary Concern, Control Accounts for Debtors and Creditors, Closing of Books of Accounts and Preparation of Trial Balance (R)
2. **Final Accounts :**
   Trading, Profit and Loss Accounts, Balance Sheet of Sole Proprietary Concern with Normal Closing Entries, Introduction to Manufacnturig Account, Final Accounts of Partnership firms Admission, Retirement & Dissolution, Limited Company-Schedule VI, Amalgamation
3. **Financial Management**
   Meaning and Role (R), Working Capital Requirements, Capital Budgeting
4. **Ratio Analysis :**
   Meaning, Advantages, Limitations, Types of Ratios and Their Usefulness (R)
5. **Fund flow Statement:**
   Meaning of the Terms—Fund, Flow and Fund, Working Capital Cycle, Preparation and Interpretation of the Fund flow Statement.
6. **Costing :**
   Nature, Importance and Basic Principles (R)
7. **Introduction to Computerized Accounting System:**
   Coding, Logic and Codes Required, Master Files, Transaction Files,

Introduction to Documents Used for Data Collection, Processing of Different files and Output Obtained (R)

Main Readings:

1. Elements of Accounting Heinemann 1978-Kellock
2. Finance for the Non-Accountant 2nd Edn(R) Basic Book 1976 Rockely
3. Principles of Financial Managements, prentice-hall Integration-Lery and sarnat.

Supplementary Readings :

1. financial Accounting, Pretice—Hall International - Arnolel
2. Introduction to Fianancial Accounting- Prentice Hall International-Horngren and Sundem
3. Management Finance, 2nd Edn., Vakils Fefers & Simons Ltd., 1978-Murthy.
4. Financial Management & Policy, Prentice Inc. —Van Home, James
5. Advanced Accountancy—R.L. Gupta
6. Advanced Accounts—Shukla & Grewal

Practical-I : C Programming and DBMS (206-I)

C Programming :

1. Simple input/output programmes of intengerns, real, chnaracntern, and string (formatted and unformated)
2. Conditional statement programs (If, switch, conditional operator)
3. Looping programmes using for, while and do...while loops
4. programmes nbnased o arrays (1D and 2D)
5. Programmes using structures, unions
6. Programmes using functions
7. Programmes usingn pointers
8. File Handling

DBMS :

Assignment 1 Design a system for Hotel Management System. System provides facility for room reservation (for diffenret category rooms), and Catering service billing. Customenr's ornder for various food items are recorded during his stay at Hotel and Complete Bill (Incnluding Room Rent and Food consumed) is generated when customer checkouts.

Assignment 2 Design a Computer Terminal Booking System for booking of 5 named computer terminals for 12-hour duratio eanch dayn. User may book Terminals after entering their User ID and password and they can book a terminal for maximum 5 hour/day (in continuous slot or fragmented slots). Terminal booking chart is generatedn for each dayn for each terminal.

Assigment 3 Design a Loan Approval and Repayment System to handle Customer's Application for Loan and handle loan repayments by depositing installments and reducing balances.

Assignment 4 Design a Video Library Management System for managing issue and return of Video tapes/CDs and manage customer's queries.

Assignment 5 Design a time Management System for an Office with 10-executives who record their daily appointments in the system. When Manager wants to conduct a meeting of Exenncutives o a particular day system finds a free time slot to conduct the meeting.

Practical-II: Basic Electronics Lab (206-II)

1. Study the following devices:
   (a) Analog & digital multi-meters
   (b) Function/Signal generators
   (c) Regulated D.C. power supplies (constant, voltage and consntat current operations).
2. Study of analog CRO, measurement of time period, amplitude, frequency and phase angle using Lissajous figures.
3. Plot V-I characteristic of various diodes & study reverse Saturation current and static & dynamic resistances.
4. Application of diode as clipper and clamper.
5. Plot V-I characteristic of zener diode & study zener diode as voltage regulator. Observe the effect of load changes ad determine load limits of the voltage regulator.
6. Plot frequency respose curve for audio amplifier and to determine gain bandwidth product.
7. Plot drain current-drain voltage and drain current-gate bias characteristics of field effect transistor and measurement of I & Vp.
8. Plot gain : frequency characteristic of two stage RC coupled amplifier and calculate its bandwidth and compare it with theoretical value.

9. Plot input and output characteristics of BJT in CB, CC and Ce configurations. Find their parameters.
10. Study half wave rectifier and effenct of filter network on D.C. voltage output and ripple factor.
11. Study bridge rectifier and measure the effect of filter netwnornk on D.C. voltage output and ripple factor.

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Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week) Lect	Prac	University Theory/ Practical Duration Hrs	Marks	Internal Exam Theory/ Practical Hrs	Marks	Total Theory/ Practical
301	Data Structures	4	-	3	70	2	30	100
302	DBMS-II Using MS Access	4	-	3	70	2	30	100
303	Digital Electronics	4	-	3	70	2	30	100
304	Computer Networks	4	-	3	70	2	30	100
305	Business Systems-II (Human Resource Development)	4	-	3	70	2	30	100
306-I	Practical I (Data Structures, DBMS)		5	5	35+35 =70	3	30	100
306-II	Practical II (Digiral Electronics)		5	5	35+35 =70	3	30	100
	Total	30			490		210	700

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Paper Title : Data Structures (301)

1. **Principles Data Structures**
2. **Non-Primitive Data Strucutes.**

Arrays-its storage structures & operations
Stacks-operations and its applications in Recursio, Polish expression.
Queues- Types of queues, operationsn ad its applicatios.
Linked lists-Types of linked list, operations and its applicatios.

Trees- Concept and Definnitios, Operations, linked & threaded storage representation of Binary Trees.

Applicatios of Trees-The maninnpulnatnion of Arithemetic expressions, Symbol tale constrnuctinon, Syntax Analysis.

3. **Sorting Techniques.**
   Insenrtion Sort, Selection Sort, Merge Sort, Radix Sort, Bubble Sort, Heap Sort.
4. **Searching Techniques**
   Sequential, Binary

Main Readings :

1. An Introduction to Data Structures with applications- Trembley-McGraw Hill
2. Theory and problems of data structures-Seymour Lipshutz-McGraw Hill

Supplementary Readings:

1. Algorithms+Data Structure Programs-Wirth, Niclaus-PHI
2. Fundamentals of Data Structures, Horwitz, E., and Sahnni S. — CS Press
3. The Art of Computer Programming, Vols. 1-2, Knuth D.— Addision-Wessley.
4. Schaum's outline of Data Structures with C++, John R.H.-TMH

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Paper Title : Database Management System-II using MS Access (302)

1. **Basic Conceptsn of Database Systems**
   Purponse of Database Systems, Data Abstraction
   Data Models
   Object-Based Data Models, Record-Based Data Models, Physical Data Models Instances ad Schemas, Data Indepencdece, DDL, DML, Database Manager & Database Administrator
2. **Structure Query Language (SQL)**
3. **Integrity Constraints**
   Domain Integrity, Refnernetial Integrity, Entity Integrity
4. **Relational Databnase Design**
   Fundtional Dependencniensn
   ormalization

First Normal Form, Second Normal Form, Third Normal form, Forth Normal Form, Fifth Normaln Form.

Main Readings :

1. Database System Concepts- Henry F. Korth & Abraham Silberschatz-TMH
2. An Introduction to Database Systems- C.J. Date- Addison-Wesnley

Supplementary Readings :

1. Principnles onf Datnabnase NSystnems-Jeffery Ulnlnman-Galgotia Publication.
2. Introductio to Database Management-Navin Prakash-TMH
3. Introductio to Database System-Bipin C. Desai-Galgotia

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Semenster III

Paper Title : Digital Electronics (303)

1. **Logic gates :**
   Logic symbol, Timing Diagrams, Truth table Demorgan's first & second theorem. Interchangeability bubbled gates, universal gates.
2. **Boolean Laws & theorem:**
   Duality theorem sum of product method & equation truth table, Karnaugh map for two three & four variables & it's simplification & Nand-Nand ckts, Don't care condition, product of sum method, & it's simplification. Nor-Nor ckts. & application of duality theorem.
3. **Data Processing circuits:**
   Multiplexerns, Nibble multiplexers, Demultiplexers decoders chip expansion, BCD to Decomal decoders, seven segment decoders, seven segment decoder, decoder driver IC's Encoders, decimal to BCD decoder, parity generator & checkers & its application (ROM, PROM, EPROM)
4. **Number system & Arithmetic circuits:**
   Binary, Octal, hexadnecimal, Excess-3 code, ASCII code, grey code coversion from noe to another.
5. **Binary addition & subtraction HALF adder, full adder, adder-subtractor circuits**
6. **TTL & CMOS circuits:**

Power Dissipation, Propagation delay time, TTL ckts., twoi/p TTL NAND gate, Invertenr gate, NOR gate, Three state TTL devices, Schmitt Triggers, siking ad sousing, Loadings, noise immunity Positive and negative logic CMOS ckts, CMOS Inverter, CMOS NAND, NOR gate.

7. **FLIP FLOPS**

Costruction of flip flop usig differet gates, RS flip flops, D flip flop, Edge triggered D flip flop, clocked RS flip flop, switching time, JK flip flop, JK master slave flip flop, Schmitt trigger,

8. **Shift Registers:**

Types of Registers, Serial in Serial out, Serial in Parallel out, Parallel in Serial out, Parallel in Parallel out, Ring counter, Asynchronous counter 4, binry up-down counter, Decoding gate, Synchronous counter, Mode 8 Parallel binary counter & up down counter, Parallel up downm counter, Mod-3 counter, Mod-6 counters, Mod-5 counters & C Decade counter, shift counters, Digital clock.

9. **D/A & A/D conversion**

Variable Resistor Network, Binary Ladder, 4 bit D/A converter, dual slope A/D conversion

Main Readings:

Digital Principles and Application : TATA McGraw-Hill Edition by Albert Paul Malvino, Donald P. Leach.

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Paper Title : Computer Networks (304)

1. **Introduction to Networks**

Data communication and Networking-Concepts, Need, Uses and Advantages of Network, Networks in workplace, Client, Servers and Peers based and Hybrid Networks, Server Types Network Topologies, IEEE 802 standards, Transmission Media, Network Protocols

2. **The OSI Mode**

Layer Architecture, Introduction to OSI Model. The OSI Model Layer Functions

3. **Major Protocol Suits :** Review of Protocols, Models and Implementations, Internet Protocols.

4. **Network Hardware**
   Cable Types, Considerations, Ethenet Cable types and their Applications, Installing and Configuring Netwonrkn Cards, Repeaternsn, Hubns, Switches Routers, Gateways
5. **Network Soitware**
   Features cf Network Operating Systems, Popular network Operating Systems (Client and Server)
6. **Principles of Network Design**
   Defining Enterprises Network Application Clients, Back Office and off-the-self Server Applications, Evaluating Current Network Environment, Assessing Network Services, Analyzing Technical Support Structure, Analyzing the Current network Management.
7. **Network Configuration**
   Reviewing Network Protocols, Understanding Network Drivenrs, Services, Redirectors, Multiple Transport Stack, network Binding Interfaces, Installing and Configuring Network Adapters, Protocols (TCP/IP & Net BEUI). Managing Network Binding, Sharing Files and Printers.
8. **Network Administration**
   User Profiles, Folder Security, Account Policies, Trust relationship between Domains, Computer management, Workstation Management
9. **Building Intenret and Intranet Infranstructure**
   Elements of TCP/IP Network, Designing Nentnwork and IP Address scheme and Assigning IP Addresses, Routing Issues, Configuring and Testing and NOS.
10. **Network Security**
    Various Types of Security, Security with Certificates, Planning A Security Approach, Security Problems and their consequences, Introduction to Firewalls

Main Readings:

1. Networkning Complete-3rd Edition, BPB Publications.
2. Mastering Local Area Networks by Christa Anderson & Mark Minaski-BPB

Supplementary Readings:

1. MCSE : Networking Essentials Study Guide, Tata McGraw Hill Pubnlicatios

2. MCSE : Windows 2000 Network Infrastructure Design Study guide, Tata McGraw Hill Pub.
3. Computer Networks Byu A.S. Tanenbaum, PHI Publications.

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Paper Title : Business System—II (Human Resource Development) (305)

1. **Importance of Human Factor**
   Characteristics of HRD—Objective and Need for HRD—Difference between personnel Management and HRD—HRD Process-HRD Methods and mechanism-Outcomes of HRD
2. **Planning the HRD System**
   nNObjectives and Importance of manpower Planning - Techniques of Manpower Planning- Process of manpower Planning.
4. **Recruitment**
   Sources of Recruitment-Selection-Selection Process-Placement and Induction.
5. **Concept of Training and Development**
   Objectives and Importance of Training and Development - Identification of Trnaiing Neneds-Planing and Designing T & D Programmers- Raining Methods - Factors affecting in selection of Training methods- Evaluation of Training and development.
6. **Concept of Performance Appraisal**
   Objectives and Importance of Performance Appraisal- Process of Performance Appraisal Methods of Performance Appraisal-Limitation of Performance Appraisal.
7. **Concept of Career**
   Career Stages-Concept of career Planning-Career Planning Procenss-Career Development Individual Development and Organizational development.
8. **Application of Information System in HRD**
   Personnel Application-Salary administration-Time Keeping Management-Skill Inventory - Medical History- Accident Monitoring-Performance Appraisal-Training and Development-Manpower Planning-Recruitment-Career Planning.
9. **Business Ethics and Morals**
   Business ethics-their relevance and requirement; Corporate gov-

ernance; E-governance in business; transparency and secrecy issue.

Main Readings:

1. Human Resource Development; P.C. Tripath : Sage Publication, New Delhi.

Supplementary Readings :

1. Designing & Monitoring HRD System : Dr. T.V. Rao
2. HRD Policies : As Simulation & Implications : B.S. Bhatia.
3. HRD In New Economic environment : D. M. Silvenia & T.V. Rao.

Practical-I : Data structure and DBMS (306-I)

Data structure :

1. Simple array and simple sorting.
2. Addition multiplication adn trnaspose of sparse matrices represented in linked list form.
3. Polynomial addition, multiplication (8th degree polynomials).
4. Imnplementation of stack and que using array and linked lists.
5. Implementation of circular que using linked list.
6. Infix to postfix/nprefix conversion.
7. Quick sort, merge sort and searching algorithms (fibonacci search).
8. Binary tree traversals.
9. Generation of spanning trees for a given graph using bfs and dfs algorithms.
10. AVL tree implementation (crenatio, insertionn, deletion).
11. Symbol table organization (Hash Table).

DBMS :

1. Study of Microsoft Access 97
2. Designing tables using different methods- design view, wizard, etc.
3. Designing queries using different methods- SQL window, design view, wizards
4. Designing input forms using different methods-design view, wizards.
5. Creating reports for management.

Practical-II: Digital Electronics Lab (306-II)

Practical-II: Digital Electronics (306-II)

1. Study of AND, OR, NOT gates.

2. Study of NAND and NOR universal gates.
3. Study of EXOR gates using NAND and NOR.
4. Study onf De Morgan theorems.
5. Study of timer 555 oscillator.
6. Study of frequency divider using IC 7490.
7. Study of latch switch using IC 7400.
8. Study of ADC and DAC circuits.
9. Study of half adder and full adder circuit.
10. Study of up and down counter.
11. Study of seven segment display.
12. Study of BCD conversion.
13. Study of RC circuit with DC and AC voltages.
14. To study the characteristics of various types of flip-flops such as D type, JK flip-flops etc.
15. Study of decoder, multiplexer circuits.

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Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
401	VDAT-I	4	-	3	70	2	30	100
402	Object Oriented Programming	4	-	3	70	2	30	100
403	Microprocessor & Assembly Language	4	-	3	70	2	30	100
404	WADT-I	4	-	3	70	2	30	100
405	E-Business	4	-	3	70	2	30	100
406-I	Practical I (VB 6.0 and Web Development		6	5	35+35 =70	3	30	100
406-II	Practical II (OOP)		4	5	35+35 =70	3	30	100
	Total	30			490		210	700

VADT—Visual Application Development Techniques.
WADT-Web Application Development Techniques.

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Paper Title :Visual Application Development Techniques using Visual Basic 6.0 (401)

1. **Using Visual Basic Default Controls**
   Text Boxes, Label Control, Check Boxes, Option Buttons, Picture Boxes and Image Controls, List Controls.
2. **Visual Basic Language**
   Variables, Constants, Array, Collections, Functions, Flow Control Statements, Loop Statements.
3. **Forms**
4. **Menus & Toolbars**
5. **Database Programming**
6. **Dialog Boxes**
   Message Boxes, Input Boxes, Common Dialogs
7. **Report Generation**
8. **User Defined Controls**

Main Readings :

1. Beginning VB 6—Peter Wright - Wrox

Supplementary Readings :

1. Peter Norton's Guide to VB 6—Peter Norton-SAMS
2. VB 6 How to program—Deitel & TR Nieto-Pearson
3. VB 6 Unleashed —Rob—SAMS

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Paper Title : Object Oriented Programming Through C++ (402)

1. **Pointers and Self Referential Structures**
2. **Principles of Object Oriented Programming**
   Procedure Oriented Programming Vs Object Oriented Programming
   Basic Concepts of Object Oriented Programming (Encapsulation, Polymorphism etc.), Benefits of Object Oriented Programming.
3. **Classes & Objects**
4. **Constructors & Destructors**

5. **Operators Overloading, Functional Overloading & Type Conversion**
6. **Inheritance**
7. **Dynamic Polymorphism**
8. **Data Files**

Main Readings :

1. Object Oriented Programming with C++ : Balaguruswami.
2. OOP in Turbo C++ : Robert Lafore: Galgotia Publication.
3. Mastering C++.: Venugopaln

Supplementary Readings:

1. Object Oriented Programming Fundamentals & Application : Probal Sengupta: PHI
2. The C++ Programming Language : Stropstrup : Addison Wesley

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Paper Title : Microprocessor & Assembly Language (403)

1. **Introduction to Microprocessors.**
   Typical Requirements of Architecture : Batch Processing, Multiprogramming, Time sharing & Multitasking Systems; Intel 8086 architecture, Internal Operation, Addressing Modes, Intel 8086 Configurations—Minimum Mode and brief introduction of Maximum Mode, Intel 8086 System Connections, System Bus Timing.
2. **Intel 8086 Family assembly Language Programming**
   Program Development Stage, Programming with the use of Assembler and other Development Tools like Loader, Compiler, Locator, Debugger, Assemble Instruction Format, Practice with Simple sequence Programs, Flags, Jumps, etc., Implementation of Decision making, Multiple Branching and Iterative Looping Controls with Assembly Language instructions, String Instructions, Stack manipulation, Writing & Using Procedures, Macros & Debugging of Assembly Language Programs, Assembly Directives. Use of DOS/BIOS interrupts, Using C with Assembly language Programming.
3. **Programmable Peripherals Devices**
   Memory and I/O Addressing for Microcomputer Systems, Overview of Intel 8255 Programmable Peripheral Interface, Program-

mable Timer/Counter & Clock Generator-INTEL's 8253/8254 Programmable keyboard/Display 8279, Programmable Interrupt-IC 8237

4. **Interrupts management**
   Intel 8086 Interrupts, IVT, acknowledgement cycle, typical 8086 response, Different types of Interrupts, Interrupt Service Routines, TDR's, Block transfers and Interfacing DMAC-IC 8237.
5. **Advanced Microprocessors**
   Overview of 80286, 80386, 80486 Pentium Architectures.
6. **Bus Standards**
   Overview study of the PC, PC-AT, ISA, EISA, IEEE-488 Bus, IDE, EIDE, SCSI, VESA, PCI, PC Card (PC MCIA) Bus.

Main Readings:

1. Microprocessor & Interfacing: Douglas Hall, McGraw Hill
2. 8086/8088 family architecture, programming & design: Yu Chang Lin & Bibson, PHI
3. Programming & Interfacing, J Uffenbech, PHI

Supplementary Readings:

1. Advance MS-DOS Programming- Ray Duncan
2. The Intel Microprocessors — Fourth Edition—Barry B. Brey-PHI
3. IBM PC and its Clones : Goving Rajalu : TMH Publication, 1994.

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Paper Title : Web Application Development Techniques-I (404)

1. **Introduction WWW and Internet**
   World Wide Web consortium, W3C Charter and its work, Web Hosting
   Internet Domains, Internet Servers, IP addressing
   Web Server and Web Browsers
2. **Introduction to HTML**
   HTML Structure
   Document Head, Document body, Title and Footer.
3. **Text Formatting**
   Paragraph breaks, Line braks, Bold, Italics, Underline, Spacing Heading style, Line breaks

4. **Links**
   External, Internal, Image as Hyperlink, Image Maps
5. **Tables**
   Header, Data rows and Caption, Width and Bordenr, CENLLPADDING, CELLSPACING, BGCOLOR, COLSPAN, ROWSPAN
6. **Froms**
   Text, Button, Radio, Checkbox, Password, Hidden, Button, Textarea, Label, Submit and Reset, Tab Navigation, Access Keys
7. **Frames**
   FRAMESET, FRAME, Targeting named frames, Communicating Between Frames, Inline frames
8. **Embedding Object**
   OBJECT tag, Adding dynamic content with OBJECT
9. **Cascading Style Sheet (CSS)**
   Style Sheet types, Linked, Embedded, Inline, Style Sheet Precedence,
   Style Sheet Syntax, using Classes, using Media Types, Font Control.
   Text Control, Color and Backgroud, List Box Control, Miscellaneous
   Properties, Defining Aural Style Sheets, Controlling Position with CSS, Box Model, Margin and Padding Properties, border Properties, Tables, Absolute versus Relative Properties, Pages Media.
10. **Layering**
    Controlling visibility and Stacking order, Z-index property, Visibility property
11. **HTML Editors (Front Page, Visual Interdev)**
12. **Flash**
    Flash Interface, Menus and Settings, Drawing and Paintig, Creating and using symbols, Text Layers, Timeliness, Graphics, Animation and Sound Exporting and Publishig Movies.

Main Readings:

1. The Complete reference HTML-thomas-TMH
2. HTML 4 Unleashed - Rick-SAMS
3. Flash 5 Bible-Robert-IDG

Supplementary Readings:

1. Microsoft Frontpage 2000—T.J.O. Leary-TMH
2. Microsoft Frontpage 2000 24 Hours—Roger C. - Techmedia
3. HTML 4- Rick- SAMS
4. Web Publishing with HTML 4 in 21 days—Laura—SAMS

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Paper Title : E-Business (405)

1. **Information Technology and Business**
   Introduction, The customer driven supply chain, Information Age, Origins of the Intenret, The evolution of Interet; The spread of Iternet, Definition of Intenret. The underlying network and its goals, Internet today, Electronic Commerce.
2. **Fundamentals of E-Commerce**
   Introduction, Objectives
   Commerce-The Traditional way
   The buyer, The Seller
   History of Electronic commerce, Definition of Electronic Commerce,
   Comnpariso between Traditional Commerce and E-Commerce, The Technologies of E-Commerce, Advantages of E-Commerce, Disadvantages of E-Commerce,
   International Electronic commerce,
   Infrastructural requirements of E-Commerce
   Technology Overview, Packet switched networks, The TCP/IP Intenret
   Protnocoln, Internets, Intranets ad Extranets
3. **Types of E-Commerce**
   Introduction, Objectives, Types of Business Transactions, Business to Customer, Customer to Customer, Business to Business
4. **Security of E-Commerce**
   Introduction, Learning Objectives, Security Overview, Computer Security
   Classification, Copyrights and Intellectual Property
   Electroic Commerce Threats
   Communicatio Channel Threats, Secrecy Threats, Integrity Threats.

Necessity Threats, Server Threats, Web Server Threats, Database Threats, common Gateway Interfacne Threats, Other Programming Threats.

5. **Security Concerns**
Introduction, Objectives, Security concerns, Combating E-commerce Threats, Protecting Intellectual Property, Protecting Client Computers, Digital Certificate, Dealing with Cookies, using Antivirus Software, Protecting Electronic, Commerce Channel, Providing Transaction Privacy, Encryption, Data Encryption Standard (DES), Comparison between Public key and Private key encryption methods, Secure E-Commerce, Secure Sockets layer protocol, Secure HTTP (S-HTTP) protocol, Ensuring Transaction Integrity, Guaranteeing Transaction Delivery.

6. **E-Transactions**
Introduction, Objectives, the basics, Credits and Charge cards, Open and Closed loop Systems, Merchant Account, Secure Electroninc Trnansanction (SET) Protocol, Dual Signature Scheme, Electronic Cheque Payment, Electronic Cash, Holding electronic Cash, Advantages and Disadvatages of Electronic Cash, How does Electnroic Cash Work, Security for Electronic Cash, Electronic Wallets, Smart Cards, Micro-Payment for Information Goods.

7. **Implementing an E-Commerce Site**
Introduction, Objectives, Web presence goals, Achieving Web presencne goals How the Web is different, Meeting the needs of Web site visitors, usability
Testing
Identifying and Reaching customers
Communicatio on the Web's new marketing approaches.
Technology-eabled Relationship management
Creating and maintaining Brands on the Web
Elements of Branding, Rational Branding vs. Emotional Branding

8. **Introduction to E-governance** and it's applications.

Main Readings:

1. Frontiers of Electronics Commerce: Kalakota and Whinston: Addison Wesley

2. Electronic Commerce: A Mangerial Perspective : Efraim Turban, Jae Lee, David King, H. Michel Chung : Pearson Education Asia

Supplementary Readings:

1. IT Encyclopaedia.com : Volume 8: Parag Diwan & Sunil Sharma: E-Commerce Pentagon Press
2. E-Commerce Strategies : Charles Trepper: PHI

Practical-I : visual Basic Programming & Web Designing Lab (406-I) VB:

1. Designing simple application using forms, text boxes etc.
2. Limiting output- using check boxes, radio buttons, lists, combo etc.
3. Taking decisions- if else, if, select case, etc,
4. Looping- for next, while, do while, for each, etc
5. Control arrays-loading controls at runtime
6. Giving users more functionality-menus and toolbars
7. Connecting to VB 6.0 sample database-Nwind.mdb-DAO control
8. Altering contents of database using OLEDB-ADODB and ADODC
9. Data environment and data reports
10. Active X controls-creating custom controls

Web Designing:

1. Designing web pages-using various tags for font, bold, italics, address, paragraph formatting-aligning, line spacing, orientation, etc
2. Embedding images and other objects
3. Linking documents-hyper links to other pages, images, files, etc
4. Using images as links-image maps
5. Frames-navigation bar as in windows explorer with help of hyper links
6. Embedding objects-a calculator control designed using VB6 to be embedded in a web page.
7. Advanced formatting of pages-controlling visibility, order, and positioning using CSS.

Practical-II: Object Oriented Programming Lab (406-II)

1. Introduction Input/output C++ Style
2. Introduction to Classes and objects

3. Problems involving Constructors and destructors
4. Problems involving inhenritance and member access-public and private members
5. Problems involving friend functions and friend classes
6. Problems involving Multiple inheritance
7. Problems involving operator overloading and function overloading
8. Problems involving run time polymorphism-late binding
9. File handling in C++

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Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week) Lect	Prac	University Theory/ Practical Duration Hrs	Marks	Internal Exam Theory/ Practical Hrs	Marks	Total Theory/ Practical
501	VDAT-II	4	-	3	70	2	30	100
502	RDBMS using Oracle 8i	4	-	3	70	2	30	100
503	Computer Graphics & Animation	4	-	3	70	2	30	100
504	System Analysis & Design	3	-	3	70	2	30	100
505	E-Business	3	-	3	70	2	30	100
506-I	Practical (VC++ and Computer Graphics)		6	5	35+35 =70	3	30	100
506-II	Practical II (SAD and RDBMS using Oracle 8i)		6	5	35+35 =70	3	30	100
	Total	30			490		210	700

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Paper Title : Visual Application Development Technique-II (501)

1. **Introducing Visual C++ 6**
   Functions, Structures, Classes
2. **Dialog Boxes and Basic Controls**

Dialog Boxes, Button Controls, Edit Controls, List Box and Combo box Controls.

3. **Windows and MFC Architecture**
   Messages and Event Driven Programming, The document/View Architecture
4. **Menus**
5. **The Graphics Interface**
   Device contexts, Using Pens and Brushes, Fonts, Icons and Cursors
6. **Active X**
   Active X control fundamentals, Active X Control Properties, Active X Control methods, Active X control Events.

Main Readings:

1. Mastering Visual C++ 6-Michael J. Young - Sybex
2. VC++ Programming-Kanitkar

Supplementary Readings:

1. VC++, COM and Beyong- Yeshavant Kanetkar & Sudesh Saoji-BPB2. Developing
2. VC++ Gems-Kanitkar
3. Active X Components with Visual Basic 5.0-Dan Appleman-Techmedia
4. Teach Yourself Visual C++ 6 in 24 Hours-Micky Williams-Techmedia
5. Teach Yourself Visual C++ 6 in 21 Hours-Chappay-Techmedia.

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Semenster V

Paper Title : RDBMS (502)

1. **Client/Server Computing Model**
2. **Overview of Oracle Architecture**
3. **Tables, Indexes, Constraints & Views**
4. **Privileges**
   Object Privileges, System Privileges
5. **Transaction Control**
   Commit, Savepoint, Rollback
6. **Built-in SQL Functions**
   Character, Numeric, Date & Time, Conversion, Aggregate and Analytic

7. **PL/SQL**
   The PL/SQL
   Lexical Units
   Identifiers, Delimiters, Literals, Comments
   Variables, PI/SQL Types, Expression & Operators, Control Structure Records
8. **Cursors**
   Explicit & Implicit Cursors, cursors Loops, Cursor Variables
9. **Procedures & Functions**
   Subprogram Creation, Parameter Modes, Procedure Versus Funmctions
10. **Packages**
    Package Specification, Package Body, Packages and Scope
11. **Database Triggers**
    Types of Triggers, Creating Triggers
12. **Error Handling**
    Declaring Exception, Raising Exception, Handling Exception, Exception Propagation, Scope of Exception
13. **Sequence & Pseud columns**
    CURRVAL & NEXTVNAL, LEVEL, ROWID, ROWUM
14. **Object Relational Database**
    Object Types, Object Tables, Nested Tables, VARRAY
15. **SQL *Plus**
    Using SQL* Plus for Editing Using SQL* Plus to Work with files, Using SQL* Plus for Formatting Output, Using SQL* Plus Variables.

Main Readigs:

1. Oracle 8i The Complete refernece—Oracle press—Georgne Koch
2. Ornacle 8i How to - Techmedia

Supplementary Readings:

1. Onracle n9i PL/SQL Programming-Scott Urman-Oracle Press-TMH
2. Oracle 9i DBA Handbook-Kevin Loney-Oracle Press-TMH
3. Oracle9i Web Development-Breadley-Oracle Press-TMH

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster V

Paper Title : Computer Graphic & Animation (503)

1. **Geometry & Line Generation**
   Geometry, Pixel & Frame Buffer.
   Vector Generation: VECGEN & VRASENHAM Algorithm
   Character Generation, Circle Drawing
2. **Graphics Primitives**
   Display Devices
   Line & Point Piotting nSynstemns,n Raster, Pixel & Point Plotters, Continual refresh & storage displays, Plasma Panel displays etc.
   Primitive operatios
   Text
3. **Polygons**
   Polygon & its represetation
   Inside test : Even odd and Winding number method
   Filling polygons
   Flood & Scan line fill
   Filling with a pattern
4. **Transnformation**
   Introduction to Matrices
   Transformation
   Scaling Transformation, Rotation, Translation, Rotation about Arbitrary Point, Inversnne ad other Transformation.
5. **Segments**
   Introduction to segments table, Various operations on segments
6. **Widowing & Clipping**
   Windowing, The viewing transformation, Multiple windowing Clipping
   Cohen-Sutherland outcode Algorithm
   Sutherland - Hodgman Algorithm
   Generalized Clippint
7. **Three Dimensions**
   Geometry of 3D, 3D primitives & Transformations, Projection Windowing Clippint
8. **Advance Graphics Techniques & Tools**

Main Readings:

1. Computer Graphics: Programming Approach- Harrington S. - Tata McGraw Hill
2. Interactive Computer Graphics-Giloi W.K. - PHI

3. Principles of Interactive Computer Graphics-Newman W. & Sproul P.F. - McGraw Hill

Supplementary Reading:

1. Produral Elements for Computer Graphics-Rogers D.F.-McGraw Hill
2. Fundamentals of Interactive Computer Graphic–Foley J.D., Vandam A,–Addison Wesley.
3. Computer Graphic–Hearn D., Baker P.M.–Prentice Hall.

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster V

Paper Title : System Analysis & Design (504)

1. **Introduction to Information systems development**
   System Analysis & Design: An Overview, System Analyst & Users: Responsibilities, Business Information Systems: Categories, Software characteristics problem characteristics problem with the software development, software development process Models
   Waterfall model
   Prototyping
   Evolutionary Software Process Model
   Incremental Model, Spiral Model
2. **Requirement Analysis & Specifications**
   Fact Finding Techniques, Structured Analysis: Tools & Techniques, Data Flow Diagrams, E-R Diagrams, Data Dictionary, Characteristics, Components of Requirement specification Software Requirement Specification (SRS) Document
3. **System Design**
   Testing Fundamentals, Functional Testing, Structural Testing, Testing Process
4. **Testing & Implementation**
   Testingn Fundamentals, Functional Testing, Structural Testing, Testing Process

Main Readings:

1. Software Engineering A Practitioner's approach-Roger S Pressman-McGraw Hill
2. An Itegrated Approach to Software Engineering - Pankaj Jalote-

Narosa Publication

Supplementary Readings:

1. Analysis and Design of Information Systems-James A Senn-McGraw Hill
2. System Analysis & Design-Elias M Awad - Galgotia Publication, 1997
3. Elements of System Analysis-Marvin Gore-Galgotia Publication

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster V

Paper Title : Operating Systems (505)

1. **Operating Systems Concepts**
   Evolution of Operating System & History Needs of an Operatig System, Single User & Multi-user Operating Systems, Elements of an Operating System, Operating System as a Resource Manager
2. **Process Management**
   Process management functions, Process concept, Scheduling
   Scheduling algorithms
   Process coordination
   Producer/Consumer problem, Critical Section problemn, Semphores,
   Language Constructs, Interprocess Communication, Deadlocks
3. **Memory Management**
   Memory Management Functions
   Contiguous allocation
   Partitioned memory static & dynamic allocation, Segmentation
   Non-contiguous allocation
   Paging, Demand paging & Segmentation, Allocation & Replacement policies
4. **File Management**
   File management functions, File system & Directory structure organization,
   File protection
5. **Device Management**
   Device management functions, Device characteristics, Disc space Management Allocation & Disc Scheduling Methods

BIOS, POST Operation, Vector Table, Device Drivers, TSR Programs, System Files, Configuration Files, Commands

7. **Multi-user Operating Systems**
   Introduction to Windows-NT, UNIX, Windows-2000
   Basic Comands of NETWARE, Windows-NT, Windows-2000
   Comparative studies

Main Readings:

1. Operating Systems Concepts - Galvin Silberschatz - McGraw Hill
2. Operating Systems - Stallings - PHI

Supplementary Readings:

1. Advanced MSDOS -Ray Duncon -McGraw Hill
2. Advanced Unix-A Programmer's Guide -Stephen Prata SAMS
3. User Manual of DOS, Windows -Windows-Nt -Netware
4. Unix Concepts and Application - Das -McGraw Hill

Practical-I: VC++ and Computer Graphics (506-I)

VC++ Programming:

1. Introductinon to Visual programming with VC++
2. Creating forms, text boxes. and other visual elements.
3. Accessing the Windows API for system calls and registry manipulation
4. Attaching methods and properties. Providing and handling events
5. Reusing the components-Using MFC
6. Creating Menus with slidig and trnansition effects
7. Visual arena-fonts, strokes, cursors, etc
8. Creating custom controls Active X

Computer Graphics:

1. Implementing Line drawing algorithms-DDA and Bresenham's in VC++/C++
2. Drawing shapes with regular sides
3. Creating menu system
4. Plotting graphs using user input/file data
5. Drawing circles/ovals using mid-square algorithm
6. Area fill algorithms-flood-fill and scan-fill.
7. Using clipping and windowing algorithms

Practical-II: SAD and RDBMS using Oracle 8i (506-II)

SAD Programming (Case studies may be carried out):

1. Analyze and study a hotel chain having three hotels in a tourist city - one a three star, anonther a five star, and last one a heritage hotel. You are required to prepare a case study for integration of management of all three of them so that the management is in a position to offer its clients any of the options as per their needs and budget. This will involve complete automation of the registration, booking and querying processes of the chain.
2. The Government Hospital in your city wants to overhauls its store and supplies. It has been found that due to lack of proper procefures and untimely infnormatinonn certain materials are bought and stored in quantities more that required and some materials in need are not even timely ordered. Suggest a solution to overcome this problem.
3. The bank in your locality is currently maintaining its records in paper. Prepare an automation plan for the bank.

RDBMS using Oracle 8i

1. Connecting to database and running simple select queries
2. Queries on Where, Group By, Aggregate functions, Joins, etc
3. Data Manipulation queries-Insert into, Delete, Update
4. Data Definition queries-Create, Drop, Alter- tables, views, sequences
5. Using SQL *Plus-spooling, editing, environment settings
6. PL/SQL programming - writing scripts and executing them
7. Procedures-Annonymous scripts,on Stored Procedures, Triggers, etc

M.Sc. [Five Year Integrated Course]
B.SC. (Information Technology)
Semenster III
Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
601	Web Programming	4	-	3	70	2	30	100

602	Unix & Shell Programming	4	-	3	70	2	30	100
603	Database Administration	4	-	3	70	2	30	100
604	Numerical Analysis	4	-	3	70	2	30	100
605	Project	-	4	5	100			100
606-I	Practical I (Web Programming and DBA)		5	5	35+35 =70	3	30	100
606-II	Practical II (USP and NA)		5	5	35+35 =70	3	30	100
	Total	30			520		180	700

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Semenster VI

Paper Title : Web Programming (601)

1. **Introduction to Java Script**
2. **JavaScript Basics**
   Data Ypes, Variable, Array, Expression
   Functions- Built-in functions, User defined functions
   Flow Control Structures
   Objects
3. **Document Object Model (DOM)**
   HTML Object, Collections, Elements, Window Objects, Document Objects, Text Range Objects
4. **Event Handling**
   Events, Event firing, Event handlers, Binding to events, The window event object, Overriding default events
5. **Java Script and Cookies**
   Session Cookies, Persistent Cookies
6. **Java & the Internet**
   Brief introduction to Internet, An introduction to Janva phenomenon.
7. **Java Phenomenon**
   Java & Hot Java, Java Scripts, Features of Java
8. **JDK and Use**
   Java Compiler, Java Interpreter, Java debugger, Applet Viewer, Java Disassembler

9. Java Language

Syntax, Comparative study with other OPP Lang (C++)

10. Class & Object

java classes, Java Interfaces

11. Programming the Web with Applet & Scripts

Developing Applets, Integrating Applets into distributed Applications, Working with Java Script

Main Readings:

1. HTML 4- Second Edition- Rick Darnell-Techmedia
2. Netscape Java Script 1.2 - Kent & Kent- Comdex

Supplementary Readings:

1. Using HTML 4, XML and Java 1.2 PHI
2. Partrick Naughton: Java - The complete Reference- TMH
3. C. Thomas: Introduction to Object Oriented Programming With Java-TMH

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster VI

Paper Title : Unix & Shell Programming (602)

1. Overview of UNIX

Architecture

Kernel

Process, Rebuilding Kernel

Shell

Features, Different type of Shells and their comparison, Command interpretation by shell, Interpretation by shell, Initialization (i.e., Login) scripts

Booting Process

Boot sequence, Boot Scripts, Init process, System Profiles, Booting multiple OS

2. Getting started

Login process, Login shell, User profiles and its customization, Understanding unix command structure, Elementary commands like pwd, who, passwd, man, tty etc., Editor

3. UNIX services

File Management

Different type of files, File system structure, Path-Absolute and Relative File and Directory permissions, File and directory stor-

age strategies (i.e. structure), Commands related to file management like ls, rm, cat, cp, mv, touch, mkdir, rmdir, wc, chmod, chown, chgrp, ln, pg, more, cmp, diff, head, tail, sort, uniq.

Process Management

Process and PCB, Scheduling algorithm, Process status, Background and Foreground Process, Signals, Process synchronization, Commands related to process management like ps, kill, trap, nice, batch, at, cron.

Memory and Device Management

Memory management schemes, Shared memory, Memory protection, Overview of device management, Device classification including minor device number, Device drivers

4. **Shell Programming-I**

   Variable-User ad system, Assignment statement, I/O statements, Escaping, Quoting, Redirection, Pipe, Command substitution, Command grouping, Shell script, different ways of executing scripts, Commands like cut, paste, set, unset

5. **Shell Programming-II**

   Positional parameters and other like $@, $*, $#, $? Etc., Coditional execution (& & and ||), Operators-arithmetic, relational, logical, file related, string related, Arithmetic manipulation expr, let (if available in default shell), String manipulation-expr, Statements like if, case, while, until, for, test command, Exporting shell variables, Array (if available in default shell), Functions, Commands like eval, exec, trap

6. **Filtering utilities**

   grep, grep and fgrep, sed, awk/nawk, gawk (which ever available)

Main Readings:

1. Your UNIX the ultimate Guide - S. Das-TMH
2. Operating System - Stallings PHI

Supplementary Readings:

1. The design of the UNIX operating system- M.J. Bash-PHI
2. The complete reference Linux- Richard Peterson-TMH
3. Unix for Super User-Addison Wesly
4. The UNIX Programming Env.-Kernigh & Pike- PHI
5. C & UNIX Programming-N Kutti
6. Working with UNIX-Jijay Mukhi-BPB

UNIX Shells - Bourn, Korn & C- Vijay Mukhi- BPB

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster VI

Title : Database Administration (603)

Oracle Databnase Architecture

Oracle Tools and Utilities

SQL *PLUS, SQL *DBA, SQL *LOADER, Import & Export

Database Administration

Managing the Database

Parameter File, Oracle SID, Creating the New Database, Startup and Shutdown,

Data Dictionary, redo Logs, Trace and Alert Files, Database Modes, Useful

Data Dictionary Modes

Managing Disk Space

Blocks in Database File, Segments and Extents, ROWID, Storage Clause,

Rollback Segments, Table Space

Managing Users

User Authentication Methods, User Configuration Setup, Resource

Management, Working with User's Database Account

Backup and Recovery

Types of Backup, Table Space Offine Copy, Types of Database Failures

Recovery methods

Database Security

Authentication

Privileged Accounts

System Security

Operating System Security, Password Management, Preventing Password Reuse, Setting Password complexity

Database Roles

Creating Roles, Grant Roles to users

Database Auditing

Enable Database Audit, View Audit Information, Delete Audit Information

Object Security

4. **Creating Database**
   Oracle Database Copnfiguration Assistnant, Manually Creating Database
5. **Oracle Net**
   Overview of Oracle Net, Oracle Net Configuration Assistant, Oracle Net Manager
6. **SQL Statement Tuning**

Main Readings:

1. Oracle 9i DBA HandBook-Kevin Loney-Oracle Press-TMH
2. Oracle Database Administration-The Essential Reference- David & Brian-O' Reilly

Supplementary Readings:

1. Oracle Performance Tuning-Oracle Press-Richard
2. ORACLE SQL and PL/SQL Annotated Archives-Kevin Loney
3. ORACLE Secutiry-marlene Theriault W. Heney
4. ORACLE Database Administration-David C. Kreines B. Laskey
5. Oracle9i Web Development - Freadley-Oracle Press-TMH

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster VI

Paper Title : Numerical Analysis (604)

Numerical Analysis

Computer Arithmetic: Floating point numbers - Operations, Normalizations and their consequences.

Iterative Methods : Zeros of single transncedental equations and zeros of polynomials using, Bisection, False position, Newton Rephson etc., convergence of solution.

Simultaneous Linear Equations: Linear equations solutions of simultaneous linear equations - Gauses eliminations method and pivoting; III conditioned equations and refinement of solutions, Gauses Seidal Iterative method.

Numerical Differentiation and Integration. Solution of Dinfferential equation: Range Cutta methods; Predictor-Corrector methods, Automatic error monitoring stability of solutions.

Interpolations and Approximation: Polynomial interpolation Newton, Language etc. Difference tables. Approximation of function by Tavlor series and Chebychew polynomials.

Main Books:

1. Stoer, Bullrich: Computer oriented numerical Methods, Springer Verlag, 1980.
2. Rajaraman V: Computer Oriented Numerical Methods, PHI, 1980.
3. Krishnamurthy E. V., Sen S.K. : Computer Based Numerical Algo-rithms, East-West Press J984.

M.Sc. (I.T.) [Five Year Integrated Course]
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Semenster VI

Paper Title : Project. (605)

The students are required to carry out project work for part time during the semester based upon the knowledge gained so far in the course. The project will require the students to interact with the industry and clients. The final presentation will ben held in the presennce of the external examiner as designated by the University of Rajasthan, and marks will be awarded based on both the presentation and project report.

Practical-I : Web Programming and DBA Lab (606-I)

Web:

1. Adding life to web pages-using scripting (Java Script) to add animatinnon
2. Verifying user innput and validating forms
3. Embedding Java Applets and taking user input through them
4. Connecting to Java based web server (JSP) and loading dynamic web pages.

DBA

1. introduction to need and usage of various tools available with Oracle 8i
2. Creating table-space, rollback segments, etc for the users of data bases.
3. Creating segments and extents-for user data and system data
4. Creating users and roles-granting and revoking privileges
5. Providing for security-Password complexity, setting various roles, OS dependability
6. Net 8 Manager and Nent 8 Clients-Connecting to remote database serverns

7. Performance tuning

Practical-II: Unix and shell programming, Numerical analysis Lab (606-II)

USP:

1. Introduction to various Unix shell commands.
2. Script to create directory in usr directory and make a file that will have listing of all files in a particular directory.
3. Write shell script to print file names one per line in the directory (Path supplied at command line) showing serial number on each line.
4. Write script to count the no of words, characters, white spaces, and lines in the input. The input can be from console or from a file.
5. Modify the call command to accept more than one month as input

Numerical Analysis:

1. Implement a program in C or C++ to show various rounding errors in computations using a computer
2. Solution by convergnece-Implementation of Bisection and Newton Raphson methods for solving equations
3. Solving simultaneous linear equations using Gaussian eliminationn method
4. Solving simultaneous linenar equations using Gauss-Seidal method
5. Numerical differentiation and integration.

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Semenster VII
Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
701	APE-I	6	-	3	70	2	30	100
702	APE-II	6	-	3	70	2	30	100
703	Software Engineering	3	-	3	70	2	30	100

704	Operation Research	3	-	3	70	2	30	100
705-I	Practical-I (NET Framework and C#)	-	6	6	35+35 =70	4	30	100
705-II	Practical-II (VB. NET and ASP. NET)	-	6	6	35+35 =70	4	30	100
	Total	30			420		180	600

APE-Advanced Programming Environment

M.Sc. (I.T.) [Five Year Integrated Course]

B.Sc. (Information Technology)

Semenster VII

Paper Title : Advanced Programming Environment-I (Net & C#) (701)

1. **NET Architecture**
2. *Introduction to C#*
   The development of C#, Comparison with C,C++, VB, and Java
3. **C# Language**
   Data Types, C# Predifined Types, Complex Types, Variables, Constants, Operators, Flow Control, Program Structure
4. **Object Orented C#**
   Method Overloading, Construction & Disposal, Operator Overloading, Indexers, interfaces, Collections.
5. **Exception & Error Handling**
6. **Delegates**
7. **Events**
8. **C# Preprocessor Directives**
9. **Assemblies, Threads, and App Domains**
10. **C# and Windows Forms**

Main Readings:

1. C# and the. NET Platform - Andrew Troelsen- a! Press
2. Professional C#-Work

Supplementary Readings:

1. C# The Basics-Vijay Mukhi
2. C# Essentials-Ben Albabari
3. C# The Nuts & bolts-Akash Sarat & Sonal Mukhi
4. C# Made Simple - BPB Publication

M.Sc. (I.T.) [Five Year Integrated Course]
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Semenster VII

Paper Title : Advanced Programming Environment-II (VB. NET & ASP. NET) (702)

1. **VB. NET Programming Basic**
   Working with Data Structures, VB. NET Controls, VB. NET Events, Building Windows Applications, Sub Procedure, Functions, Arrays, Timers, Files, Printing displaying Dialog Boxes, Multiple forms, Standard Modules, Menus
2. **Advanced Object-Oriented Techniques**
   Classes, Objects, Inheritace, Containment, Event Handling, Delegates, Interface, Interacting with objects, early-Late binding
3. **Debugging and Error Handling**
4. **Interacting with Input/Output files.**
   Directories, Files, Path, Directory Info, File Info Classes, Streams, etc.
5. **Accessing Databases with SQL Server and ADO. NET**
   ADO. Net Important components, Providers, Structure & working with DataSet., Using Dataset & Dataviews
6. **Building Class Libraries, Your own Custom Controls & Programming Custom Graphics**
7. **Programming ASP. NET with VB. NET**
   Constants, Variables, Data types, Operators, Control Structure & Prodecural Programming, How dynamic Website Application works, Processing of ASP>NET Application, The common Language Runtime (CLR)
8. **Event Driven Programming and Postback**
   ASP. NET Events, HTML Events, Server Control Events is ASP. NET. Event Driven Programming and Postback.
9. **Objects & Components is ASP. NET.**
   Namespace, Page Class, Request Object, Response Object, Server Object, Components & Control
   State Handling
   Session State, Cookies
   Scripting Object Model

10. Objects & Structured Data
Collection, types of Collection, Arrays as Collection, Array list, Hash table, Sorted list.

11. Web Services and ASP. NET
Web Service Development, WSDL & SOAP, Web Services Background

12. Reading & Manipulating with Data Soruce
ADO. NET, ADO. NET Object, Connection, Command, Data Reader, Data Set, Data Table, Data Row Object, Disconnected Data, Methods for Updating Data, Data Adapter Command.

13. ASP. NET Server Controls
Rich Object Model, Automatic Browser Detection, Properties, Evets, Page Life cycle.

Main Readings:

1. Beginning VB. Net-Wrox.
2. Visual Basic. Net Programming.
3. Beginning ASP. NET Object Oriented Programming-Techmedia-New Riders
4. ADO. NET Programmer's Reference-Wrox

Supplementary Readings:

1. Visual Basic. Net Programming Black Book.
2. VB. NET Programming Developer's Guide-Dreamtech
3. ASP. NET for Developers-Techmedia - Amundsen

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Semenster VII

Paper Title : Software Engineering (703)

1. Software Matrix & Project Planning
Software Measurements, Metrics for Software Quality, Project Planning, Objectives, Software Scope, Resources, Decomposition Techniques, Empirical Estimation Model, Make-Buy Decision.

2. Risk Management
Software Risk & Risk Identification
Risk Identification, Projection, Migration, Monitoring, Management

3. Project Scheduling & Tracking

Relationship between People & Effort, Defining a Task set for the Software Project, Selectingn & Refining Software Engineering Tasks, Scheduling.

4. **Software Quality Assurane**
   Software Quality & Assurance, software Review, Formal Technical Review, Software Quality Metrics, Formal Approaches to SQA, Software Reliability. ISO 9000 Quality Standards
   ISO Approach to Quality Assurance systems
   The ISO 9001 Standards
5. **Object Oriented Concepts & Principles**
   Object Oriented Paradigm & Concepts, Identifying the elements of an Object Model Management of Object Oriented Software Projects
6. **Object Oriented Analysis & Design**
   Domain Analysis, Generic Components of the OO Analysis & OOA Process.
   Object Relationship Mode. Object Behavior Model.
   Generic Components of the OO Design & System Design Process
   Object Design Process & Design Pattern

Main Readings:

1. Software Engineering A Practitioner's approach-Roger S Pressman-McGraw Hill
2. Object Oriented Modeling Design-James Rumbaugh, Michael Blaha-PHI
3. An Integrated Approach to Software Engineering- Pankaj Jalote-Narosa Publication.

Supplementary Readings:

1. Software Engineering Concepts- Fairley R.E.- McGraw Hill
2. Software Engineering-Lewis T G- McGraw Hill
3. Fundamentals of Software Engineering-Carlo Ghezzi
4. IEEE standard for software user documentation, std 1063-1987
5. Software Engineering- A programming approach, D. Bell, I. Morrey, PHI

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Semenster VII

Paper Title : Operation Researnch (704)

1. **Linear Programming**
   Formulation of L.P.P., Solution Methods, Graphical Method, Simplex Method, Two Phase Method, Big-M Method
2. **Special cases of L.P.P.**
   Transportation Problem, Assignment Problem
3. **Job Sequencing**
   Processing n jobs through 2 machines, Processing n jobs through 3 machines,
   Procenssing 2 jobs through m machines, Processing n jobs through m machines,
4. **Inventory Problem**
   Introduction to Inventory, Deterministic Inventory models, Dynamic Inventory models.
5. **Network Analysis**
   PERT, CPM

Main Readings:

1. Hiller F.S. & Liberman G.J.-Introduction to Operation Research, 2nd Edition-Holand Day Inc. London, 1974
2. Tata H.A., Operation Research, 3rd Edn. - McMillan Publishing Company, 1982

Supplementary Readings:

1. Beightler C.S. & Phillips D.T.-Foundation of Optimization-Prenntice Hall, 1979
2. McMillan claude Jr.- Mathematical Programming 2nd Edition-Wiley Series, 1979
3. Gillet B.G.-Introduction to Operation Resenanrch- A Computer oriented Algorithmic approach-McGraw Hill Book Comp., 1976
4. N.S. Kambo-Mathematical Programming Techniques-East-West Press, New Delhi, 1991

Practical-I Net framework and C# Lab (705-I)

1. Programs showing OOP concepts
2. Programs showing use of Exception handling
3. Creating custom Graphical User Interface
4. Programs showing user of Multithereading

5. Programs showig use of Graphics and multimedia
6. Programs showing use of files and streams
7. Programs showing use of XML, ADO. Net, and Database connectivity

Practical-II VB NET Lab (705-II)

1. Creating MDI Applications using VB. Net
2. Creating Web Forms and validating them in VB. Net
3. Object Oriented concepts in VB. Net-Inheritance, encapsulation, run-time polymorphism
4. Accessing the file system-making a FTP explorer on the lines of windows explorer.
5. Custom classes and graphics
6. Installing and running Web server for processing ASPX sites
7. embedding objects in web pages
8. Connecting web site to databases using ADO. Net.
9. Creating a web-based mailing facility for intranet

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Semenster VIII
Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical Duration		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Prac	Hrs	Marks	Hrs	Marks	
801	WADT-I	4	-	3	70	2	30	100
802	WADT-II	4	-	3	70	2	30	100
803	EL-I (one of following (i) MIS (ii) DSS (iii) Parallel Processing & Acrhitecture	4	-	3	70	2	30	100
804	EL-II (one of following)n (i) Information Security & Applications (ii) Embedded Systems (iii) Distributed Computing	4	-	3	70	2	30	100
805	Seminar	-	6	6	100			100

806	Practical (WADT-I, WADT-II)	-	8	6	35+35 =70	4	30	100
	Total	30			450		150	600

WADT-Web Application Development Techniques
MIS- Management Information System
DSS- Decision Support System

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Semenster VIII

Paper Title : Web Applications Development Techniques-1 (JSP) (801)

1. **Introduction**
   JSP Advantage, comparing JSP with ASP
2. **JSP Architecture**
3. **JSP Access Models**
4. **JSP Syntax Basics**
   Directives
   Page Directive, Include Directive
   Declarations, Expressions, Script lets, Comments
5. **Object Scopes**
6. **JSP Implicit Objects**
7. **Synchronization Issues**
8. **Exception Handling**
9. **Session Management**
10. **Standard Actions**
    Using Java Bean Components
    Forwarding Requests
    Request Chaining Including Requests

Main Readings:

1. Java Server Pages-Hans Bergsten-O'Reily
2. Java Server Pages-Larne Pekowsky-Addison-Wesley

Supplementary Reqdings:

1. Programming Java Server Pages & Servlests - Er. V.K. Jain
2. Instant Java Server Pages- Paul Tremblett

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Paper Title : Web Application Development Techniques-II (Servlets Java Beans) (802)

PART-I (Java Servlets)

1. **Introduction to Servlets**
   Servlets Basics, Servlets API Basics
2. **Advanced Serviet Concepts.**
   Writing Thread-Safe Servlets, HTTP Redirects, Cookies, Request Forwarding, Database Access with JDBC, Security Java Server, Packaging and Deployment, Servelets Troubleshooting.

PART-II (Enterprise Java Beans)

1. **Objectives and overview**
2. **Enterprise Java Beans Technology**
   The EJB Container
   Enterprises Beans
   Remote and Home Interface, Business Methods, Entity Beans, Session beans, Life Cycle Methods, Back to the Remote and Home Intenrfaces
   Enterprises Beans as Distributed Objects
3. **Entity Type Enterprise Beans**
   Container-Managed Peristence
   Bean Class, Home Interface, Remote Interface, Callback Methods
   Bean-Managed persistence
   Session Type Enterprise Beans
   Stateless Session Beans, Statefull Session Beans
4. **Deploying Enterprise Java Beans Technology Solutions**
5. **Enterprise Java Beans Clients**

Main Readings:

1. Developing Java Servlets-James Goodwill-Techmedia
2. Java servlets-Karl Moss-TMH
3. Enterprise Java Beans- Richard Monson.

Supplementary Readings:

1. Programming Java Server Pages & Servlets-V.K. Jain
2. Java Beans Develpers Reference-Dan Brookshier.

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Semenster VIII

Paper Title : Management Information Systems (803)

1. **The meaning & rolr of MIS**
   What is MIS? What is systems approach? The systems view of Business,
   The importance of information, Relationship of information tno IRM,
   The manager & types of information, The effective MIS
2. **Development of effective MIS**
   Systems prior to MIS, Past & current MIS., MIS Development process., Management, Information & the systems approach, Basic IO like marketing, financial etc., Descion making & MIS, Decision support sysntem, Charancteristics of DSS., System classification.
3. **Strategic & Project Planning**
   General business planning, Appropriate MIS response, General MIS planning, Detailed MIS planning
4. **Conceptual System design**
   Define problems, See systems objectives, Establish system constraints., Determine information needs, Determine information sources, Develop alternative conceptual design & select one, Document the system concepts
5. **Detailed System design**
   Inform & involve the organization, Aim of detail design, Project management of MIS detailed design, Identify dominating & tradeoff criteria, Define the System listing, Document the design
6. **Pitfalls if MIS development**
   Fundamental weaknesses, Soft spot if planning, Design problem, Implementation problem.
7. **Supply Chain Management.**

Main Readings:

1. Murdick, Ross and clagget : Information Systems for modern management-PHI

Supplementary Readings:

1. Beneet: Building Decision support System-Addision Wesley

2. Senn: Analysis & Design of Informatio
3. Lucas: Analysis Design and Implementation of Information Systems-TMH
4. David: Applied Decision Support-PHI
5. Kanter J.: Management Information Systems-PHI
6. Prasad LM: Principles of Management-PHI
7. Kuntz: Principles of Management-TMH

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Semenster VIII

Paper Title : Elective-I (ii) Decision Support System (803)

1. **The Problem Solving Process**
2. **The Analytic Modeling Process.**
3. **Descro[tove Assessment - Criteria and Weights.**
4. **Descriptive Assessment-Alternatives and Ranking**
5. **Values and Normative Choice**
6. **Choices Under Uncertainty.**
7. **Uncertainty and Nornmative Choice**
8. **Sequential Decision Making.**
9. **Multi-Actor Decision Making.**
10. **Constraint-Based Policy Optimization. Solution to Problems**

Reference:

Efrem G. Mallach: Decision Support and Data Warehouse Systems-TMH

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Semenster VIII

Paper Title : Elective-I (iii) Parallel Processing & Architecture (803)

1. **Introduction to Parallel Processing**
   Generation of Parallel Computers
   Architecture
   Classification Schemes
   Parallel Processing Applications, Memory Sub Systems and output management Pipelining and Vector Processing, Inter Connection networks and Processors.
2. **Multi Processor Architecture and Programming**
   Parallel Programming Language environment.

3. Dataflow Computers

Static Dataflow

Dynamic Dataflow Architectures Advance topics

Main Readings:

1. Kai Hwang, F. Bringgs, Computer Architecture and Parallel Processing-TMH
2. M. Flynn, Computer Architecture, Narosa Publishing

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Semenster VIII

Paper Title : Elective-II (i) Information Security and Applications (804)

1. Introduction

Security Attacks on Data/Software, Hardware, Network.

2. Classical Encryption Techniques

Caesar cipher, Mono alphabetic cipher, Poly alphabetic cipher, Transposition techniques-Private key cryptography and Data Encryption Standard using biometrics-Public key cryptography and diffie-Hellman key exchange-Hashing and Digital Signatures-Authentication Protocols.

3. Network Security

Firewall Design Principles, IP Security Policy.

4. Introduction to E-Commerce-Electronic Voting/Polling systems

Stadards and Applications.

Main Readings:

1. William Stallings: Cryptography and Network Security-Principles and Practice, Prnatice Hall
2. Bruce Scheneir: Applied Cryptography, John Wiley.

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Semenster VIII

Paper Title : Elective- (ii) Embedded Systems (804)

1. Introduction

Embedded systems Introduction: Processor Technologies, Implementation Technologies, and general dsign technologies. General Purpose Processors and the 8051, development enrironment system on a chip Trends. Hardware and software

requirements.

2. **Microcontrollers**
   Different type of micro controllers, Embedded Microcontrollers, Processor architecture Memory types, Microcontroller features.
3. **Hardware Design**
   Single chip design, Multiple chip designs, Processor core, memory devices, SRAM, DRAM flash memory and SDRAM controller, type of PROM, memory management.
4. **On chip design,**
   Busses, access arbitration, timing and protocols, In circuit programming, Internal Peripherals, EMC considerations, Microprocessor clocks, designing custom processors (combinational logic design, sequential logic design, custom processor design).
5. **Interrupts & Timers**
   Various types of Interrupts, Interrupts priority, ISR, DMA, timers and counters, Watchdog timer.
6. **Serial communication**
   UART, SPI and 12C Parallel I/O interface and signal handshaking
7. **Real world Interfacing.**
   Transducers and Sensors, touch Panel, A/D-D/A converters, keyboards, LCD, VGA Interfaces.
8. **Real time Operating systems**
   Multitasking Memory management resource Management, RTOS & Interrupts, Applicability of RTOS.
9. **Embedded system Design & Application.**
   PWM motor control, Aircraft control, Remote operation control with an Infrared TV remote control, Light Sensors & Robot.
10. **Embedded Software**
    Design goals for Embedded Softwares, choosing language for programming, Data representations, tools available.

Main Readings:

1. The 8051 Microcontroller & Embedded Systems, Muhammad Ali Mazidi, Pearson Education.
2. Programming & Customizing the 8051 Microcontroller. Myke Predko, TMH Edition 1999.
3. Embedded Microprocessor Systems: Real World Design. Stuart R. Ball, 3rd Edition, Newness Publication.
4. Fundamentals of Embedded software where C and Assembly

meet. Daniel Levis, Pearson Education.

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Semenster VIII

Paper Title : Elective-(II) Distributed Computing (804)

1. **Distributed Computing:**
   Distribution of Data and Control: Clock Synchronization, distributed termination problem, load distribution electios, agreement problem, Deadlock in distributed systems, Intronnduction to Fault-tolerant computing.
2. **Advanced Distributed Computing**
   High level language support for distributed computing: message passing primitives, atomic action, RPC mechanisms, Implementations of these features. Case study of some distributed languages as well as distributed programming architectures like LINDA and CORBA, COM. etc.

Main Readings:

1. G.F. Colouris and J Dollimore: Distributed Systems: Concepts & Design Addison Wesley, 1988.
2. S. Muliender (EC): Distributed Systems, Addison Wesley, 1988.

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Semenster VIII

Paper Title : Seminar (805)

The students are required to prepare seminar work on the titles approved by the faculty. These topics will cover the latest in the fields of IT and Computing. The external examiner designated by the University of Rajastha will mark these based upon the seminar reports submitted by the students.

Practical: Web Application Development Techniques (806)

WADT-I

Assignment 1: Creating an online diary for every student in a particular class. The class teacher must have administrator rights to add/remove any student; to add/remove any entry in the diary. The studetns will have rights to add to their diary entries; to view their and others diary entries.

Assignment: 2 Create an online shoppint cart for a jewelry store. The displaying of images and navigation through the site must

be through run time links. The information added msut be available for editing and removal later.

Assignment: 3 Create an online hotel management system that allows to browse for the facilities available, registration for events, reservation for event tickets and rooms, online booking, check-in and check-out facilities.

WADT-II

1. A Java Servlet is a mini server-side program that services HTTP requests and returns result as HTTP response. A good analogy for a servlet is as a non-visual applet that runs on the web server. When a user issues a request for a specific servlet, that server will simply use a different thread and then process the individual request. Servlets can run on any platform.
2. Write a Servlet to process the incoming request from an applet that takes user's name and city and gives details of the city to the user in the same applet. The details of 5 such cities (at least) are maintained in txt files of fixed formats. Decide your-self on the format of these files.
3. Deploy an EJB on your web server that will accept the name and location of a remote database and other connection parameters. The EJB will contact this db and return if a connection could be established or not.

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Teaching and Evaluation Scheme

Paper code	Paper Title	Teaching schedule (Hours/ week)			University Exam Theory/ Practical		Internal Exam Theory/ Practical		Total Theory/ Practical
		Lect	Tut	Prac	Duration Hrs	Marks	Duration Hrs	Marks	
901	Mobile Computing	4	1	-	3	70	2	30	100
902	Artificial Intelligence	4	1	-	3	70	2	30	100
903	ELECTIVE-I (one of following): i) Open Source Application Development (ii) Advanced Computer Networks	3	1	-	3	70	2	30	100

	(iii) IT & Cyber Law								
904	ELECTIVE-II (one of following): (i) Data Warehousing (ii) Language Processors (iii) Algorithm Design and Analysis	3	1	-	3	70	2	30	100
905-I	Practical-I (Elective I, 903-(i)	-	-	6	6	35+35 =70	4	30	100
905-II	Practical II (Elective II),	-	-	6	6	35+35 =70	4	30	100
	Total			30		420		180	600

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Paper Title : Mobile Computing (901)

1. **Introduction to Mobile Computing and Personal Communications Services**
   Mibility, Nomadic, Mobile and Ubiquitous computing
   Mobile Computing Architecture, Mobile Devices,
   Mobile Computing Technology (H/W, S/W, Communication)
   PCS Architecture, Mobility Management, Networks signaling,
2. **Global System for Mobile Communication (GSM) system overview:**
   GSM Architecture, Mobility Management, Network Signaling
3. **General Packet Radio Service (GPRS)**
   GPRS Architecture, GPRS Network Nodes.
4. **Wireless Applications Protocol (WAP)**
   The Mobile Internet Standards, WAP Gateway and Protocols, Wireless Markup Language (WML)
5. **third Generation (3G) Mobile Services**
   Introduction to International Mobile Telecommunications 2000 (IMT 2000) Vision, Wideband Code Division Multiple Access (W-CDMA), CDMA 2000, Quality of services in 3G
6. **Wireless Local Loop (WLL)**
   Introduction to WLL Architecture, WLL Technologies
7. **Global Mobile Satellite Systems**
   Case Studies of the IRIDIUM and GLOBALSTAR systems
8. **Wireless Enterprise Networks**

Introduction to virtual Networks, Blue Tooth Technology, IR, Blue Tooth Protocols

Main Readings:

1. "Wireless and Mobile Networks Architectures", by Yi-Bing Lin & Imrich Chlamtac, John Wiley & Sons, 2001
2. "Mobile and Personal Communication system and services", by Raj Pandya, PHI, 2001
3. 'Guide to Designing and Implementing wireless LAN's", by Mark Ciampa, Thomson learning, Vikas Publishing house, 2001.
4. "Wireless Web Development" Ray Rischapter, Springinger Publishing, 2000
5. "The Wireless Application protocol" by Sandeep Singhal, Pearson Education Asia 2000
6. "Third Generation Mobile Telecommunication systems, by P. Starvronlakis, Springer Publishers, 2001.

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Semenster IX

Paper Title : Artificial Intelligence (902)

1. **Prolog**

   Facts, Objects, Predicates and Rules, Prolog variable and its type, Arithmetic & relational operators, I/O predicates, String operations, fail & predicates, Recursion & repeat predicates, List and various operation on lists, File operations predicates, Dynamic & Static database, Type conversions, Screens & window predicates, graphics predicates.

2. **Introduction to AI**

   Overview of AI application area

   Automated reasoning & Theorem proving, Expert systems, Natural Language, Understanding & Semantic modeling, Modeling Human performance Planning & Robotics

   AI problem characteristics

3. **Calculus**

   Prepositional, Predicate, Produce predicate calculus expressions from Inference rules.

4. **State Space Search**

   Structure for State Space Search, State Space representation of Problem, Strategies for State Space Search, Represent reasoning

with predicate calculus using state space, Recursive & Pattern-Directed search, Production system.

5. **Heuristic Search**
6. **Knowledge representation**
   Approaches & issues in knowledge representation, Network representation Structures Semantic nets, Frames, Scripts, Fuzzy Logic
7. **Natural Language Understanding**
   Level & Stages of Natural Language analysis, Specification & Parsing using Context-Free Grammers, Transition Network Parsers, Chomsky Hierarchy & Context-Sensitive Grammars, Combining Syntax & Semantics.
8. **Expert Systems**
   Representing & Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition
9. **Handling Uncertainty**
   Non-Monotonic Reasoning, Probalistic Reasoning, Use of certainty factors, Fuzzy logic
10. **Learning**
    concept of Learning, Learning Automation, Genetic Algorithms, Learning by Induction, Neural nets.

Main Readings:

1. Charniak, E.—Introduction of Artificial Intelligence-Narosa Publishin House.
2. Marcellus—Expert Systems Programming in TURBO PROLOG-Prentice-Hall Inc.
3. Eliame R.—Artificial Intelligence-Prentice-Hall Inc.
4. Hunt, E.B. —Artificial ntelligence-Academic Press.
5. Lloyd. J., - Foundation of Logic Programming- Springer-Verlag
6. Clockskin, W.F. and Mellish, C.S.- Programming in Prolog-Narosa Publ. House
7. Carl townsend - Introduction to Turbo Prolog- B.P.B. Publication.

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Semenster IX

Paper Title : Elective-I (i) Open source Application Development (903)

1. **Introduction to LINUX**
2. **The GNU Projects, free software foundation and Linux distribution**
3. **LINUX Architecture**
4. **Introduction to PHP**
5. **Language features**
   Language constructs, Variables, declarations and types, Constants,
   Use of Operators, Control Structures, Functions
6. **Object Oriented Features of PHP**
   Classes and Objects, Use of constructors, Serialization
7. **PHP inbuilt Functions**
   String Functions, Array functions, Mathematical Functions, Graphics Library (GD support), File System Functions, Date and Time Functions, Misc. Functions
8. **Database Connectivity**
9. **Perl basic**
   Introduction, Data types, Operators, Control statements, Arrays
10. **Functions**
    String Functions, Array Functions, Mathematical Functions, Time/Date Functions, File Handling, Understanding files & Directories, Opening & Closing files, Working with Directory.
11. **Database Connectivity**
    Database access using perl, ODBC object method
12. **MySQL Database Server**
    Configuring the MySQL Server, Starting MySQL Server, MySQL Tables, Displaying MySQL Database, Adding and removing user access, Checking and fixing database.
13. **Red Hat Linux Network and Server Setup**
14. **Setting up a Local Area network**
15. **Print Server**
    Choosing CUPS or LPRng Print Services, Setting up printer, Working with CUPS printing, Managing printers, Using print-

ing commands, configuring print servers

16. **File server**
    NFS, Samba, Netware
17. **Mail Server**
    Introduction to SMTP and sendmail, Installing and running sendmail, Configuring sendmail, Intoducing Postfix, Getting mail from the server (POP), Administering a mailing list
18. **FTP Server**
    Understanding FTP server, Secure FTP server (vsFTPd)
19. **Web Server**
    Introduction to web server, Configuring Apache web server, Starting and stopping web server, Monitoring server activities.

Main Readingsl:

1. Red Hat Linux Bible-Nigus-Wiley
2. Linux in NutShell-Ellen siever
3. Beginning ASP. NET Object Oriented Programming-Techmedia-New Riders
4. Visual Basic. NET Object Oriented Programming-Techmedia-New Riders

Supplementary Readings:

1. Visual Basic Net Programming Black Book.
2. VB.NET Programming Developer's Guide-Dreamtech
3. Linux Application Development-Michal K Jhonson
4. Linux completer-Grant Tatlor
5. Integrating Linux & windows-Mike
6. Installing Red Hat Linux-William Van Hagen
7. Red Hat Linux System Administration Unleashed - Thoman

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Semenster IX

Paper Title : Elective-I (ii) Advanced Computer Networks (903)

1. **TCP/IP Protocol Suit**
   TCP/IP Architecture, TCP Protocol, UDP Protocol, The IP Protocol, ARP, RARP, ICMP, IGMP
2. **Applications**
   Client-Server Model-Concepts, BOOTSTRAP (BOOTP), DHCP, domain Name Systems (DNS), Network virtual Terminal (TELNET), File Transfer Protocol (FTP), Trivial FTP, Mail

Transfer Protocols SMTP, MIME, POP, IMAP.

3. **Interposes Communication**
   File and record Locking, Pipes, FIFO's, Stream and Messages, Message Queues Semaphore
4. **Sockets**
   Socket System Cells, Reserved Parts, Stream and Stream Pipes, Asynchronous I/O, I/O Multiplesing
5. **Remote Procedure Cells**

Main Readings:

1. A.S. Tanenbaum-Computer Networks-PHI New Delhi 1997
2. Bahrouz Forouxon-TCP/IP Protocol Suit, Tata Mcgraw-Hill Edition 1998
3. A. Stevens, "TCP/IP Illustrated", Vol. 1-3, Addison Wesiey, 1998
4. R. Stevens, "Unix networking Programming", PHI 1998
5. J. Martin, "TCP/IP Networking—Architecture, Administration and Programming", Prentice Hall, 1994
6. D.E., Comer, "Internetworking with TCP/IP, Vol. 1, Principles, Protocols and Arechitecture, PHI 2000
7. W. Stalling—Data and Computer Communications, 3rd Edition, Macmillan Pub. Co., New York 1991
8. Matthew MacDonald—Microsoft. NET DISTRIBUTED APPLICATIONS—Tata Mcgraw Hill Edition 2003.

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Paper Title : Elective-I (iii) Information Technology and Cyber Law (903)

1. **Information Technology and Legal Response**
   Introduction Objective, Cyberspace and Out Lives, The Nature of the Net Features of the Net, Geographical Indeterminancy, Information technological revolution and social impact
2. **Sources of the Law**
   Introduction, Objective, Sources of Law, the Significance of Legislation,
   The common law or uncodified Law, Precedent as a Source of Law,
   Branches of law

3. **The Judicial System**
   Introduction, Objective, Institutions of the Judicial System, Courts Tribunals, Procedure in Civil Cases, Procedure in Criminal Cases, Officers of Court
4. **Structure of Government**
   Introduction, Objective, Framing of the Constitution, government Functions, Processing of Bills, Legislation: Subject to judicial review, Public interest litigation
5. **Information Technology and the Attempted Legal Response**
   Introduction, Objective, Primary ssumptions of a legal system, Sovereignty Territorial Enforcement, Notion of Property, Real Relationships Paper Based Transactions, role of the Judiciary in the evolving legal framework
6. **Cyber Crimes**
   Introduction, Objectives, Cyber Crime—A perspective, The Problem: Current forms of Computer Crime, Infringements of Privacy, Economic offences, Computer Hacking, Computer Espionage, Software Piracy and other forms of Product Piracy, Computer Sabotage and Computer Extortion, Computer Fraud, Illegal and harmful contents, Other offences, Attacks on Life, Organized Crime, Electronic Warfare, Classification of Cyber Crimes in I.T. Act, 2000
7. **Cyber Contracts**
   Introduction, Objective, Cyber Contract, Essentials of a contract, Intention to be bound, Offer and Acceptance, concept of offer, Offer by and to whom, Statements which are not offers Termination of offer, Quality of acceptance, Consideration, Capacity of the parties, Consent Unlawful aggrements, Persons bound by contract, Performance and frustration, Subsequent Events and Frustration, Remedies for Breach of Contract, Damages, Specific performance, Injuctions.
8. **Cyber Privacy**
   Introduction, Objective, Cyber Privacy- A perspective, Policy approaches to privacy concerns, Market approach, Human rights approach, Contract approach, Platform for Privacy Preferences Project (P3P).
9. **Cyber Intellectual Rights1**
   Introduction, Objective, concept of Intellectual Property Rights,

Role of Intellectual Property in Developing Countries, The Impact of Electronic Commerce on Intellctual Property, Teh Protection of Copyright and Related Rights In the Digital Environment, Overview of the Issues, Technological protection measures, Future work in the protection of copyright and related rights, PATENTS, Patentable Subject Matter, Prior Art Effect, Enforcement of Rights TRADEMARKS AND UNFAIR COMPETITION, Trademarkds, Establishment and Maintenance of Trademark Rights, Infringement of Trademark Rights Through Use of a Sign on the Internet, Global Effect of Injunctions Well-Known Marks, Unfair Competition Domain Names, Background WIPO Internet Domain Name Aprocess, Uniform Administrative Procedure Concerning Abusive Domain name Registrations, Exclusions for Famous and Well-Known Marks, Outstanding Issues in domain Name Process.

10. **Information Technology Act, 2000 (I.T. Act, 2000)**
Introduction, Objective, The Information Technology Act, 2000: An Overview, Transmission of electronic documents, Evidentiary presumptions of a secured electronic document, Certifying Authority (CA), Controller of Certifying, Authorities, Suspension of Certifying Authority, Digital Signature, Digital Signature: Power of Central Government to make rules, Digital Signature Certificate, Revocation of Digital Signature Certificate.

11. **Penalties and adjudication**
Introduction, Objective, Penalties and adjudication : A brief overview, Penalty for damage to computer, computer system, etc, Penalty for failure to furnish, information return, etc., Residuary penalty (Section 45), Power to adjudicate, Cyber Regulations Appellate Tribunal, Composition of the Cyber Appellate, Tribunal, Right of Appeal to cyber Regulations Appellate Tribunal, Procedures and powers of the Cyber Appellat Tribunal, Compounding of Contravention Jurisdiction of Civil Court, Appeal to High Court on order of Tribunal

12. **Amendments to current legal provisions**
Introduction, Objective, Amendments to the Indian Penal code, Amendments to the Indian Evidence Act, 12872, Amendment to the Bankers Books Evidence Act, 189, Amendment to the Reserve Bank of India Act, 1934.

Main Reading:

1. Cyber Laws. Krishna Kumar Dominant Publishers
   Project preferably in Industry.

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Semenster IX

Paper Title : Elective-II (i) Data Warehousing (904)

1. **Introduction**
   Data Warehouse, Objectives, Difference between OLTP and Data Warehouse, Critical success factors, Data mining and its advantages. META data. Issues related to Data Warehouse.
2. **Project Planning and Management**
   Scope, role and Responsibilities, Life Cycle approach
3. **Data Warehouse Architecture—System Process**
   Introduction, Process flow within an data warehouse, Extract and Load Process, Clean and Transform data, Backup and Archive Process, Query Management Process
4. **Data Warehouse Architecture—Process Architecture**
   Introduction, Load and Warehouse Manager, Query Manager, Detailed and Summary Information, Metadata, Data Marting.
5. **Database Design—Logical**
   Database Schema—Starflake, Partitioning strategy, Aggregations, Data Marting, Metadata, System and Data Warehouse Process Manager.
6. **Database Design-H/W and Operational**
   H/W Architecture, Physical Layout, Security Backup and Recovery, Service, Level Agreement, Operating Data Warehouse

Main Readings:

1. S. Anahory & D. Murray: Data Warehousing in the real world—Addison Wesley
2. R. Kinbal: Data Warehouse Toolkit—John Wiley & sons.
3. R. Kinball, L. Reeves: The Data Warehouse Lifecycle Toolkit—John Wiley & Sons
4. Efrem g. Mallach: Decision Support and Data Warehouse Systems-TMH
5. Paulraj Pullian: Data Warehousing Fundamentals-Wiley

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Paper Title : Elective-II(ii) Language Processor (904)

1. **Introduction to System Software, Utility Software, Systems Programming.**
2. **Assembers:**
   Introduction, Cross assembler, Micro Assembler, Meta Assemble, Single pass Assembler, Two Pass Assembler, Design of Operation code table, Symbol table, Literal table.
3. **Macro Processor**
   Introduction of Macros, macro processor design, Forward reference, Backward reference, positional parameters, Keyword parameters, conditional assembly, Macro calls within Macros, Implementation of macros within Assemblers. Designing Macro name table, macro Definition table, Kew word parameter table, Actual parameter table, Expansion time variable storage etc.
4. **Compilers**
   Introduction, Analysis of the programme, Lexical Analysis, Syntax analysis, phase of a compiler, Scanning, Parsing, type checking and coversion, Storage organization and allocation strategies, Symbol tables, parameter passing, local and non local variable, Intermediate code generations of declaration, Assignment statement. Boolean Expression, Conditional Statement etc., Code generation, Code optimization, Compiler writing tools e.g., (Lex, Yacc), Incremental Compiler, Interpreter.
5. **Loader and Linkage Editor**
   Absolute Loadr, Relocation-Relocating loader, Dynamic loader, Bootstrap loader, Linking loader, Program relocatibility, design of Absolute Loader, Design of direct—linking editor, other loader scheme e.g., (Binders, Linking Loader, Overlays, Dynamic Binders etc.)

Main Readings:

1. D.M. Dhamdhere: systems Programming & Operating System, TMH Edition, 2nd Edition 1996.
2. John J. Donovan: Systems Programming, McGraw-Hill International Edition, 1993 Reprint.

3. Houlb: Compiler Design in C, PHI, EEE, 1995.

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Paper Title : Elective-II (iii) Algorithm Analysis and Design (904)

1. **Introduction :**
   Concept of an algorithm, program, problem; Review of elementary data structures; symptotic complexity, Notation—Priori, Posteori analysis
2. **Divide & Conquer:**
   General method—control abstraction-Max Min recurring relations; sorting; Erge Sort, quick sort, Selection sort, Computing time.
3. **Greedy Method:**
   General details, Optional Storage on tapes; Knapsack problem-Job Sequencing- Merge patterns-Minimum Spanning trees-Shortest path.
4. **Dynamic Programming:**
   General details, multistage graphs: All pair Shortest paths ortimal bin; each trees; 0/1 kna psack; Travelling salesman problem:
5. **Backtracking:**
   General details, Eight Queens problem, Sum of subsets—Graph coloring, Hamiltonian Cycles; knapsack
6. **Branch & Bound:**
   Method; 0/1 knapsack problem-TSP
7. **NP-Hard and NP-Complete Theory:**
   Basic concepts; Nondeterministic algorithms- 0(n) Sorting-P-complete & NP-Hard theory Example problems
8. **Advanced topics**

Main Readings:

1. Horowitz E & Sahni S- Fundamentals of Computer Algorithms, Galgotia Publications, Reprint 1994.
2. Brassard & Bratley-Fundamentals of Algorithmics PHI EEE 1994

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Semenster IX

Paper Title :Practical I- (Elective I) (903-(i)

Practicals

How to use the "/proc" filesystem to obtain system information.
Advanced Linux features, such as asynchronous I/O.
Building software with Autoconf
How to debug, trace and optimize software for better speed and memory usage
The Eclipse integrated development environment

M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semenster IX

Paper Title :Practical II- (Elective II) (903-(i)

Practicals

1. Through extensive lab exercises, you will gain hands-on experience with leading BI tools, including:
   - Microsoft Data Mining
   - ESRI Business Analyst
   -Hyperion Intelligent Dashboard
   -Poly Vista
   -Tableau
2. How and when to effectively apply advanced BI technology in order to enhance your Information content and analytical landscape

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Semenster X
Teaching and Evaluation Scheme

Paper Title	Teaching schedule (Hours/ week)		University Theory/ Practical		Internal Exam Theory/ Practical		Total Theory/ Practical
	Lect	Prac	Hrs	Marks	Duration Hrs	Marks	
Project	-	30	-				600
Total	30						600

1. **All the Project and Practical marks shall be assigned in consultation with External Examiner to be appointed by university of Rajasthan.**
2. **All Practical shall be explicitly specified.**
3. **The Project will have 100 marks for the presentation to be made by the candidate related to project conceptualization, implementation strategy, development cycle, applicatbility etc.**
4. **The students are required to carry out proect work for part time during the semester (Preferablyy in industry).**

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UNIVERSITY OF RAJASTHAN JAIPUR

RULES FOR THE AWARD OF GRACE MARKS

A. UNDER—GRADUATE/POST—GRADUATE (MAIN/SUPPLEMENTARY) EXAMINATION UNDER THE FACULTIES OF ARTS, FINE ARTS, SCIENCE, COMMERCE, SOCIAL SCIENCES, EDUCATION, MANAGEMENT, HOMOEOPATHY, LAW, AYURVEDA AND ENGINEERING & TECHNOLOGY.

Grace marks to the extent of 1% of the aggregate marks prescribed for an examination will be awarded to a candidate failing in not more than 25% of the total number of theory papers, practicals, sessionals, dissertation, viva-voce and the aggregate, as the case may be, in which minimum pass marks have been prescribed; provided the candidate passes the examination by the award of such Grace Marks. For the purpose of determining the number of 25% of the papers, only such theory papers, practicals, dissertation, viva-voce etc. would be considered, of which, the examination is conducted by the University.

N.B. : If 1% of the agregate marks of 25% of the papers works out in fraction, the same will be raised to the next whole number. For example, if the aggregate marks prescribed for the examination are 450, grace marks to the extent of 5 will be awarded to the candidate, similarly, if 25% of the total papers is 3.2 the same will be raised to 4 papers in which grace marks can be given.

General

1. A candidate who passes in a paper/practical or the aggregate by the award of grace marks will be deemed to have obtained the necessary minimum for a pass in that paper/practical or in the aggregate and shown in the marks sheet to have passed by grace.

Grace marks will not be added to the marks obtained by a candidate from the examiners nor will the marks obtained by the candidate be subject to any deduction due to award of grace marks in any other paper/practical or aggregate.

2. If a candidate passes the examination but misses First or Second Division by one mark, his aggregate will be raised by one mark so as to entitle him for the first or second division, as the case may be. This one mark will be added to the paper in which he gets the least marks and also in the aggregate by showing +1 in the tabulation register below the marks actually obtained by the candidate. The marks entered in the marks-sheet will be inclusive of one grace mark and it will not be shown separately.

3. Non–appearance of a candidate in any paper will make him ineligible for grace marks. The place of a passed candidate in the examination list will, however, be determined by the aggregate marks he secures from the examiners, and he will not, by the award of grace marks, become entitled to a higher division.

4. Distinction won in any subject at the examination is not to be forfeited on the score that a candidate has secured grace marks to pass the examination.

Note: The grace marks will be awarded only if the candidate appears in all the registered papers prescribed for the examination.