B.SC.(INFORMATION TECHNOLOGY)
SYALLABUS

SEMESTER 1

Subject

Introduction to Information theory and applications

Mathematics I

Introduction to Digital electronics

Digital Computer Fundamentals

Introduction to Programming

CLASS: B. Sc (Information technology)			**Semester - I**	
SUBJECT: Introduction to Information theory and Applications				
Periods per week 1Period is 50 minutes	Lecture		5	
	TW/Tutorial/Practical		3	
		Hours	Marks	
Evaluation System	Theory Examination	3	100	
	TW/Tutorial/Practical	--	50	

i) Information - Definition, Characteristics & Interpretation, Data & its logical & physical concepts

ii) Computers: History of Computers and their classification, Basic Organization, Memory: - Primary RAM, ROM, EPROM etc. Secondary: - Magnetic-Floppy and Hard disks. Optical: - CDROM, WORM etc. Concept of Virtual Memory and Cache Memory and why are the needed, Computer Operation:- Instruction Cycle, Program flow of control with and without interrupts, Computer Arithmetic:- Number systems binary, Octal, Hexadecimal, Binary Addition, Subtraction and Multiplication, Flotation point representation and arithmetic, Arithmetic through stacks, Computer Language: Introduction to computer language, Definition of assembler Compiler and Interpreter, Basic concept of Data Base Management Systems.

iv) Communication:- Concept of Analog and Digital Signal , Channel Capacity (Shannon's Theorem), Transmission Impairments (Attenuation, Dispersion, etc), Concept of Signal to Noise ratio, Encoding/ Decoding (Concept of Parity bit, Hamming Code), Transmission Media (Twisted Pair, Coaxial Cables, Micro Wave , Optical Fiber and Satellite), A/D and D/A conversion, Definition and Concept of Modulation, Communication technique- circuit switching, message switching and packet switching - their advantages and disadvantages.

v) Networks: Type of Networks (LAN, MAN, WAN, etc), Network configuration: Basic ISO - OSI, Protocols: - What is Protocol?, Why it is needed? ,Token ring, Internet :- Introduction to Internet terminologies and concept of WWW, HTTP, e-mail, GIAS, Search engine, Domain name etc.

Reference

Computer Organization & Architecture- Designing & Performance, William Stallings, Prientice Hall of India
Computer Networks, Andrew S. Tanenbaum, Prientice Hall of India
Information Technology for Management, Henry C. Lucas, McGraw Hill
Boylstead and Neshelesky , "Electronics Devices and Circuits", 4th , PHI, 1999.
George Kennedy, "Electrical Communication systems", Tata McGraw Hill 1993.

Information Technology *The Breaking Wave,* Denis P Curtin, Kim Foley, Kunal Sen, Cathleen Morin, TMG

Information Technology, Project Management, Kathy Schwalbe, Thompson Learning

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
None

CLASS: B. Sc (Information Technology)		**Semester - I**	
SUBJECT: Mathematics I			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Matrices – Adjoint of a matrix, Inverse of matrix, Solving homogeneous & non-homogeneous equations, Matrices – Linear dependence and independence of rows and column matrix, derogetory and non-derogetory matrices, Eigne values and Eigen vectors, Differential Equation of 1sr order 1st degree & application, Differential Equation of higher order & application, Successive differentiation, Mean value theorems, Partial Differentiation, Euler's theorem, Extreme values of function of two variables – application.

Reference

P. N. Wartikar & J. N. Wartikar, "Elements of Applied Mathematics", 7th, Pune Vidyarthi Graha,1988.
B. S. Grewal, "Higher Engineering Mathematics"
Shanti Narayan, "Differential Calculus", Shamalal Charitable Trust, 1997.
Murray Spiegal, "Vector Analysis", McGraw Hill, 1974

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
None

CLASS: B. Sc (Information technology)			**Semester - I**
SUBJECT: Introduction to Digital Electronics			
Periods per week 1Period is 50 minutes	Lecture		5
	TW/Tutorial/Practical		3
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Number Systems and Codes:- Binary, Decimal , Octal, Hexadecimal and their inter-conversions, Codes:- BCD, Excess-3, Gray code etc.

Digital electronic signals and switches: - Concept on digital signal, logic levels, Active high, Active low signals, Switching Characteristic of Semiconductor diode, Transistor.

Logic Gates: - AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR operations and their truth table. Boolean algebra and reduction techniques: - K-Maps and Quine – McClusky.

Arithmetic Operations: - Binary Addition, Subtraction, Multiplication, Division. 2's

Complement Subtraction. Circuits: - Half- Adder, Full Adder, Half Subtracter, Full Subtracter, 2-bit by 2-bit Multiplier , Various Code convertors.

Multiplexers (MUX):- Working of MUX, Implementation of expression using MUX.

Demultiplexers (DEMUX):- Implementation of expression using DEMUX, Decoder.

FLIP FLOP s :- Concept of Sequential circuit, S-R, J-K , Preset & Clear, Master – Slave J–K D , T Flip Flops their truth tables and excitation tables, Conversion from one type to another type of Flip Flop. Registers. Logic families and their characteristics :- Characteristic of Digital ICs .

Text Book
Fundamentals Digital electronics by RP Jain, TMG
Digital electronics by Derek Molly, PHI

Digital Electronics, An Introduction to Theory and Practice William H. Gothmann, Prentice-Hall of India pvt ltd

Term Work
Should contain at least 10 assignments covering the syllabus
Tutorial
Tutorial should contain 5 assignments
Practical
Should contain 5 demonstrations / hands on, covering the syllabus

CLASS: B. Sc (Information technology)		Semester - I	
SUBJECT: Digital Computer Fundamentals			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction to 8085 microprocessor: - Organization of Microprocessor based system, 8085 µp Architecture, Concept of Address line and Memory interfacing, Address Decoding and Memory Interfacing, 8085 Programming Model, Instruction Classification, Instruction Format, Stack and Subroutines, Developing Basic 8085 programs.

Introduction Modern day Computer Systems: - Organization and Architecture, Structure and function.

System Buses: - Computer Components, Computer function, PCI: - Features of PCI bus, Why PCI bus is needed? Concept of PCI Arbitration.
Internal Memory: - Concept of Cache Memory, Methods of Cache Mapping, Concept and need for Cache coherency. External Memory: - RAID.

Input / Output - I/O Modules (What are I/O modules? Why do we require them? Etc.), Concept of Programmed I/O, Concept of Interrupt Driver I/O, DMA

Operating System Support:- Basic Concepts, Batch, Multiprogramming and Time-Sharing, scheduling , Scheduling, Memory Management.

CPU Organization - Register Organization (Classification of registers), Instruction Cycle, Instruction Pipelining.

Concept of Parallel processing: - Multiprocessing: - Organization, Time-Shared Bus, Multiport memory, Central Control unit, Multi processors.

References

William Stallings, "Computer Organisation and Architecture" (4th Edition) - PHI, 1998.
Andrew C. Tanenbaum, "Structured Computer Organisation" (3rd Edition) -, PHI.
Computer System Architecture - M. Morris Memo, PHI, 1998.
John P Hayes, "Computer Architecture and Organisation" - McGraw Hill, 1998.
Digital Computer Fundamentals, Malvino
Microprocessor Architecture and Programming and Applications with the 8085, R.S. Gaonkar, PRI (3rd Edition)

Digital Computer Fundamentals, Thomas C Bartee, TMG

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Should contain 5 demonstrations / hands on, covering the syllabus

CLASS: B. Sc (Information technology)		Semester - I	
SUBJECT: Introduction to Programming C			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

C Fundamentals
Character set, Identifiers and Keywords, Data Types, Constants, Variables and Arrays, Declarations, Operators & Expressions, Library functions, Statements, Symbolic Constants, Preprocessor directives

Data Input and Output
0getchar(), putchar(), scanf(), printf(), gets(), puts() functions

Control Statements
if-else, while, do-while, goto, for statements nested control structures, switch, break, continue statements comma operator

Functions
Function prototypes, passing arguments to a function by value, recursion storage classes, automatic, External, static, register variables in single file environment.

Arrays
Defining - processing array, passing arrays to functions, Introduction to multidimensional arrays, arrays and strings.

Pointers
Declarations, Referencing and de-referencing, passing pointers to functions, pointer to array, Operations on File using pointers.

Concept of Dynamic Allocation of Memory, Linked List.
Structures and Unions , Defining and processing a structure

References

Programming in C by Schuam out line series
Let us C by Yaswant Kanetkar BPB
Practical C programming, O'Reilly
Algorithms with C O'Reilly
A structured Programing approach using C, Behrouz Forouzan, Thomas learning

Mastering Algoritms with C Kyle Loudon, Shroff Publishers

Practical C Programming, Steve Oualline, Shroff Publishers

Term Work
Should contain at least 15 assignments covering the syllabus executed in the laboratory

Tutorial
Tutorial should contain 5 assignments

Practical
C programming

Semester II

Subjects

Mathematics II
Design and analysis of algorithms

Electronics and Tele Communication Systems

Professional Skill Development course

Computer Graphics

CLASS: B. Sc (Information technology)		**Semester - II**	
SUBJECT: Mathematics II			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Complex Numbers – Cartesian, Polar & Exponential form, De-Moiver's theorem, Vector Algebra and Vector Differentiation – Product of three or more vector, Gradient, divergence & applications, Integral Calculus – Double Integral., Triple Integral Differentiation under integral sign – Error functions, Beta and Gamma functions, Properties and duplication formula.

Fourier Series–Orthogonal functions. Fourier series of even and odd functions. Laplace Transform – of all standard functions, Periodic function, inverse laplace transform, application of laplace transform, Complex Variables – Cauchy Riemann Equations, Mapping – Conformal Mapping & bilinear mapping, Concept of line integral, Riemann integral, Singularities – Poles, Evaluation of residues, Residue theorem

Reference

P. N. Wartikar & J. N. Wartikar, "Elements of Applied Mathematics", 7th, Pune Vidyarthi Graha,1988.
B. S. Grewal, "Higher Engineering Mathematics"
Shanti Narayan, "Differential Calculus", Shamalal Charitable Trust, 1997.
Murray Spiegal, "Vector Analysis", McGraw Hill, 1974
Schaum Series, Vector Analysis, Spigel

Advanced Engineering Mathematics with matlab, Thomas L Harman, James Dabney

Norman Richert Brooks/cole, Thompson Learning

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
None

CLASS: B. Sc (Information technology)		Semester - II	
SUBJECT: Designing and Analysis of Algorithms			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction and analysis of algorithms, Elementary data Structures. Arrays, Linked list, Stacks and Queues, Trees, Heaps and Heapsorts, Set and disjoint set union, Graphs, Hashing. Divide And Conquer General method, Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Selection sort, Strassen's matrix multiplication. The Greedy Method, General method, Optimal storage on tapes, Knap sack problem, Job sequencing with deadlines, Optimal merge patterns, Minimum spanning trees, Single source shortage path. Basic Search And Traversal Techniques The techniques of code optimization, AND/OR graphs, Game trees, Bi-connected components and depth-first search. Breadth Search, Back Tracking General method of 8-queens problem, Sum of subsets, Graph coloring, Hamilton cycles, Knapsack problem.

Reference
Knuth 'Fundamentals of Algorithms' (Narosa Publication)
CMA by Tanenbaum
Kruse,Leung,Tondo, "Data structures and Program Design in C", Prentice Hall, 1991.
Writh, " Algorithms + Data Structures = Programmes', Prentice Hall
Aho,Hopcroft, Ullman, "Data Structures and Algorithms", Addison-Wesley.
Horowitz, Sahni, "Fundamentals of Data Structures, Computer Science Press.
Fundamentals of Computer Algorithms, Ellis
Introduction to algorithms, Thomas Corman, R Ronald, PHI
How to solve by Computers, R. G. Bromei, PHI

Mastering Algorithms with C, Kyle Loudon, O'Reilly

Digital Logic, John M Yarbrough, Brooks/cole, Thompson Learning

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
None

CLASS: B. Sc (Information technology)		Semester - II	
SUBJECT: Electronics and Telecommunications Systems.			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Electronics

Concept of Conductor, Semiconductor, Insulator. Semiconductor Diode, Forward bias, Reverse Bias, Application of Diode as Rectifier, Introduction to Transistor (BJT, FET), PNP, NPN Transistors their Characteristic. Introduction to Network Theorems: - KVL,KCL, Superposition, Theremin's, Norton's.

DC Biasing: - Fixed Bias, Emitter Stabilized bias,

Voltage- Divider Bias (including problems). Concept of Q-point. Application of Transistor as Switch.

AC analysis of BJT Transistor using re model (including problems on Av, Ai, Zi, Zo), Application of BJT as single stage Amplifier, Frequency response of single stage Amplifier.

Multistage Amplifiers:- (Basics concepts) RC coupled, cascade, Darlington pair, DC amplifiers,

Concept of Feedback:- Negative Feedback and its advantage in Amplification,

Positive Feedback :- Oscillators, Comparison between Oscillator and Amplifier, RC Phase Shift Oscillator, LC Oscillator.

Switching Circuits Multivibrators : - Monostable using IC 555 and Actable using IC 555 (including problems),

Voltage Regulators: Need of Voltage regulation, Zener diode basics (including problems on Zener diode), Series Voltage Regulation, Shunt Voltage Regulation,

Power Amplifiers: - Class A, B, AB. Design of Single stage Amplifier using BJT.

Telecommunication

Introduction:- Need for modulation system, Concept of Modulation.

AM :- Definition of AM, Modulation index, Power relation in AM, Generation and Demodulation of AM.

SSB:- Power requirement in comparison with AM, Advantages of SSB over AM, Concept of Balanced Modulator, Generation of SSB, Pilot Carrier System, Independent Side System, Vestigial Sideband Transmission.

FM: - Definition of FM, Bandwidth, Noise triangle, Per-emphasis and De- emphasis.

PM: - Definition of PM. Difference between AM and FM. Radio receivers. Pulse

Modulation:- Sampling Theorem, PAM, PTM, PWM, PPM, pulse code modulation, Quantization noise, commanding, PCM system, differential PCM, Delta modulation.

Multiplexing: - FDM/TDM. Television:- Scanning, Composite Video signal, Television Transmitter, television receiver.

Introduction to Digital Communication: PSK, ASK, FSK.

Introduction to fiber optics system:- Propagation of light in optical fiber; ray model .
Types of fiber : Single mode, steps index. Graded index. Signal distortion: attenuation, dispersion. Optical sources: LED, LASERS. Optical Detectors and optics links. Link Budget.

References

Allen Mottershead, "Electronic Devices and Circuits", PHI
Boylstead and Neshelesky , "Electronics Devices and Circuits", 4th , PHI, 1999.
Simon Haykin, "An Introduction to Analog and Digital communications", John Wiley and Sons, 1994.
R.B Carlson, "Communication Systems", MacGraw Hill.
George Kennedy, "Electrical Communication systems", Tata McGraw Hill 1993.
Roody Collin, "Electronics Communication", PHI
J. Millman and A Grabel, " Microelectronics" MacGraw Hill 1988.
Proakis J. J, "Digital Communications" Mc Graw Hill.
Digital Communications by TAUB Schilling

Electronic Communication Systems, Roy Blake Delmar, Thompson Learning

Introduction To telecommunications, Anu A Gokhale, Delmar Thompson Learning

4Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Should contain 5 demonstrations / hands on, assignments covering the syllabus

CLASS: B. Sc (Information Technology)			Semester - II	
SUBJECT: Professional Skill Development course				
Periods per week 1Period is 50 minutes	Lecture		5	
	TW/Tutorial/Practical		3	
		Hours	Marks	
Evaluation System	Theory Examination	3	100	
	TW/Tutorial/Practical	--	50	

i) Effective communication in Business, Importance and benefits of effective communication., Components of communication, The concepts and problems of communication, Non-verbal communication.

ii) Seven C's of Effective Communication, The Process of preparing Effective Business Messages.

iii) The Appearance and Design of Business messages, Business letters, Memorandums, Special time saving message media.

iv) Persuasive Written Business, Short Reports, Long (Formal) Reports, Strategies for Successful Speaking and Successful Listening, Strategies for Successful Informative and Persuasive Speaking., Strategies for successful interpersonal Communication, Strategies for successful Business and Group Meetings.

v) Activities: Communication Games, Report writing skills, Effective communication Skills, Technical Project Report preparation

vi) Issues of basic human Psychology and value system.

vii) Negotiation Skills

Reference

Communications in Organizations, Dalmar Fisher, Jaico Publishing House

Effective Business Communications, Herta A. Murphy, Herbert W. Hildebrandt & Jane P. Thomas, McGraw Hill

Report Writing for Business, Lesikar, Raymond, Richard D. Irwin Inc.

Business Communication: Strategies and Solutions, John W. Baird & James B. Stull, McGraw Hill

Tough Choices- Managers Talk Ethics, Toffler, Allied Publishers Pvt. Ltd.

Lateral Thinking, Edward De Bono, Penguin Books

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Industrial visits, mock GD, mock presentations / seminars

CLASS: B. Sc (Information technology)		Semester - II	
SUBJECT: Computer Graphics			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

i) Graphics

(a) Introduction, What is computer graphics? Elements of graphics workstation, Video Display Devices- Raster Scan Systems, Random Scan Systems, Input Devices, Graphics Software Coordinate Representations, Fundamental problems in Geometry

(b) Algorithms: Line drawing algorithms- DDA Algorithm, Bresenham's Line Algorithm, Frame Buffers, Circle and ellipse generating algorithms- Midpoint Circle Algorithm, Midpoint Ellipse Algorithm, Polynomials and spline curves, Filling- Filled Area Primitives, Scan-Line Polygon Fill Algorithm, Inside-Outside Tests, Scan-Line Fill of Curved Boundary Areas, Boundary-Fill Algorithm, Flood-Fill Algorithm, Character Generation, Attributes of lines, curves, filling, characters etc.

(c) Graphics Primitives, Primitive Operations, The Display-File Interpreter- Normalized Device Coordinates, Display-File Structure
Display-File Algorithms, Display Control, Polygons- Polygon Representation

(d) Attributes of Output Primitives, Line Attributes- Line Type, Line Width, Pen and Brush Options, Line Color, Color and Grayscale levels- Color Tables, Grayscale, Area-Fill Attributes- Fill Styles, Pattern Fill, Soft Fill, Character Attributes, Text Attributes

(e) Geometric Transformations: Matrices, Scaling Transformations- Sin and Cos Rotation, Homogeneous Coordinates and Translation, Coordinate Translations, Rotation about an arbitrary point, Inverse Transformations, Transformation Routines

(f) Two-Dimensional Viewing, The viewing pipeline, Viewing Coordinate Reference Frame, Window-to-viewport Coordinate Transformation, Two-Dimensional Viewing Functions, Clipping Operations- Point Clipping, Line Clipping, Cohen-Sutherland Line Clipping, Polygon Clipping, Sutherland-Hodgeman Polygon Clipping

(g) Three-Dimensional Concepts: Three-Dimensional Display Methods- Parallel

Projection, Perspective Projection, Visible Line and surface Identification, Surface Rendering, Three-Dimensional Object Representations- Bezier Curves and surfaces, B-Spline Curves and surfaces

(h) Visibility, Image and object precision, Z-buffer algorithm, Floating horizons

(i) Computer Animations, Design of Animation Sequences, General Computer Animation Functions- Raster Animations, Key-Frame Systems, Morphing, Simulating Accelerations, Motion Specifications, Kinematics and Dynamics.

Reference
Computer Graphics, Donald Hearn & M. Pauline Baker, Prientice Hall of India
Computer Graphics by Hill Jr
Computer Graphics, Steven Harrington, McGraw-Hill
Computer Graphics Principles and Practice, J.D. Foley, A. Van Dam, S.K. Feiner & R.L. Phillips, Addision Wesley
Principles of Interactive Computer Graphics, Willaim M. Newman, Robert F. Sproull, McGraw-Hill.
Introduction to Computer Graphics, J.D. Foley, A. Van Dam, S.K. Feiner, J.F. Hughes & R.L. Phillips, Addision Wesley
Computer Graphics by Rogers

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Should contain 5-7 programs development in C – Programming.

B.Sc. (INFORMATION TECHNOLOGY) SYALLABUS
SEMESTER – 3

SUBJECTS

Computational Mathematics

Systems Programming

Object oriented Programming

Computer Networks

Logic, Discrete Mathematical Structures

CLASS: B. Sc (Information technology)		**Semester - III**	
SUBJECT: Computational Mathematics			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction to Errors in Numerical Calculations: - Absolute Error, Relative Error, Percentage Error. Solution to Algebraic and Transcendental Equation: - Bisection Method, the Method of False Position, Newton-Raphson Method. Interpolation: - Forward Difference, Backward Difference, Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation. Least- Square Curve fitting: - Fitting a straight line, Parabola. Solution of simultaneous algebraic equations (linear): - Cramer's Rule, Gauss Elimination Method, Gauss Elimination with partial pivoting, Gauss-Jordan Method, Gauss-Seidel Method. Numerical solution of 1st and 2nd order differential equations: - Taylor series, Euler's Method, Modified Euler's Method, Runge-Kutta Method for 1st and 2nd Order Differential Equation, Picard's Method. Numerical integration: - Trapezoidal Rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule, Linear Programming: - Linear Programming Model and their Graphical Solutions. Transportation problems PERT/CPM.

Reference

S. S. Sastry, "Introductory Methods of Numerical Analysis" PHI

V. Rajaraman, "Computer Oriented Numerical Methods",   PHI

Mathews, "Numerical Methods for Scientist & Engineers" PHI

Taha, "Operations Research" PHI

Balguruswami, "Numerical Methods" TMH

Numerical Anaysis   Richard L Burden, J Douglas Faires, Brooks/cole, Thompson Learning

Numerical Methods for Engineers with programming and Software Applications, Steven C. Chapra, Raymond P. Canale, McGraw Hill International

Applied Numerical Methods For Engineers, Using Matlab and C Robert J Schilling

Sandra L Harris Brooks/cole, Thompson Learning

R. M. Baphana " Numerical Methods" Technova Publication

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical

C programming for Numerical methods

CLASS: B. Sc (Information technology)			Semester - III	
SUBJECT: Systems Programing				
Periods per week 1Period is 50 minutes		Lecture	5	
		TW/Tutorial/Practical	3	
			Hours	Marks
Evaluation System		Theory Examination	3	100
		TW/Tutorial/Practical	--	50

Unix Shell Programming

Unix Operating system Overview: Unix System Architecture, Operating system services

General Unix commands: Unix commands like ls , cp etc, Unix utilities like grep, wc etc.

Fundamentals of Unix shell programming: Functions, variables, special symbols, looping and decision making, test command, error checking in shell programming.

Introduction to "vi editor", Features, Use of various keys, and over all using vi editor for editing text.

Security in Unix : Password, Characteristic of good password, Files permissions , Directory permissions

Elementary Unix networking : Inter-system mail, ftp , telnet , uucp, cu, Basic network

topologies.

Introduction to AWK utility: command-line structure , flow control , built-in functions.

Unix C Programming

Introduction to gcc – C compiler, Compiling and Executing C – programs on UNIX platform.

Unix System Programming

System calls: Files related: File subsystem, File descriptor, File table, Inode, File Descriptor table, Inode table, Process related: Process, Process table, Child process, Mode of execution, Orphans, Pipes, Semaphores.

Reference

Working with Unix – Vijay Mukhi , BPB Publications

UNIX – The Complete Book, A guide for professional Users, Galgotia

Understanding Unix – A conceptual Guide, R.Groff & P.N. Weinberg,BPB

The UNIX Programming environment , Pike rob & Kerningham Brain W, Prentice Hall

UNIX training guide by Clifford Mould, Wheeler publications.

Operating Systems, William Stallings, Prentice-Hall of India pvt ltd

Operating Systems *Concepts and Design*Milan Milenkovic, TMG

Operating Systems Design and Implementation, Andrew S Tanenbaum, Albert S Woodhull, Prentice-Hall of India pvt ltd

Operating Systems with case studies in UNIX NETWARE, WINDOWS NT Achyut S Godbole, TMG

Term Work

Should contain at least 10 assignments covering the syllabus executed in the laboratory

Tutorial
Tutorial should contain 5 assignments

Practical

3 -5 programs on Shell Programing and 3-5 programs on C – Programming using UNIX / Linux / IRIX / Solaris

CLASS: B. Sc (Information technology)		Semester - III	
SUBJECT: Object Oriented Programing			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Modularity

Approaches to reusability

Towards object technology

Abstract data types

Object-oriented techniques

The static structure: classes

The run-time structure: objects

Memory management

Genericity

Design by Contract: Building reliable software

When the contract is broken: exception handling

Supporting mechanisms

Introduction to inheritance

Multiple inheritance

Inheritance techniques

Typing

Global objects and constants

Object-oriented methodology: applying the method well

On methodology

Design pattern: multi-panel interactive systems

Inheritance case study: "undo" in an interactive system

How to find the classes

Principles of class design

Using inheritance well

Useful techniques

A sense of style

Object-oriented analysis

The software construction process

Concurrency, distribution, client-server and the Internet

Object persistence and databases

Reference
OOP by Timothy Budd, TMG
OOP by Bahrami

Object Oriented programmimg using C++, E. Balaguruswamy, TMG

Object oriented Programming in C++, Nabajyoti Barkakati, Prentice-Hall of India pvt ltd

Object Oriented Programming Using C++, Joyce Farrell, Course Technology

Thompson Learning

Object oriented Modeling and design by James Rumbaugh, Prentice Hall Int.
Object oriented Analysis and Design by G. Booch

Term Work

Should contain at least 10 assignments covering the syllabus executed in the laboratory

Tutorial
Tutorial should contain 5 assignments

Practical
Case Study

CLASS: B. Sc (Information technology)		Semester - III	
SUBJECT: Computer Networks			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction: - History of Network Developments, Network Hardware, Network Software. Mode of transmission: - Asynchronous and Synchronous Transmission, Half and Full duplex Transmission, Concept of DTE and DCE, Concept of Intrefacing DTE and DCE. OSI Reference Model (7 Layers):- Functions of each OSI Model Layer. The Physical Layer: - Transmission media, Introduction to various Connections used in Network: - RJ 45, RS -232, etc. The Data Link Layer: - Stop – and – Wait Flow Control, Sliding – Window Flow Control, Error Detection, Cyclic Redundancy Check, Stop – and - Wait ARQ, Selective – Reject ARQ, High- level Data Link Control (HDLC) and its Operation, X.25 Protocol, Token bus and Token Ring. Multiplexing: TDM, TDM link control, Framing, Pulse Stuffing, FDM, Statistical TDM. Switching Concepts: Circuit Switching, Packet Switching: - Datagram Approach, Virtual Circuit Approach. The Network Layer: - Routing: - Characteristics, Performance Criteria, Decision time and place. Routing Strategies:- Alternate Routing, Adaptive Routing, Fixed Routing, Flooding. Congestion Control. The IP Protocol: - IP Addressing, Subnets, Internet Control Protocols. The TCP Protocol: - the TCP Segment Header, TCP Connection Management. The Application Layer: - DNS, SNMP. Introduction to Equipments used in Networking: - Bridges, Hubs, Switches, and Routers. Concepts of Network Security:- Encryption , Public Key, Digital Signature, Introduction to Other Technologies:- ATM, Frame Relay, ISDN, VSAT (Very Small Aperture Terminal) communication, Global positioning System (GPS).

Distributed Computing: - Fundamentals, What is Distributed Computing? Evolution of DCS, DC System Models, Advantages and Disadvantages of DCS, Comparison with Centralized OS.

Reference Books:

Stallings, "Data and Computer Communication", PHI,

Douglas E. Comer, "Computer Networks and Internets" 2nd ed, Addison Wesley,1999

Bertseakas and Galleger, "Data Networks" PHI

Scwartz, "Telecommunication Networks" Addison

Computer Networks, Andrew S. Tanenbaum, Prentice Hall of India
Understanding Data Communications and Networks, William A Shay, brooks/cole

Thompson Learning

Distributed Operating Systems, P.K. Sinha, IEEE Press
Distributed Operating Systems, Andrew S. Tanenbaum, Prentice Hall of India

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical

Case Study: Learn the Network design implemented in the Institutes Laboratory or any hypothetical Network and prepare a 15 – 20 pages report, with Network Diagram, and considerations for expansion of Network.

CLASS: B. Sc (Information technology)		Semester - III	
SUBJECT: Logic, Discrete Mathematical Structures			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Fundamentals - Sets and subsets, Operations on sets, Sequences, Division in the integers, Mathematical structures

Logic – Propositions and Logical operations, Conditional Statements, Methods of proof, mathematical induction

Counting – Permutations, Combinations, The pigeon hole principle, elements of probability, recurrence relations

Relations and Digraphs – Product sets and partitions, relations and digraphs, paths in relations and digraphs, properties of relations, equivalence relations, computer representation of relations and digraphs, manipulation of relations, Transitive closure and Warshall;s algorithm

Functions – Functions for computer science, permutation functions, growth of functions

Graph theory – Graphs, Euler paths and circuits, Hamiltonian paths and circuits, coloring graphs

Order relations and structures – Partially ordered sets, External elements of partially ordered sets, Lattices, Finite Boolean algebra, Functions on Boolean algebra, Boolean functions as Boolean polynomials

Trees – labeled trees, tree searching, Undirected trees, Minimal spanning trees

Semigroups and groups – Binary operations, semigroups, products and quotients of semigroups, groups, Products and quotients of groups

Languages and finite state machines – Languages, representation of special languages and grammars, Finite state machines, Semi groups , machines and languages, machines and regular languages

Groups and coding – Coding of binary information and error detection

Decoding and error correction

Reference

Discrete structures by B Kolman RC Busby, S Ross PHI Pvt. Ltd.

Discrete structures by Liu

Digital Logic John M Yarbrough   Brooks/cole, Thompson Learning
Discrete Mathematics and its Applications   Kenneth H. Rosen   TMG

Discrete Mathematics for computer scientists and Mathematicians, Joe L.Mott, Abraham Kandel Theodore P. Baker, Prentice-Hall of India pvt ltd

Discrete Mathematics With Applications, Susanna S. Epp, Books/Cole Publishing Company

Discrete Mathematilcs, Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson, TMG

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical

None

Semester IV

Data base concepts and Systems

Operating Systems

C++ and JAVA

E-Commerce

SW Engineering

CLASS: B. Sc (Information technology)			Semester - IV	
SUBJECT: Data base concepts and Systems				
Periods per week 1Period is 50 minutes	Lecture		5	
	TW/Tutorial/Practical		3	
			Hours	Marks
Evaluation System	Theory Examination		3	100
	TW/Tutorial/Practical		--	50

Introduction- Purpose of Database Systems, Views of data, Data Models, Database language, Transaction Management, Storage Management, Database Administrator, Database Users, Overall System Structure, Different types of Database Systems

E-R Model: Basic Concepts, Design Issues, Mapping Constraints, Keys, E-R Diagram, Weak Entity set, Extended E-R features, Design Of an E-R Database Schema, Reduction of an E-R schema to Tables

Relational Model: Structure of Relational Database, The Relational Algebra, The tuple relational calculus, The Domain Relational Calculus, Views

SQL- Background, Basic Structure, SET operations, Aggregate functions, Null Values, Nested Sub queries, Derived Relations, Views, Modification of Database, Joined Relations, DDL, Other SQL features

Transaction- Transaction Concepts, State, Implementations of Atomicity and durability, Concurrent Executions, Serializability, Recoverability, Transaction Definition in SQL.

Concurrency Control- Lock based protocol, Timestamp based protocol, Validation based protocol, Multiple Granularity, Multi version Schemes, Deadlock Handing, Insert and Delete operations, Concurrency in index structure

Query Optimization

Relational Database Design- Pitfalls in Relational-Database Design, Decomposition, Normalization Using Functional Dependencies, and Normalization Using Multi valued Dependencies, Normalization Using Join Dependencies, Domain-Key Normal Form and Alternative Approaches to Database Design

Other Relevant Advance Topics and Applications- Object Oriented Database, Decision-Support Systems, Data Analysis, Data Mining, Data Warehousing, Spatial and Geographic Databases, Multimedia Databases, Mobility and Personal Databases, Information-Retrieval Systems, Distributed Information Systems, The World Wide Web

ORACLE 8.0 Database: SQL, PL/SQL, Developer 2000(Oracle Forms and Reports)

Reference

Database Systems and Concepts, Henry F. Korth, Sliberschatz, Sudarshan, McGraw Hill

DBMS by Date

Fundamentals of Database Systems, Elmasri and Navathe

An Introduction to Database System, C.J. Date

Principles of Database System, Ullman, Galgotia Publications

Oracle : A Beginners Guide, Oracle press

Oracle Client Server Computing, BPB Publications

Object Oriented Database Management, Kemper and Moerkotte, Prientice Hall New Jersy

Object Oriented MultiDatabase System, Omran A. Bukhares & A.K Elmagarmid, Prentice Hall Inc. 1996

Computer Data-Base Organization, James Martin, Prentice-Hall of India pvt ltd
Concepts of Database Management, Phillip. J. Pratt, Joseph. J.Adamski, Course Technology

Database Management and Design, Gary W.Hansen, James V.Hansen, Prentice-Hall of India pvt ltd

Database Management Systems Raghu Ramakrishnan, Johannes Gehrke, Mc raw Hill International Edition

DataBase Systems, design Implementation and Management, Peter Robe Carlos, Coronel, Course Technology, Thompson Learning

Database Systems, Concepts ,Management & Applications   Alden C Lorents, James N Morgan, Harcourt Brace College Publishers

Database Systems Concepts, Abraham Siberschatz, Henry F.Korth, S. Sudarshan, Mc Graw Hill International Edition

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical

Case Study, & Assignments: One database application to be developed as a part of the course using any relevant database.

CLASS: B. Sc (Information technology)		Semester - IV	
SUBJECT: Operating Systems			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction to operating systems design and implementation.

Basics of operating systems, namely structure, concurrency, scheduling, synchronization, memory management, filesystems and networking.

Ubiquitous computing, security and extensible system architectures, Process Deadlock Distributed Operating Systems and Remote Procedure Calls, Theoretical Foundations Distributed Mutual Exclusion, Protection and Security, Cryptography, Database Operating Systems, Concurrency Control, System Performance

Reference

Modern Operating Systems by Tanenbaum

Network operating Systems by William Stallings

Operating systems by Silberschatz

Operating Systems *Concepts and Design*Milan Milenkovic, TMG

Operating Systems Design and Implementation, Andrew S Tanenbaum

Albert S Woodhull, Prentice-Hall of India pvt ltd

Operating Systems with case studies in UNIX NETWARE, WINDOWS NT Achyut S Godbole, TMG

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Should contain 5 demonstrations / hands on, assignments covering the syllabus using UNIX / Linux / Solaris / IRIX

CLASS: B. Sc (Information technology)		Semester - IV	
SUBJECT: C++ and JAVA			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

C++

C++ Fundamentals, Data types, Operators, Preprocessor directives, Declarations, Input & Output, control structures, functions and arrays.

Objects and Classes:

Structures and Classes, Unions and Classes, Data hiding and encapsulation, Private and public members, Member functions, Accessing class members, Objects as function parameters, Static data and member functions, friend functions and friend classes.

Object Initialization and Cleanup:

Constructors, Parameterized constructors, Destructor, Constructor overloading,

Constructors with default arguments, Constructors with dynamic operations

Function and Operator Overloading:

Function overloading, functions with default arguments, Inline functions, Unary operator overloading, Operator returning value, Binary operator overloading, Overloading arithmetic, relational and assignment operators.

Inheritance:

Derived and base class, protected members, Overriding functions, Private, protected and public inheritance, Derived class constructors, Levels of inheritance and multiple inheritance

Virtual Functions and Polymorphism:

Virtual Functions, Pure Virtual Functions, Abstract Classes, Using Virtual Functions, Early verses Late binding

Arrays, Pointers and References:

Array of Objects, Initialized and Uninitialized Arrays, Pointer to Object, "this" pointer, Pointer to derived types, Pointer to Class Member, Reference Parameters, Passing Reference to Objects, Returning References, Independent References, Dynamic Allocation Operators, Allocating Objects

Java - Data Types, variables, Arrays, Operators, Control Statements, Introducing Classes, Inheritance, Packages and Interfaces, Exception Handling, Multithreaded Programming, I/O Applets, String Handling, Exploring java.lang, Java.util, Java.I/O, Networking, The Applet Class, Event Handling

Reference

Programming in C++ by Balagurusamy TMH

Starting out with C++ by Tony Gaddis PENRAM International Publishing(India)

Complete JAVA reference by Patrick Naughton
JAVA Unleashed

Complete reference by Herbert shield TMH

Programming in C by Schuam out line series

Let us C++ by Yaswant Kanetkar BPB

Practical C++ Programing O'Reilly

Beginning C++, Ivor Horton

A first book of C++, Gary Bronson

Practical C++ programming, Steve Oualline Shroff Publishers

Teach Yourself C++   Herbert Schildt, TMG

Object Oriented design in c++ using STL, Nicholas J De Lillo, Brooks/Cole, Thompson Learning

Object Oriented programmimg using C++   E. Balaguruswamy   TMG

Object oriented Programming in C++, Nabajyoti Barkakati, Prentice-Hall of India pvt ltd

Object Oriented Programming Using C++, Joyce Farrell, Course Technology

Thompson Learning

Object oriented Programming with C++ and JAVA, D.Samantha   Prentice-Hall of India pvt ltd

Term Work

Should contain at least 15 assignments covering the syllabus executed in the laboratory

Tutorial
Tutorial should contain 5 assignments

Practical

C ++ and JAVA

CLASS: B. Sc (Information technology)		Semester - IV	
SUBJECT: SW Engineering			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

i) Introduction, What is software engineering?

ii) Software Development Life Cycle, Requirements Analysis, Software Design, Coding, Testing, Maintenance etc.

iii) Software Requirement Specification, Waterfall Model, Prototyping Model, Iterative Enhancement Model, Spiral Model, Role of Management in Software Development, Role of Metrics and Measurement, Problem Analysis, Requirement Specification, Validation, Metrics, Monitoring and Control.

iv) System Design, Problem Partitioning, Abstraction, Top-down and bottom-up design, Structured Approach, Functional v/s Object-Oriented Approach, Design specification & verification, metrics, Monitoring & Control

v) Coding, Top-down & Bottom-up, Structured Programming, Information Hiding, Programming Style, Internal Documentation, Verification, Metrics, monitoring & control

vi) Testing, Levels of Testing- Functional Testing, Structural Testing, Test Plan, Test Cases Specification, Reliability assessment.

vii) Software Project Management, Cost Estimation, Project Scheduling, Staffing, Software Configuration Management, Quality Assurance, Project Monitoring, Risk Management

Text Book

Software Engineering- A Practitioners Approach, R. Pressman, McGraw Hill

An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa

Reference:

Object Oriented Modelling and Design, J. Rumbaugh, M.Blaha, W. Premerlani, F. Eddy and W. Loresen, Prentice Hall of India

Fundamentals of Software Engineering, C.Ghezzi, M. Jazayeri and D. Mandrioli,

Prentice Hall of India

Software Engineering, S. L. Pfleeger, MacMillan

Software Engineering Concepts, Richard E. Fairley, TMG

Software Quality, Mordechai Ben-Menachemm, Garry S Marlis, Thompson Learning

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical

A group project is essential in a software engineering course. The focus of the project is not to get a lot of code written, but to have a complete working system developed, using proper planning and life cycle. The best way to select a project is to have the students work on some real problems. This is the only way they can get an idea of how to do requirements analysis. The main emphasis of this course is to make students realize the importance of maintaining proper documents such as requirements specification, design, test plan, overall plan etc.

CLASS: B. Sc (Information technology)		Semester - IV	
SUBJECT: E-Commerce			
Periods per week 1Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Introduction, IT and business, E-commerce: Concepts

Electronic Communication, PCs and Networking, E-mail, Internet and intranets. EDI to E-commerce, EDI, UN/EDIFACT

Concerns for E-commerce Growth, Internet bandwidth, Technical issues, Security issues. India E-commerce Readiness, Legal issues, Getting started.

Security Technologies: Cryptography, Public Key Algorithms, Private Key Algorithms, Hashing techniques, Certification and key Distribution, Cryptographic Applications, Encryption, Digital Signature

Protocols for Transactions. SSL-Secure Socket Layer, SET-Secure Electronic Transaction, Credit Card Business

Electronic Commerce providers. CyberCash, Digicash, VeriSign

Software Package: PGP e-mail encryption software. EDI software developed by NIC for Customs

Text Book

E-Commerce: The Cutting Edge of Business, Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill

Reference

Cyber Law and E –Commerce, David Baumer, J C Poindexter, TMG

Cyberlaw Simplified   Vivek Sood, TMG

e- Commerce Strategy , Technologies and Applications, David Whiteley, McGraw Hill International

E- Security, Electronic Authentication and Information Systems Security Sundeep Oberoi, TMG

E-Commerce Strategies, Charles Trepper   Prentice-Hall of India pvt ltd

Electronic Commerce, Gary P Schneider, James T Perry, Course Technology
Thompson Learning

Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial
Tutorial should contain 5 assignments

Practical
Case Study

Semester 5

Internet Security

Visual Basic 6

SQL 2

Elective I (Select one of following)

Multimedia

Embedded Systems and Programming

Web Design and Internet based applications

Advanced Java

Elective II (Select one of following)

ERP Systems

GIS

Management Information systems

BPR

Semester 6

C# (pronounced as C Sharp)

Internet Technologies

CRM

<u>Elective III (Select one of following)</u>
Strategic IT Management
Total supply chain Management

Project management

IT Laws and Patents

Project

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Internet Security			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1)Introduction

Why require a security ? Picking a Security Policy , Strategies for a Secure Network , The Ethics of Computer Security, Security Threats and levels, Security Plan (RFC 2196)

2) Classes of Attack

Stealing Passwords.
Social Engineering.
Bugs and Backdoors.
Authentication Failures.
Protocol Failures.
Information Leakage.
Exponential Attacks—Viruses and Worms.
Denial-of-Service Attacks.
Botnets.
Active Attacks

3) Computer Security

What are viruse, Trojan Horse, Worms? How to protect the computer against virus

What is the Structure of viruse?

4) Firewalls and Proxy Servers

Kinds of Firewalls.

Packet Filters.
Application-Level Filtering.
Circuit-Level Gateways.
Dynamic Packet Filters.
Distributed Firewalls.
What Firewalls Cannot Do

Filtering Services.

Reasonable Services to Filter.

Digging for Worms.

Packet Filtering

Implementing policies (Default allow , Default Deny) on proxy

5) Cryptography

Introduction to Basic encryption and Decryption,

Diffie – Hellman Key Exchange

Concept of Public key and Private key

Digital Signatures

Refrence

Firewalls and Internet Security: Repelling the Wily Hacker , Second Edition Addison – Wessly

Tutorial / Test

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment from the syllabus

Case Study: Study a medium – scale implementation of security system and submit report. (e.g. Implementing firewall, Implementing proxy server for accessing internet, Implementing access policies, etc)

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Visual Basic 6.0			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction to Visual Basic

Introduction Graphical User Interface (GUI), Programming Language (Procedural, Object Oriented, Event Driven), The Visual Basic Environment, How to use VB complier to compile / debug and run the programs.

2) Introduction to VB Controls

Textboxes, Frames, Check Boxes , Option Buttons, Images, Setting a Border & Styles, The Shape Control, The line Control, Working with multiple controls and their properties, Designing the User Interface, Keyboard access, tab controls, Default & Cancel property, Coding for controls.

3) Variables, Constants, and Calculations

Variables, Variables Public, Private, Static, Constants, Data Types, Naming rules/conventions, Constants, Named & intrinsic, Declaring variables, Scope of variables, Val Function, Arithmetic Operations, Formatting Data.

4) Decision & Conditions

If Statement, If –then-else Statement, Comparing Strings, Compound Conditions(And, Or, Not), Nested If Statements, Case Structure ,Using If statements with Option Buttons & Check Boxes, Displaying Message in Message Box, Testing whether Input is valid or not.

Using Call Statement to call a procedure.

5) Menus, Sub-Procedures and Sub-functions

Defining / Creating and Modifying a Menu, Using common dialog box, Creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, Writing a Function Procedure,

6) Multiple Forms

Creating , adding, removing Forms in project, Hide, Show Method, Load, Unload Statement, Me Keyword, Referring to Objects on a Different Forms,

7) List, Loops and Printing

List Boxes & Combo Boxes, Filling the List using Property window / AddItem Method, Clear Method, List box Properties, Removing an item from a list, List Box/ Combo Box, Do/Loops, For/Next Loops, Using MsgBox Function, Using String Function, Printing to printer using Print Method,

8) Arrays

Single-Dimension Arrays, Initializing an Array using for Each, User-Defined Data Types, Accessing Information with User-Defined Data Types, Using List Boxes with Array, Two dimensional arrays.

9) OOP in VB

Classes, Creating a new Class, Creating a new object using a class, choosing when to create New Objects, The Initialize & Terminate events.

10) Data Files

Opening and Closing Data Files, The Free File Function, Viewing the data in a file, Sequential File Organization (Writing Data to a sequential Disk File, Creating a sequential data file, Reading the Data in a sequential file, Finding the end of a Data file, Locating a file). Trapping Program Errors, The Err Object, Random Data File Opening a random file, Reading and writing a random file(Get, Put, LOF, Seek).

11) Accessing Database File

Creating the database files for use by Visual Basic (Using MS-Access), Using the Data Control ,setting its property, Using Data Control with forms, navigating the database in code (the recordset object using the movenext, movepreviouse, movefirst & movelast methods , checking for BOF & EOF, using listboxes & comboboxes as data bound controls, updating a database file (adding, deleting records) .

12) Advanced data handling

Displaying data in grids (grid control, properties of grid) , displaying the record no & record count, opening the database, validation & error trappings (locking text boxes, trap errors with On Error, file open errors) , Recordset , searching for a specific record (findfirst, findnext, findlast, findprevious,) , seek method, working with database fields, creating a new dynaset.

Reference:

    i)   Programming in VB 6 by Julia case Bradley , Anita C. Millspaugh, TMH

    ii)   Visual Basic 6.0 Programming by Content Development Group, TMH

    iii)   The Complete Reference Visual Basic 6 by Noel Jerke , TMH

Term Work

 Practical: At least 8 practicals must be conducted on the topics from the syllabus

Tutorial / Test

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment from the syllabus

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: SQL 2			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction to SQL: The SQL language, role of SQL, SQL features & benefits
Microsoft commitment (ODBC & ADO) , Internet database access , Java integration (JDBC))

2) SQL & DBMS: Brief history of SQL , SQL Standards (ANSI / ISO Standards, other SQL standards, ODBC & the SQL access group) , SQL & networking (centralized architecture, file server architecture , client/server architecture, multi-tier architecture)

3) RDBMS: Data models (File management systems, hierarchical databases, network databases), relational data model (Keys, tables, relationships), Codd's 12 rules

4) SQL Basics: statements, names (table & column names), data types , constants
(numeric, string, date & time, symbolic constants), expressions , built-in functions, missing data (NULL values)

5) Simple queries: The SELECT statement , query results, simple queries, duplicate rows, row selection, search conditions, sorting query results, rules for single table query processing

6) Multi-table queries : Simple joins , Non equi-joins, SQL considerations for multi table queries (table aliases, qualified column names, all column selections , self joins) , multi table query performance , the structure of the join (table multiplication, rules for multi-table query processing) , outer joins

7) Summary Queries : column functions, grouped queries, group search conditions

8) Sub queries & query expressions : using sub queries, sub query search conditions, sub queries & joins, nested sub queries , correlated sub queries, sub queries in the HAVING clause, advanced queries in SQL2 .

9) Database updates : adding data to the database , deleting data from the database, modifying data in the database

10) Data integrity : meaning of data integrity, required data, simple validity checking (column check constraints, domains), entity integrity (other uniqueness constraints, uniqueness & NULL values) , referential integrity (referential integrity problems, delete & update rules, cascaded deletes & updates, referential cycles, foreign keys & NULL values) , trigger advantages & disadvantages, triggers & SQL standards

11) Transaction Processing : Meaning (COMMIT, ROLLBACK), transaction log, transaction & multi user processing, locking (locking levels, shared & exclusive locks, deadlocks, advanced locking techniques)

12) Creating a database : DDL, creating database , table definitions, constraint definition, aliases & synonyms, indexes, managing other database objects, database structures (single database architecture, multi- database architecture, multi-location database architecture)

13) Views : meaning, creating a view (horizontal, vertical, row/column subset, grouped , joined views), updating a view, dropping a view

14) SQL security : SQL security concepts (user-ids, security objects, privileges) , views & SQL security, granting privileges , revoking privileges

References :

    (i)   The complete reference SQL by James R. Groff & Paul N. Weinberg TMG
    (ii)   SQL a complete reference by Alexis Leon & Mathews Leon TMG

Term Work:

Practical

Should contain at least 8 Practical from the Syllabus

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

<u>Elective I (Select one of following)</u>

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Multimedia			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction, What is multimedia? Components, Applications: presentation, profiles, CBTs, Conferencing etc, Issues concerning problems of transfer of data on networks due to stream orientation, Quality of services and synchronization .

2) Multimedia Elements: Analog and digital signals, Sampling and quantization, Color space/models, List of media elements Types of texts, attributes and preparation, graphic types, File formats for vector and raster graphics, Tools and processes for preparing graphical elements, Animation types and techniques and tools for preparation, Video standards, Compression techniques , file formats, Tool and process of preparing video

3) Integration and Authoring, Process of integration

4) Developing multimedia package, Content analysis for different applications, Story boarding, Media design, Integration and packaging

5) Coding and Compression, Entropy encoding-run-length, Repetition suppression, Pattern substitution, Hoffman etc, Source Encoding- Transform and differential encoding, JPEG compression process, Trade off between compression and picture quality, MPEG audio and video compression, MPEG-2 Standards, Various CD Formats.

Reference

Communication and Computing for Distributed Multimedia Systems,Guojun Lu, Artech House

Optimizing your Multimedia PC, L.J. Skibbe, S. Hafemeiseter, A.M. Chesnut, Comdex Computer Publishing

Multimedia Madness, RonWodaski, SAMS Publishing

Inside 3 D Studio Max, S. Ellioitt & Phillip Miller, Techmedia

Byte Guide to CD -Rom, Michael Nadean, Osborne McGraw Hill

3-D Graphics and Animation, Mark Giambruno, Techmedia

Multimedia: Making It Work, Tay Vaughan, Osborne McGraw Hill

Multimedia Systems,J.E.K Budford, Addision Wesley

Multimedia Systems Design, P.K. Andleigh , K Thakar, Prentice hall of India

Multimedia Systems, S.K. Tripathi, S.V. Raghvan

Tutorial
There should be 3 tutorials or class test

Assignments
Should contain 4 assignment

Case Study : Students are required to collect the information about the development in multimedia. A 5 – 10 page report has to be submitted on any topics related to multimedia. (E.g CD Mastering Techniques, CD printing, MPEG – Encoding, DVD Fabrication, DVD Mastering, Digital Synthesizer, 3-D Animation used in films etc)

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Embedded Systems and Programming			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction : Introduction to embedded system?, Variations on the theme, C : The least common denominator , Introduction to about hardware

2) What are real-time embedded systems, examples of real time embedded systems.

3) Introduction to embedded program ,The role of the infinite loop

4) Compiling, linking and locating, the Build Process.

5) Memory : Types of memory, Memory testing, Validating memory contents, working with Flash Memory

6)Peripherals: Control and status Registers, The device driver philosophy, A simple timer driver.

7) Operating Systems: History and Purpose, a decent embedded operating system, real-time characteristics, Selection process

References:

Programming Embedded systems in C and C++, O'reilly, SPD metrowreks.com

http://www.ece.cmu.edu/~koopman/iccd96/iccd96.html

Tutorial
There should be 3 tutorials or class test

Assignments
Should contain 4 assignment

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Web Design and Internet based Application			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

Introduction to HTML/ DHTML:

1) Introduction to HTML/X-HTML: Document types(HTML elements, head elements, title & body element), element & character, the rules of HTML& X-HTML.

2) Core HTML attributes: ID attribute, class attribute, style attribute, title core language attribute, core events, heading, paragraphs & breaks, divisions & catering , spans , quotations, preformatted text, list (ordered, unordered, definition list) , horizontal rules, address (other block level element) , text level element , physical character formatting element, logical elements, inserted & deleted text, character entities, comments.

3) Links & addressing : basic concepts of URLs, linking in HTML (The anchor element , link rendering), anchor attribute , name attribute , title , accelerator keys, tab index, target , anchor & link relationship, image & anchor, image maps (client & server side & their attributes)

4) Layouts with tables : introduction to tables (simple table, row span, colspan attribute, background color, background images, data binding : tables generated from data source)

5) Frames: overview of frames, simple frame, use of <noframes> , frame layouts.

6) Using Forms to read the input from user.

Introduction to ASP

1)Introduction: what are Active Server Pages, how they work, understanding ASP objects and components, running ASP pages - setting up PWS/ IIS, creating your first ASP page, understanding ASP scripts.

2)Working with variables: data types- integer, float, string, etc. VBScript operators, conditional statements - if..then, if..then..else, elseif, select case, looping logic - Do, Do While, Do until, While…Wend, for…next, for each…next, sub.. endsub

3)Request and Response objects:

 Response object - buffering page, page caching,

 Request object - QueryString collection, form collection, servervariables collection, Working with HTML forms - retrieving form data, using text boxes, text areas, radio buttons, check boxes, select lists, form validation.

4)Session and Application Object:

 Application object - global.asa file, creating and reading application variable

 Session object - introduction, storing session information, contents & identifying

 session, controlling when session ends, cookies - working, creating and reading.

5)Active server pages with Databases:

Connections and Data sources - creating connections with OLE DB & ODBC, connecting to SQL Server with OLE DB & ODBC, closing an open connection Executing SQL statement with connection object - creating, inserting, updating, deleting, selecting a database table, advanced methods and properties

6)Working with Recordsets

 Retrieving a recordset, recordset fields, recordset cursor and locking types, Advanced methods & properties of recordset object - record count, scrolling, paging

References:

A Begginers Guide to HTML, TMH

ASP Unleashed 2.0, Sams Techmedia

ASP 3 .0 in 21 days, Sams Techmedia

Discover ASP 3.0 by Jude D'Souza, Monica D'Souza, TMH

ASP 3.0, A Beginner's Guide by Dave Mercer, TMH

Term Work:

Project: Develop a small projects relate to Web

(e.g. small website, guest book , small shopping cart with limited functionality etc)

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

Project: Develop a small website or small shopping cart with limited functionality.

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: Advanced Java			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction to Swing

Japplet, Icons and Labels , Text Fields, Buttons, Jbutton Class, Check Box, Radio Buttons, The Container, Panel, Window, and Frame Classes , Combo Box, Tabbed Panes, Scroll Panes, Trees, Tables, Custom Rendering of JList Cells,

2) JDBC

    i)   JDBC Fundamentals
    ii)   Establishing Connectivity and working with connection interface
    iii)   Working with statements
    iv)   Creating and Executing SQL statements
    v)   Working with ResultSet Object & ResultSetMetaData

3) Servlets

    i)   Introduction to Servlets (Life cycle of Servelet, Java Servlet Development Kit, Creating, Compiling and running servelet)
    ii)   The servelet API : javax.servlet package
    iii)   Reading the Servlet Parameters , Reading Initialization parameter
    iv)   The javax.servlet.http.Package
    v)   Handling HTTP Request and Response (GET / POST Request)

      vi)   Using Cookies, Session Tracking

4) Introduction to Java Beans
      i)   What is Java Bean? , Advantage
      ii)   Installing / Starting / Using BDK (Bean Development Kit)
      iii)   JAR Files
      iv)   Using the Java Beans API

5) JSP
      i)   Advantage of JSP Technology (Comparison with ASP / Servlet)
      ii)   JSP Architecture , JSP Access Model
      iii)   JSP Syntax Basic (Directives, Declarations, Expression, Scriplets, Comments)
      iv)   JSP Implicit Object , Object Scope
      v)   Synchronization Issue
      vi)   Exception Handling
      vii)   Session Management

References

The Complete Reference JAVA 2 , Herbert Schildt, TMH

The Complete Guide to JAVA Database Programming, Matthew Siple, TMH

http://java.sun.com

Practical

Should contain at least 8 Practical from the Syllabus

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: ERP Systems			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1)Introduction to ERP. Evolution of ERP. What is ERP? Reasons for the growth of ERP, Scenario and Justification of ERP in India, Evaluation of ERP, Various modules of ERP, Advantages of ERP

2) An overview of Enterprise, Integrated Management Information, Business Modeling, ERP for Small Business, ERP for Make to Order Companies, Business Process Mapping for ERP Module Design, Hardware Environment and its Selection for ERP Implementation

3) ERP and Related Technologies, Business Process Reengineering (BPR), Management Information System (MIS), Executive Information System (EIS), Decision Support System (DSS), Supply Chain Management (SCM)

4) ERP Modules, Introduction, Finance, Plant Maintenance, Quality Management, Materials Management

5) ERP Market. Introduction, SAP AG, Baan Company, Oracle Corporation, People Soft, JD Edwards World Solutions Company, System Software Associates, Inc. (SSA), QAD, A Comparative Assessment and Selection of ERP Packages and Modules

6) ERP Implementation Lifecycle, Issues in implementing ERP packages, Pre-evaluation Screening, Package Evaluation, Project Planning Phase, Gap Analysis, Reengineering, Configuration, Implementation, Team Training, Testing, Going Live, End-user Training, Post-implementation (Maintenance mode)

7) Vendors, Consultants and Users, In-house Implementation-Pros and Cons, Vendors, Consultants, End- users

8) Future Directions in ERP, New Markets, New Channels, Faster Implementation Methodologies, Business Models and BAPIs, Convergence on Windows NT, Application Platforms, New Business Segments, More Features, Web Enabling, Market Snapshot

References:

ERP- A Managerial Perspective, S. Sadagopan, Tata McGraw Hill

Enterprise Resource Planning, Alex Leon, Tata McGraw Hill

User Manuals of SAP R/3

User Manuals of BAAN VI

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

Case Study: Study a medium – scale implementation of ERP system in a industry and present a report of 10 – 15 pages.

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: GIS (Geographic Information system)			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1. BUILDING BLOCKS OF GEOGRAPHIC INFORMATION.

Measurement Basics.

Measurement Frameworks.

Representation.

2. TRANSFORMATIONS AND OPERATIONS.

Attribute-based Operations.

Overlay: Integration of Disparate Sources.

Distance Transformations.

Surfaces and Near Neighbors.

Comprehensive Operations.

Transformations.

3. THE BROADER CONTEXT.

Evaluation and Implementation.

Social and Institutional Context.

Reference

Fundamentals of GIS Michel Demers

Exploring GIS Nicholas Chrisman

GIS means Business by Christian Hardar
ESRI guide to GIS analysis Vol I by Andy Mitchell

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 7 assignment

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: MIS (Management Information system)			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction : MIS concept, definition, role of MIS, impact of MIS, MIS & computer, MIS & academics, MIS & user.

2) Role & importance of management : introduction to management , approaches to management , functions of the manager, managers & the environment, management as a control system, management by exception, MIS : a support to the management .

3) Process of management : management effectiveness, planning, organizing , staffing, coordinating & directing, controlling, MIS : a tool for management process.

4) Organization structure & theory : Basic model of organization structure, modifications of the basic model of organization structure, organization behavior, organization as a system, MIS : organization.

5) Strategic management of business : the concept of corporate planning, essentiality of strategic planning, development of the business strategies, types of strategies, short range planning, tools of planning, MIS : business planning.

6) Decision making : decision making concepts, decision methods, tools, & procedures, behavioral concepts in decision making, organizational decision making , MIS & decision making concepts.

7) Information : Information concepts, information : a quality product, classification of the information, methods of data & information collection, value of the information, general model of a human as an information processor, organization & information, MIS & the information concepts.

8) Systems : System concepts, systems control, types of system, handling

system complexity, post implementation problems in a system, MIS & system concepts.

9) System Analysis & design : Introduction , the need for system analysis, system analysis of the existing system, system analysis of new requirement, system development model, structured System analysis & design, computer system design, MIS & system analysis.

10) Development of MIS : development of long range plans of the MIS, ascertaining the class of information, determining the information requirement, development & implementation of the MIS, management of quality in the MIS, organization for development of the MIS, MIS : the factors of success & failure.

11) Choice of Information Technology : Nature of IT decision, strategic decision, configuration design, evaluation, information technology implementation plan, choice of 'information technology' & the 'MIS'

12) Technology of information systems : introduction, data processing   , transaction processing , application processing, information system processing, human factors & user interface, real time systems & design, programming languages for system coding, case tools & I -case.

Reference :

(i)   Management Information System by W. S. Jawadekar TMG
(ii)   Management Information System by James A. O'Brien TMG

Term Work

Case Study : Present a report of 10 – 15 pages on any topics from syllabus. (e.g.The student has to analysis the requirement and possibilities of implement MIS for his institution.)

Tutorial
There should be 3 tutorials or class test

Assignments
Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - V	
SUBJECT: BPR (Business Process Reengineering)			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) What is BPR

2) Considerations in BPR

3) TQM

4) SW available for BPR

5) How to Plan Your Project, Select the Right Team, and Choose Your Approach

6) Articulate the business issues driving the project

7) Clearly define your project's objectives

8) Gain buy-in from key business leaders

9) Define the project scope

10) Create a powerful team

11) Choose your reengineering steps

12) Select and work with consultants

13) Prepare a project budget

14) Project Planning Template and Guidelines

15) Reengineering Team Selection Criteria and Approach

16) Methodology Selection

17) Consultant Selection

18) Project Readiness Assessment

Reference

Reengineering the Corporation - A Manifesto for Business Revolution by Michael Hammer and James Champy.

Reengineering for Results: Keys To Success From Government Experience, Dr. Sharon L. Caudle; National Academy of Public Administration; Aug 94; on line text

Business Process Improvement

The Breakthrough Strategy For Total Quality, Productivity, And Competitiveness, H. James Harrington

The Change Management Toolkit for Reengineering
For companies and individuals involved in reengineering and represents a practical approach to the management of change in any organization - from Holland and Davis, WorthingBrighton Press.

Competing for the Future, Gary Hamel and C.K. Prahalad; book review and ordering info.

Deming Management Method, TheMary Walton; Perigee Books, Book review

Best Practices In Reengineering, McGraw-Hill, New York, NY, 1995 by David K. Carr and Henry J. Johansson, Coopers and Lybrand

Managing the Change Process: A Field Book for Change Agents, Team, Leaders and Reengineering Managers; David K. Carr,Kelvin J. Hard,William J. Trahant

New Tools For New Times: The Workflow Paradigm, Second Edition, WARIA Book Review on line, http://www.waria.com/waria/fischer.html

Process Innovation: Reengineering Work Through Information Technology, Thomas Davenport; Harvard Business School Press

Reengineering Revolution, A Handbook (The) HarperCollins Publishers, Inc. , New York, 1995, Michael Hammer and Steven A. Stanton; Book Review Only

The Wisdom of Teams : Creating the High-Performance Organization, Jon R. Katzenbach Douglas K. Smith

Winning With Quality: Applying Quality Principles In Product Development, John W. Wesner, Jeffrey M. Hiatt, and David C. Trimble

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

Semester 6

C# (pronounced as C Sharp)

Internet Technologies

CRM

Elective III (Select one of following)
Strategic IT Management
Total supply chain Management

Project management

IT Laws and Patents

Decision support and expert systems

Project

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: C# (pronounced as C Sharp)			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction to C# : Evaluation of C# , characteristics of C# , applications of C# , difference between C++ & C#, Difference between JAVA & C#.

2) Introduction to C# environment : the .NET strategy , the origins of the .NET technology, the .NET framework, the common language runtime , framework base classes, user & program interfaces, Visual Studio .NET , .NET languages, benefits of the .NET approach, C# & .NET

3) Overview of C# : Programming structure of C# , editing, compiling & executing C# programs, namespace, comments, using aliases for namespace classes, using command line argument, maths function.

4) Literals , variables & data types : literals, variables, data types, value types, reference type, declaration of variables, initialization of variables, default values, constant variables, scope of variables, boxing & unboxing.

5) Operators & expressions : arithmetic operators, relational operators, logical operators, assignment operators, increment & decrement operators, conditional operator, Bitwise operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators , type conversions, operator precedence & associativity, mathematical functions.

6) Decision making & branching : if statement, if …else statement, nesting of if… else statement, the else if ladder, switch statement, the ?: operator.

7) Decision making & looping : while statement, do statement, for statement, foreach statement, jumps in loops.

8) Methods in C# : declaring methods, the main method, invoking methods, nesting of methods, method parameters, pass by value, pass by reference,

the output parameters, variable arguments list, method overloading.

9) Arrays : 1-D array, creating an array, 2-D arrays, variable size arrays, the system. array class, ArrayList class.

10) String Handling: Creating strings, strings methods, inserting strings using systems, comparing strings, finding substrings, mutable strings, arrays of strings, regular expressions.

11) Structures & enumeration : structures, structs with methods, nested structs, differences between classes & structs, enumerations, enumerator initialization, enumerator base types, enumerator type conversion, common programming errors.

12) Classes & objects: Basic principles of OOP's , class, objects, constructors, static members, static constructors, private constructors, copy constructors, destructors, member initialization, the this reference, nesting of classes, constant members, read only members, properties, indexers.

13) Inheritance & polymorphism : classical inheritance, containment inheritance, defining a subclass, visibility control, defining subclass constructors, multilevel inheritance, hierarchical inheritance, overriding methods, hiding methods, abstract classes, abstract methods, sealed classes: Preventing inheritance, sealed methods, polymorphism.

14) Interfaces : Multiple inheritance : defining an interface, extending an interface, implementing interfaces, interfaces & inheritance, explicit interface implementation, abstract class & interfaces.

15) Operator overloading : Overloadable operators, need for Operator overloading, defining Operator overloading, overloading unary operators, overloading binary Operator, overloading comparison Operators.

16) Delegates & events : Delegates , Delegate declaration, Delegate methods, Delegates instantiation, Delegates invocation, using Delegates, multicast Delegates, events.

17) Managing console I/O operations : console class, console input, console output, formatted output, numeric formatting, standard numeric format, custom numeric format.

18) Managing errors & exceptions : types of errors, exceptions, syntax of exception handling code, multiple catch statement, the exception hierarchy ,

general catch handler, using final statement, nested try blocks, throwing our own exceptions, checked & unchecked operators, using exceptions for debugging.

References

(i)   Programming in C# by E. Balagurusamy TMH

(ii)   C# a beginner's guide by Herbert Schildt TMH

Practical

Should contain at least 8 Practical from the Syllabus

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: Internet Technologies			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Basic Networking:
- i)   Network Protocols :
  - a) TCP / IP (Transmission Control / Internet protocol)
  - b) ARP (Address Resolution Protocol)
  - c) RARP (Reverse Address Resolution Protocol)
  - d) RIP (Routing Information Protocol)
  - e) OSPF (Open Shortest Path First) Protocol
  - f)   BGP (Border Gateway Protocol)

2) Introduction to Network Programming
- i) Socket Programming (using TCP and UDP socket)
- ii) RMI
  - a) Introduction to Distributed Computing with RMI
  - b) RMI Architecture
  - c) Naming remote Object
  - d) Using RMI : Interfaces , Implementations, Stub, Skeleton, Host Server Client, Running RMI Systems
  - e) Parameters in RMI : Primitive, Object, Remote Object
  - f) RMI Client –side Callbacks
  - g) Distributing & Installing RMI Software

- iii) Introduction to CORBA

  - a) What is CORBA?
  - b) CORBA Architecture
  - c) Comparison between RMI and CORBA

3) Introduction to Wireless LAN
  - i)   How does WLAN work?
  - ii)   WLAN setups (Ad-hoc, infracture LAN)
  - iii) Use of WLAN
  - iv)   Benefits of WLAN
  - v)   Restrictions and Problems with WLAN

Refrences

http://www.ietf.org , Various RFC's and articles

RFC 1010 – ARP

RFC 1058 – RIP

RFC 1131 – OSPF

RFC 1105 – BGP

http://java.sun.com , for RMI and CORBA tutorials.

http://keskus.hut.fi/opetus/s38118/s00/tyot/25/ for wireless LAN

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

Case Study or Project : Present a report of 10 – 15 pages on any topics from syllabus.

e.g. Project could be on RMI implementation

Case Study could be based on Understanding development in Internet Technologies. A student would be required to submit 10 –20 pages report.

e.g.(Understanding wireless LAN, Mobile , Ipv6 Addressing Architecture, Ipv6 Implementation, Basic Mobile Computing, etc)

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: CRM (Customer Relations Management)			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1. Introduction to CRM : what is a customer? How do we define CRM? CRM technology, CRM technology components, customer life style, customer interaction.

2. Introduction to eCRM : difference between CRM & eCRM, features of eCRM.

3. Sales Force Automation(SFA) : definition & need of SFA, barriers to successful SFA, SFA:functionality , technological aspect of SFA: data synchronization , flexibility & performance , reporting tools.

4. Enterprise Marketing Automation (EMA) : components of EMA, marketing camping, camping, planning & management, business analytic tools. ,EMA components(promotions ,events , loyalty & retention programs), response management.

5. Call Centers Mean Customer Interaction: the functionality, technological implementation, what is ACD(automatic call distribution),IVR(interactive voice response), CTI(computer telephony integration),web enabling the call center, automated intelligent call routing, logging & monitoring.

6. Implementing CRM: pre implementation, kick off meeting, requirements gathering, prototyping & detailed proposal generation, development of customization, Power User Beta Test & Data import, training, roll out & system hand off, ongoing support , system optimization, follow up.

7. Introduction to ASP(application service provider): who are ASP's?, their role & function, advantages & disadvantages of implementing ASP.

References:

1.CRM at the speed of light by Paul Greenberg,TMH.

2. Customer R elations Management by Kristin Anderson & Carol Kerr. TMH.

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

Case Study: Present a report of 10 – 15 pages on any topics from syllabus.

Elective III (Select one of following)

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: Strategic IT Management			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

i) Changing Paradigm and Strategic Learning

ii) Changing face of Strategic Thinking: Strategic Management Paradigm, Emergent strategy, Strategic flexibility.

(1) Readings: Getting off the Treadmill. & Exploring Framework of Strategic Flexibility & Managing for Strategic Flexibility. Cases: The Global Computer Industry and APPLE.

iii) Changing Strategic Situation: paradoxes, complexity, chaos, turbulence, and uncertainty.

(1) Readings: Crafting Strategy in New Environment. & In search of New Strategy Paradigms - A Survey of Emerging Thoughts. With Case study.

iv) Special models and tools of strategic management. Strategy making as a journey.

(1) Readings: Meta-strategy: The new Strategic Management. & The challenge: Turning Turmoil into Customer Centered Growth. & The Journey of Strategy Making. With Case study

(2) Building Core Competence and Strategic Capability, Culture and stake-holder expectation.

(1) Readings: Competence based Strategic Management. Cases: Indian Cases on Core Competence.

vi) Globalization Strategy, Strategy of Transnational Corporations.

(1) Readings: Do you really have a global strategy? & Global Strategy in a World of Nations.

(2) Presentations: Global Strategy of Select Corporations/Industries.

vii) Strategy Evolution and Alliances.

viii) Strategic Intent and Architecture. With Case study

ix) Strategic Alliances and Joint Ventures. Readings: The Global Logic of Strategic Alliances & Collaborate with your Competitors and win. Presentations: Analysis of Strategic Alliances and Joint Ventures.

x) Mergers and Acquisitions. Presentations: Analysis on mergers and Acquisitions.

xi) Screening Strategic Options. Cases: Swiss Air Alliances With Case study

xii) Comparative Strategies and Strategic profile of Indian Business Houses.

(1) Readings: Are Private Basic Telecom Projects Viable in India? Presentations: Entry in Indian market from various Regions: US/Europe/Japan/SE Asia.

xiii) Strategy Implementation and Change Management. Corporate Restructuring.

(1) Cases: ABB Operationalizing Strategy: Policies, Budgets, Support Systems, and Rewards.

(2) Cases: ALIP: Entering Indian Market. Issues of culture and leadership in strategy implementation, Corporate Governance. With Case study

xiv) Managing Strategic Change and Transformation.

xv) Functional Strategies/ Tactics: Marketing, Finance, HR, R&D.

Reference:

(a) Strategic Management: Formulation, Implementation and Control, Pearce II,J.A. and Robinson R.B., Irwin

(b) Strategic Management and Business Policy: Entering 21st Century Global Society, Whellen T.L. and Hunger J.D., Addison-Wesley

(c) The Paradox Principles: How High Performance Companies Manage Choas, Complexity and Contradiction to Achieve Superior Results, The Price Waterhouse Change Integration Team, Irwin.

(d) Competing for the Future, Hamel G. & Prahalad C.K., Harvard Business School Press

(e) Mergers, Restructuring, and Corporate Control, Weston J.F., Chung K.S. and Hoaf S.E., Prentice Hall of India

(f) Cases in Strategic in Strategic Management, Budhiraja S.B. and Athreya M.B., Tata McGraw Hill

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: Total supply chain Management			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Introduction to supply chain management -
Do we have the best suppliers at the lowest possible prices?
Are we getting and sending materials as quickly as possible?
Can the voices of our customers be heard in our processes?
Are customers satisfied with our products?

2) Creating outcome-driven tasks and processes
Retooling the structure and business strategy of the organization
Setting up effective people/responsibility charts
Incorporating technology for maximum benefit
Creating performance-based rewards
Measuring results

3) Materials Management, Scope, importance, classification of materials, Procurement, Purchasing policies, vendor development and evaluation, Inventory control systems of stock replenishment, Cost elements, EOQ and its derivative models. Use of computers for materials function.

4) Logistics and competitive strategy, System view of logistics – Coordination and management of transportation, Inventory Order processing, Purchasing, warehousing materials handling, packaging and customer service standards

5) Supply Chain management, Distribution network design, channels of Distribution, Plant and warehouse location.

6) Transportation Systems – Individual Freight and passenger modes, intermodal transportation and third party transportation services, economic social, and political roles of transportation, demand, cost and service characteristics of different transport services, carrier selection and evaluation methods, contracting for transportation services, freight rate structure, Private fleet management, Claim management, International transportation, Ocean carrier management, port administration and regulation, costing and pricing issues of international transportation, logistics, cost transport mode choice, Dispatch decisions, routing decisions, routing Models, packaging to suit mode of Transport.

7) Total distribution Cost analaysis

8) Logistic Information Systems.

References

Materials Managemet and purchasing, Ammer DS Taraporewala

Logistics and Supply Chain Management, Martin Christopher, Richard Irwin

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: Project Management			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

i) Projects & Project management, The project, Project Management., Types of projects, Contractual Arrangements.

(1) Readings: Basic Project Management- There are Four Types. & Making Project Management Work.

ii) The Nature of Project Management, Management principles, Some Factors in Project Management, The Project Manager. Factors for Project Success and Failure.

(1) Readings: The New Managerial work & Where does Project Cost Really Go Wrong? What it takes to be A Good Project Manager.

iii) Organizational Structures, The Project Organization, The Functional Organization, The Matrix organization, Designing an Organization, Building the Team, Leadership.

(1) Readings: Selection of the Team. & Matrix management: Contradiction and Insights.

iv) Project Administration: Project Authority & Project Control, Principles of Project Administration., TQM.

(1) Readings:

Skunk Works - Management Style- It's No Secret. & Executive Focus on Quality.

v) Defining and Financing the Project. How Project Evolve- the Client Brief., Financing the Project. Sources of Finance and Cash Flow.

(1) Readings:

(a) Structural Scale Models: Beyond The Computer.Clear Project Definition is Crucial. Construction Cost estimating in the Design Process.Meeting the Infrastructure Challenge.

(b) Three Perceptions of Project Cost - Cost Is More than A Four-Letter Word.

vi) Feasibility Studies and Approvals, Conducting a Feasibility Study, The Regulations Controlling Projects, Decision-Making, Economic Analysis.

(1) Readings:

(a) Project Management and Environmental Issues.

(b) Obstacles Encountered by a New Industrial Development.

(c) Environmental Planning and Engineering Decisions.

(d) Intellectual Sources of the Ideas of " acceptable Risk" in Public Policy.

(e) Speaking of Risk. Humble Decision-Making. Finding a Way to Measure Technology's Benefits. Justification Techniques for Advanced Manufacturing Technologies.

vii) The Management of Design, Documentation and Tendering: The Management of Design, Project Documentation, The Calling and Assessment of Tenders, Negotiation.

viii) The Planning of Project Implementation, The Plan of Execution, Planning the Time Scale

(1) Readings: Managing Software Development Projects.Balancing Strategy and Tactics in Project Implementations.

ix) On Time Project Completion- Managing the Critical Path.Resource Constrained Scheduling Capabilities of Commercial Project Management Software. Project Implementation and Control, Project Implementation, Project Execution, Project Control, Commercial Aspects.

(1) Readings: Managing Suppliers up to a Speed. Cost and Schedule Control in Naval Projects.Contract Negotiations, Dispute and Settlement. Project Management Control Problems: An Information Systems Focus.

x) Criteria for Controlling Projects According to Plan. Commissioning and Review, The Commissioning phase, The Completion of a Project.

(1) Readings: The Project Management Audit: Its Role and Conduct. & Knowing when to pull the Plug.

Reference

Project Management, Meridth & Mantel, McGraw Hill

Project Management - Principles and Practices, M. Pete Spinner, Prentice Hall

Essentials of Project management by Dick Billows

Projects: Planning Analysis, Selection , Implementation and Review by Chandra, Prasanna , TMH publication

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

Tutorial
There should be 3 tutorials or class test

Assignments
Should contain 4 assignment

CLASS: B. Sc (Information technology)		Semester - VI	
SUBJECT: IT Laws and Patents			
Periods per week. 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial	--	50

1) Copyright Basics

2) Basic Patent Information

3) Basic Facts About Trademarks

4) Fair Use Harbor

5) Software Piracy -- Don't Copy That Floppy

6) How To Intellectual Property Rights, Copyright, Trademark, Patent ...

7) Intellectual Property MANAGEMENT - Net Links

8) Patent and Trademark Office Home Page

9) Intellectual Property Issues Affect Entrepreneurs

10) Government Law: Intellectual Property

11) Lists of Links to Intellectual Property Law Sites

12) Basic Business Research Methods

13) Creativity and Innovation

14) Legal Information

15) Naming and Branding

16) Non-Compete Agreements

17) Nonprofits (additional information for nonprofit organizations)

18) Product Selection and Development

References

How To Register Your Own Copyright by Marx Warda, Sphinx Publishing

Licensing Art & Design by Caryn R. Leland, Allworth Press
A Professional's Guide to Licensing and Royalty Agreements by Caryn R. Leland
Allworth Press

IT2000 Bill

Case Study : Present a report of 10 – 15 pages on any topics from syllabus.

Tutorial

There should be 3 tutorials or class test

Assignments

Should contain 4 assignment

CLASS: B. Sc (Information technology)	Semester - VI
SUBJECT: Project	

Project – 200 Marks

- This is to be a group project with a maximum 4 students in one group.
- The project can be "in-house project" (project done within one's institution) or can be done in the industry.
- In case the project is in industry the group will be guided by External Project guide (from industry) and Internal Project Guide (from the institution).
- In case the project is "in-house" the group will be guided by the Internal Project guide.

Marks Distribution

Item	Marks	How to conduct Exam
Project report	100	Assessed jointly by internal and External examiner.
Viva Voce of the report	100	Assessed jointly by internal and External examiner.

Term Work evaluation

Whereever Practicals / Tutorials / Case Studies / Tests are shown they are to be treated as part of Term Work (Journal) Submitted for evaluation as a single unit.

Marks distribution for TermWork

Item	Marks	How to conduct Exam

Practical / Case Study	25	Internal assessment
Tutorial / Assignment / Test	25	Internal assessment

Guidliness for Eligibility for admission to FY B Sc - IT

No Common Entrance Test will be conducted.

Maths Compulsory at XII
Minimum 45 % aggregate for Open and 40% aggregate for reserved at XII

Tie break rules
    Maths at XII
    Total of XII
    Maths of X
    Science of X
    Total of X

Diploma Students

Dipolma in Computer Engineering / Comuter Science / Computer Technology / Electrical, Electronics and allied, Mechanical and allied, Civil and allied branches of Engineering are eligible.

However the Diploma should be recognized by Board of Technical Education or any other recognized Government body.

Minimum 45 % aggregate for Open and 40% aggregate for reserved.

Seat Distribution

XII stream, Arts / Science / Commerce	50
Diploma Stream	10
Total	60

Students with Post HSC - Diploma in Computer Engineering / Computer Science / Computer Technology will be eligible for direct admission to second year of B.Sc. (I.T). However the total enrollment cannot exceed 66 at 2nd year B Sc – IT level.

However the Diploma should be recognized by Board of Technical Education or any other recognized Government body.

R 4411 is treated as applicable to 2001 – 2002, 2002 – 2003 and further