MAHATMA GANDHI UNIVERSITY

PRIYADARSHINI HILLS, KOTTAYAM – 686 560

CHOICE BASED COURSE CREDIT SEMESTER SYSTEM AND GRADING

SCHEME & SYLLABI

For

Under Graduate Course

in

INFORMATION TECHNOLOGY

2009

B.Sc. Information Technology Course

1. About the Course

Technology is defined as the applications of Basic Science. The past two revolutions, industrial and electronic, have transformed the society from agricultural to industrial and then to electronic. The electronically based technologies focused in information gathering, processing and distribution. The use of this technology in all sectors gave the birth to Computer Industry and its unprecedented growth launched another revolution in Communication.

Information, the basic raw material for the Decision Support System, can be derived from processing of huge database related with different sectors. Systematic storage and management with adequate security are essential for data retrieval and processing to generate information. The information technology plays an important role, in all areas. But the main drawback is the technophobia of the people to adapt with the new technologies. This may be due to lack of awareness of the merits and advantages of new technologies. So our youths have to be equipped with all kinds of knowledge tools to work with computers comfortably which are basic requirements to provide human resource to the industry.

The radical changes in technologies, both hardware as well as software and their ever increasing adaptation to newer areas of application, demand frequent updation of the academic curriculum so that the students can rise to the expectation of the Industry. The syllabus revision committee has considered all these factors thoroughly before venturing into the revision exercise.

The revised syllabus for B.Sc. Information Technology Programme provides a strong foundation to pursue post graduation programme in computer science / applications. The knowledge acquired by the students may also equip them to meet the industrial need, and get placed.

The B.Sc. Information Technology Programme of the MG University follows the choice based credit semester system as envisaged by the University Grants Commission and the Higher Education Council of Kerala. The Programme shall be completed in six semesters. Each semester is a minimum of 18 instructional weeks, comprising 90 working days with continuous internal evaluation and University examination at the end of each semester.

2. Course Objectives

The B.Sc. IT Programme is designed with the following specific objectives.

(a) To attract young minds to the potentially rich & employable field of computer Science.

(b) To be a foundation graduate programme which will act as a feeder course for
higher studies in the area of Computer Science/Applications.

(c) To develop skills in software development and hardware maintenance so as to enable the graduates to take up self-employment in Indian & global market.

(d) To Train & Equip the students to meet the requirement of the Industrial standards.

3. Admission

The eligibility for admission to B.Sc. IT Degree under the Mahatma Gandhi University is a pass in Pre-degree, Plus Two or equivalent examinations in science stream with Mathematics/Computer Science as a compulsory subject.

4. Registration

All the candidates admitted for the course should register with the M.G University along with the original certificate of the qualifying examinations within 3 months from the date of commencement of the I semester course.

5. Duration of Course

The course shall normally extend over a period of three academic years

consisting of six semesters.

6. Requirement of Attendance and Progress

A candidate shall normally be permitted to register and appear for the end semester university examinations if

(a) He/She secured not less than grade C for attendance in each course of study in the semester, and

(b) His/Her progress is satisfactory in the internal assessment in each of the subjects.

7. Examination System

7.1. The evaluation of each course shall contain two parts

(i) Internal or In-Semester Assessment(ISA)

(ii) External or End-Semester Assessment(ESA)

The internal: external examinations ratio shall be 1:3

7.2. The Internal and External examinations shall be evaluated using Direct Grading system based on 5-Point scale as given below

Letter Grade	**Performance**	**Grade Point(G)**	**Grade Range**
A	Excellent	4	3.5 to 4.00
B	Very Good	3	2.5 to 3.49
C	Good	2	1.5 to 2.49
D	Average	1	0.5 to 1.49
E	Poor	0	0.0 to 0.49

7.3. The overall grade for a programme for certification shall be based on CGPA with a 7-point scale given below.

CGPA	Grade
3.80 to 4.00	A+
3.50 to 3.79	A
3.00 to 3.49	B+
2.50 to 2.99	B
2.00 to 2.49	C+
1.50 to 1.99	C
1.00 to 1.49	D

A separate minimum of D Grade for internal and external are required for a pass for a course. For a pass in a programme a separate minimum of Grade D is required for all the courses and must score a minimum CGPA of 2.00 or an overall grade of C+ and above.

7.4. Internal evaluation: is to be done by continuous assessments on the following components.

7.4.1. Components of the Internal evaluation and their weights are as below.

(i) Theory

Component	Weight
Attendance	1
Assignment	1
Seminar	1

Two test papers	2

(ii) Practical ****

(iii) Project ****

(iv) On-the-Job training ****

(v) Social service activity ****

(vi) Co-curricular activity ****

7.4.2. Attendance

%age of Attendance	**Grade**
>90%	A
Between 85 and 90	B
Between 80 and 85	C
Between 75 and 80	D
<75	E

7.4.3. Assignments : Best two assignments are considered per course.

7.4.4. Seminar / Viva: The student has to take a minimum of 1 seminar per course.

7.4.5. Class test : A minimum of 2 class tests are to be attended. The grades of best 2 test are to be taken.

7.4.6. The evaluation of all components are to be published and are to be acknowledged by the candidate. All documents of internal assessment are to be kept in the college for 2 years and shall be made available for verification by the university. The responsibility of evaluating the internal assessment is vested on the teacher(s) who teach the course.

In case a candidate fails to secure the minimum grade D in internal assessment, he/she may secure it by repeating the course altogether in a regular class or to take the course with a faculty member assigned by the Head of the Department. But such improvement in internal the same paper cannot be attempted more than once.

The supplementary examinations will be conducted along with the next regular semester examinations.

8. Pattern of Questions

Questions shall be set to assess knowledge acquired, standard application of knowledge, application of Knowledge in new situations, critical evaluation of knowledge and the ability to synthesis knowledge. The question setter shall ensure that questions covering all skills are set. He/she shall also submit a detailed scheme of evaluation along with the question paper.

A question paper shall be a judicious mix of objective type, short answer type, short essay type/problem solving and long essay type questions.

Weight: Different types of questions shall be given different weights to quantify their range as follows:

	Type of questions	**Weight**	**Number of questions to be answered**
1	A bunch of 4 objective type questions	1	5 bunches (no choice)
2	Short answer type questions	1	5 out of 8
3	Short essay / problem solving type	2	4 out of 6
4	Essay type questions	4	2 out of 3

9. Requirement for the completion of programme

A candidate has to complete the Programme within a period of five years after the registration.

A candidate who does not complete the concerned semester with the minimum attendance requirement prescribed will not be permitted lo attend the next semester.

Names of Expert Committee for B.Sc. IT.

Choice Based Credit Semester System and Grading, 2009

1. Mrs. Juiny Rebello (Convenor)
   Lecturer
   Siena College of Professional Studies
   Edaccochin – 682 006.

2. Mr. Mariadas Ronnie C. P.
   Lecturer
   Siena College of Professional Studies
   Edaccochin – 682 006.

3. Mrs. Shalini Suresh
   Lecturer
   Siena College of Professional Studies
   Edaccochin – 682 006.

4. Smt. Remya Elsa George
   Lecturer
   VNS College of Arts and Science
   Konni

5. Smt. Maya V. B.
   Lecturer
   Viswabrahmina College
   Vechoochira

6. Mrs. Sherlin Baby
   Lecturer
   St. Mary's College
   Paliakara

Proposed Scheme for B.Sc. IT Programme

Revised Curriculum 2009

Semester I

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 101(T)	English – I	5		4	Common
B.Sc. IT 102(T)	Mathematics	4		4	Complementary
B.Sc. IT 103(T)	Introduction to programming in C	4		3	Core
B.Sc. IT 104(T)	Introduction to Computer Fundamentals	4		4	Core
B.Sc. IT 105(P)	Computer Applications – Lab		4	2	Core Lab
B.Sc. IT 106(P)	Programming in C - Lab		4	2	Core Lab

Semester II

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 201(T)	English – II	5		4	Common
B.Sc. IT 202(T)	Probability & Statistics	4		4	Complementary
B.Sc. IT 203(T)	Data Structures	4		4	Core
B.Sc. IT 204(T)	Computer Organisation and Architecture	4		4	Core
B.Sc. IT 205(T)	Object Oriented Prog. with C++	4		3	Core
B.Sc. IT 206(P)	Programming in C++ - Lab		4	2	Core Lab

Semester III

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 301(T)	System Software	4		4	Core
B.Sc. IT 302(T)	Operations Research	4		4	Complementary
B.Sc. IT 303(T)	Visual Programming	4		3	Core
B.Sc. IT 304(T)	System Analysis and Design	4		4	Core
B.Sc. IT 305(T)	DBMS	4		3	Core
B.Sc. IT 306(P)	VB & Oracle - Lab		5	2	Core Lab

Semester IV

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 401(T)	Design and Analysis of Algorithm	4		4	Core
B.Sc. IT 402(T)	Discrete Mathematics	4		4	Complementary
B.Sc. IT 403(T)	Microprocessor and its Applications	4		3	Core
B.Sc. IT 404(T)	Computer Networks	4		4	Core
B.Sc. IT 405(T)	Operating Systems	5		4	Core
B.Sc. IT 406(P)	Microprocessor – Lab		4	2	Core Lab

Semester V

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 501(T)	Computer Graphics	4		4	Core
B.Sc. IT 502(T)	Java Programming and Internet	3		4	Core
B.Sc. IT 503(T)	E-Commerce and its Applications	4		3	Core
B.Sc. IT 504(T)	Open Course	4		4	Open Course
B.Sc. IT 505(P)	Java – Lab		4	3	Core Lab
B.Sc. IT 506(P)	Mini Project		6	3	Core Project

Open Course

1. Multimedia Systems
2. Linux Operating Systems and Programming
3. Management Information Systems
4. Financial Accounting and Tally

Semester VI

Course No.	Course	No. of Hours/Week		Credits	Course Type
		Lect.	Lab.		
B.Sc. IT 601(T)	Web Technology	4	4	4	Core
B.Sc. IT 602(T)	Client/Server Computing	4		4	Core
B.Sc. IT 603(T)	Choice based Core Course	4		4	Choice based Core
B.Sc. IT 604(P)	General Seminar		2	2	Core Seminar
B.Sc. IT 605(P)	Project + Course Viva		7	4	Core Project

Choice based Core Course

1. Network Security and Cryptography

2. Data Mining
3. Mobile Computing
4. Bioinformatics

B.SC. IT 101(T) - ENGLISH – I

(COURSE TYPE: COMMON)

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MATHEMATICS

Semester : *I*

Course No. : *B.Sc. IT 102(T)*

Course Type : *Complementary*

Credits : *4*

Aim of the Course

Aim of the course is to develop analytical and critical thinking skills in students to prepare them to logically analyse and critically evaluate problem situation through basic mathematics.

Objectives of the Course

- To develop scientific ability
- To critically evaluate mathematical problems
- To know about modern trends in mathematics

Unit-1:

Matrices & Determinants: Introduction, Definition, special matrices, addition and subtraction of matrices, multiplication of a matrix by a scalar, multiplication of matrices, related matrices, matrix method of solution of simultaneous equations, rank of a matrix, normal form of a matrix. Determinants – Crammar's rule - consistency of equations.

Unit-2:

Partial Differential Equations: Introduction, formulation of PDE by elimination of arbitrary constants and by elimination of an arbitrary function solution of Lagrange's partial differential equation.

Unit-3:

Differential Calculus: Differentiation of hyperbolic and inverse of hyperbolic

function - differentiation of a function with respect to another function, the n^{th} derivative of functions, statement (without Proof) and application of Leibnitz theorem.

Unit-4:

Fourier series: Euler's formulae, condition for a Fourier expansion functions having points of discontinuity, Odd and even functions - definition - Expansion of odd or even periodic functions.

Unit-5:

Laplace Transforms: Definitions - transforms of elementary functions, properties of Laplace transforms, Inverse transforms - Convolution theorem (no proof).

Text Book:

1. Engineering Mathematics – Bali, Iyengar
2. Higher Engineering Mathematics - Dr. B. S Grewal

INTRODUCTION TO PROGRAMMING IN C

Semester : *I*

Course No. : *B.Sc. IT 103(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

Aim of the course is to provide awareness about programming and programming languages and clear understanding about software development using C programming language.

Objectives of the Course

- Understand different tools for system analysis
- Understand control flow structure, data types
- Understand vector, pointer and file processing
- Debugging and system implementation

Unit 1 :

C fundamentals :-The C- character set, Keywords, data types, constants, variables, qualifiers- long, short and unsigned - declaration.

Unit 2 :

Arithmetic expressions : operators – arithmetic, logical, increment, decrement, assignment, precedence and order of evaluation - conditional expressions.

Unit 3 :

Control flow : if statements – if…else statements and nested if…else statements - switch statement – looping - for loop, nested loops, while and do while statements, break and continue statements.

Unit 4 :

Functions : Defining and accessing a function, function declaration and prototypes - passing arguments to a function - call by value and call by reference - auto, static and register variable, recursion.

Unit 5 :

Defining an array : processing an array - passing arrays to function - multidimensional arrays - string manipulations - sorting with arrays.

Unit 6 :

Structures and Unions: Defining a structure, processing a structure, type def statement, passing structures to a function, union.

Unit 7 :

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointers and arrays, simple examples, dynamic memory allocation.

Unit 8 :

Opening and closing a data file, creating and processing a data file, preprocessors.

Text books:

Programming in ANSI C by E. Balaguruswamy

Reference:

Programming with C-Byron S Gott, (Schaum's Outline Series), Tata Mc Graw Hill.

INTRODUCTION TO COMPUTER FUNDAMENTALS

Semester : *I*

Course No. : *B.Sc. IT 104(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provide the knowledge of basics of the computer along with the basic digital concepts.

Objectives of the Course

- To provide the students with the basic concepts of the computer
- To include the memory concepts
- To make the students know about the number system
- To let the students know about the various flip flops, multiplexers, registers, etc.

Unit 1:

Structure of a computer system : processor, memory, input and output devices, storage, application of computers, different types of computers : personal computers, mini computers, mainframe and super computers, languages : High level, assemblers, Interpreters, Compilers, 4GLs.

Unit 2:

Data Processing : Representation of data, the CPU: Control Unit, ALU, Memory, RAM, ROM, factors affecting processing speed, different types of CPUs used in PCs.

Unit 3:

Number System : Decimal bistable devices, counting in the decimal number system, conversion from decimal to binary and binary to decimal , binary addition and subtraction, binary multiplication and division, 1's complement and 2's complement forms, signed magnitude representation, BCD numbers, Octal and hexadecimal numbers.

Unit 4:

Boolean Algebra and Gate networks: Basic logic gates - AND, OR, NOR, NAND, EXOR, symbols and truth table, basic laws of Boolean Algebra, DeMorgans theorem, simplification of expressions using basic laws, duality of Boolean algebra, derivation of a Boolean expression, interconnection of gates, SOP and POS expressions, canonical forms, simplification of Boolean functions using K-map, Don't care conditions, realization using logic gates.

Unit 5:

Logic design, flip flops, RS, JK, T and D flip flops, blocked flip flops, Master slave flip flops, half adder, full adder, decoders, encoders, multiplexers, registers, shift registers.

Text Book:

1. Peter Norton's Introduction to Computers, Tata Mc Graw-Hill, Second Edition.
2. Digital Principals and applications, Malvino & Leach, Tata Mc Graw-Hill.

Reference:

1. Digital Computer Fundamentals, Thomas C. Burtee- 6^{th} Edition, Tata Mc Graw-Hill.

COMPUTER APPLICATIONS LAB

(DOS, LINUX, MSOFFICE)

Semester : *I*

Course No. : *B.Sc. IT 105(P)*

Course Type : *Core Lab*

Credits : *2*

Aim of the Course

Aim of the course is to provide awareness about DOS, LINUX and Windows environment and working knowledge of MS Office.

Objectives of the Course

- To learn the DOS commands
- To learn the LINUX commands
- To learn the use of Windows
- Basic working knowledge in MSWORD
- Basic working knowledge in MSEXCEL

MS-DOS:

File naming convention (8.3), Internal Commands: CLS, VER, VOL, TIME, DATE, TYPE, COPY, DIR, DEL, REN, MD, MKDIR, CD, DHDIR, RD, RMDIR, ROMPT, PATH, wild characters, redirection, batch files, REM, ECHO, PAUSE, IF, FOR, External Commands: TREE, LABEL, DISKCOPY, DISKCOMP, UNDELETE, MOVE, ATTRIB, HELP, DOSKEY, EDIT, RESTORE, Filter Commands: MORE, SORT, FIND, using pipe

LINUX:

Linux standard directories, commands for files and directories – cd, ls, cp, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing using cat, file comparisons, view files, process fundamentals, batch commands, kill, ps, who, sleep, printing commands, find, sort, touch, file processing commands –wc, cut, paste, mathematical commands expression, simple filter commands- pr, head, tail, uniq, egrep and sed, simple shell

programs.

MSWORD:

Editing, formatting, bullet and numbering, borders and shading, tab, columns, change case, style creation, header and footer, File- new, open, save, close, page setup, cut, copy, paste, ind, replace, goto, insert, page number, break, date and time.

MSEXCEL

Editing, formatting, text and cells, column, rows, sheets, conditional formatting, inserting rows & columns, picture and pivot table, sorting, filter, subtotal.

PROGRAMMING IN C - LAB

Semester : *I*

Course No. : *B.Sc. IT 106(P)*

Course Type : *Core Lab*

Credits : *2*

Aim of the Course

Aim of the course is to provide awareness about programming and programming languages and clear understanding about software development using C programming language.

Objectives of the Course

- Understand different tools for system analysis
- Understand control flow structure, data types
- Understand vector, pointer and file processing
- Debugging and system implementation

Programs using Basic Constructs: Fundamental data types, qualifiers- long, short, unsigned, input/output functions – scanf(), printf(), Arithmetic expressions, Evaluation of integer, real and mixed mode arithmetic expressions, truncation effect, type casting, relational and logical expressions, Conditional operators, trigonometric functions- sin(), cos(), tan(), mathematical functions – abs(), sqrt(), round() defined in math.h, printing formatted outputs using width specifier. (8 hrs)

Programs using control structures: if, switch, for, while, do…while, nested structures, break and continue. Sample programs should include printing of Fibonacci numbers, prime numbers, check for armstrong numbers, summation series – exp(x), sin series etc and verification of result using built in functions, printing pyramid like pattern & other similar patterns using nested loops. (10 hrs)

Programs using Arrays: Array based programs – Creation of array containing prime numbers, matrix addition, matrix multiplication, transpose of a matrix, array sorting, preparing rank lists based on marks, searching of arrays(linear) for finding price of an item. static initialization of arrays. (6 hrs)

String manipulation programs : reading strings using %s, gets(), getchar(), copying

one string into another, counting number of characters, vowels, words etc, searching for substring, string manipulation using functions in string.h and ctype.h. (4 hrs)

User Defined Functions: Programs using return type functions, void type functions, example program using recursive functions, array sorting program using function with call by reference, function to copy one string into another, menu driven program using modular approach in programming. (6 hrs)

Program using structures: array of structures, dictionary search program using structure containing arrays and array of structures. (2 hrs)

Program using pointer : initialization, pointer arithmetic - swap function to interchange two locations, array manipulation using pointers- sorting list of names using pointer array, string handling using pointers, Simple program using dynamic memory allocation. (4 hrs)

Program to create a data file, reading a data file , search for record(serial search) and displaying report, simple program using command line arguments- to copy one file into another by giving file names as arguments, sorting list of names provided at command line. (6 hrs)

B.SC. IT 201(T) - ENGLISH – II

(COURSE TYPE : COMMON)

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PROBABILITY AND STATISTICS

Semester : *II*

Course No. : *B.Sc. IT 202(T)*

Course Type : *Complementary*

Credits : *4*

Aim of the Course

Aim of the course is to provide a reasonable grasp of basic statistical methods needed for a statistical investigation and forecasting.

Objectives of the Course

- To present a broad overview of statistics as a subject
- To organize a statistical survey
- To understand the importance of summary measures to describe the characteristics of data set
- To analyse the relationship between two variables
- To use the various forecasting techniques

Unit 1:

Statistical inquiries and sampling: Collection of Data, Primary & secondary, questionnaire, definition of statistics, population, census and sampling different sampling techniques, simple random sampling, stratified random sampling, systematic sampling, cluster sampling, sampling and non sampling errors

Unit 2:

Characteristics of statistical data: Classification tabulation, diagrams and graphs Frequency distribution one &two dimensional bar diagram, pie diagram, line graph, histogram frequency polygon, curve, ogive

Unit 3:

Analysis of data: Range, Q.D, M.D, Mean, Median, Mode, Standard deviation, coefficient of variation.

Unit 4:

Probability: Basic concepts in probability, statistical dependence and independence, prior estimates of probabilities, Baye's theorem, random variables, expected value decision making, bionomial distribution, poisons continuous random variable, choosing correct probability distribution.

Unit 5:

Correlation & Regression: Different types of correlation, Different methods of studying correlation, Correlation coefficient, Rank correlation coefficient, Two regression lines, Estimation of dependant variable - Difference between correlation & regression.

Text book:

1. Statistical method - S.P. GUPTA--13th revised edition
2. An Introduction to Statistical Methods - C B GUPTA

DATA STRUCTURES

Semester : *II*

Course No. : *B.Sc. IT 203(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

To provide the basic knowledge of solving real life problems using various datastructures. Different varieties of data structures and operations on these data types are introduced.

Objectives of the Course

- To provide the students with the knowledge of problem solving techniques.
- To provide information regarding various methods of structured data storage.
- To familiarise different operations on these data structures.
- To have a comparative study regarding the data structures.

Unit 1:

Concept of structured data : Different types of data structures, complexity of algorithms, Arrays, bubble sort, linear search, binary search, sparse matrix, organization and operation on 1, 2 and 3 dimensional arrays

Unit 2:

Stacks and Queues : Organization and operation on stacks, conversion between prefix, infix and postfix representations, expression evaluation, organization and operation on queues multiple stacks and queues, dequeue.

Unit 3:

Linked list : Concept of dynamic data structures, linked list using pointers, insertion and deletion - examples, circular list, two way lists, garbage collection.

Unit 4:

Tree : Concept of recursion, definition of trees and binary trees, threaded binary tree, traversing methods - examples.

Unit 5:

File Organization : Operation on sequential and random files, linked organization, inverted files, cellular partitioning, hashing, comparative study of data structures- array Vs lists, queues Vs stacks, random access Vs sequential access files, static Vs dynamic data structures.

Text books:

Fundamentals of Data Structures, Ellis Horowitz and Sartaj Sajnii, Galgotia Publications.

Reference:

Schaum's Series, Tata McGraw Hill.

COMPUTER ORGANISATION AND ARCHITECTURE

Semester : *II*

Course No. : *B.Sc. IT 204(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provide the students with the knowledge of the organization and architecture of the computer mainly the addressing method, processing unit, parallel processing etc..

Objectives of the Course

- The student should know the internal organization of the computer
- To know the architecture of the computer
- To introduce the parallel processing concept

Unit 1:

Functional units of a computer, basic operational concepts, bus structures.

Unit 2:

Addressing methods: Memory location and addresses, instructions and instruction sequencing, instruction execution, addressing modes.

Unit 3:

The processing unit: General register organization, stack organization, instruction formats, instruction classifications.

Unit 4:

Main memory: organization of RAM and ROM, auxiliary memory, cache memory, virtual memory.

Unit 5:

Introduction to parallel processing: Evolution parallelism in unprocessed systems, parallel processing Mechanisms.

Unit 6:

Parallel computer structures: Pipeline computers array processors, multiprocessing systems, architectural classification Scheme SISD, SIMD, MISD, MIMD

Unit 7:

Pipelining and vector processing: Principles, classification of Pipeline processors-instruction and arithmetic pipelines: designs.

Text Book:

1. Computer System Architecture, M. Moris Mano
2. Computer architecture and parallel processing by Kai Hwang Feue A Briggs.

Reference:

Computer Organization, Hamacher

OBJECT ORIENTED PROGRAMMING AND C++

Semester : *II*

Course No. : *B.Sc. IT 205(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

Aim of the course is to provide awareness about programming and programming languages and clear understanding about software development using C^{++} programming language.

Objectives of the Course

- Understand different tools for system analysis
- Understand control flow structure, data types
- Understand vector, pointer and file processing
- Debugging and system implementation

Unit 1:

Introduction : Objects, object oriented development, object oriented methodology, object oriented models, object oriented themes, modeling

Unit 2:

Object Modeling, objects and classes, links and association, advanced links and association concepts, generalization and inheritance, grouping constructs, dynamic modeling, functional modeling

Unit 3:

Object Oriented language C++: structure of C++ program, basic and user defined data types, functions in C++, the main function, function prototyping, call by reference, return by reference, function overloading, friend and virtual functions, classes and objects, specifying a class, defining member functions, nesting of member functions, private member functions, arrays within a class, static data members, static member functions, Arrays of objects, objects as function arguments

Unit 4:

Constructors and Destructors : Copy constructor, dynamic constructor, destructors, operator overloading, inheritance, defining derived classes-, single, multiple, multilevel, hierarchical and hybrid inheritance, virtual base classes, abstract classes

Unit 5:

Pointers : Virtual functions and polymorphism, pointers to objects, this pointer, pointers to derived classes, virtual functions, C++ streams, stream classes, unformatted and formatted console I/O operations, managing output with manipulators.

Text books:

1. Object Oriented Modeling and Design, James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy
2. Object oriented Programming By Balaguruswamy

PROGRAMMING IN C++ - LAB

Semester : *II*

Course No. : *B.Sc. IT 206(P)*

Course Type : *Core Lab*

Credits : *2*

Aim of the Course

Aim of the course is to provide awareness about programming and programming languages and clear understanding about software development using C^{++} programming language.

Objectives of the Course

- Understand different tools for system analysis
- Understand control flow structure, data types
- Understand vector, pointer and file processing
- Debugging and system implementation

Programs based on class, objects and manipulation of objects using member functions

Programs based on friend functions, passing objects as arguments to function.

Programs based on array of objects.

Programs based on function overloading, Default arguments.

Programs based on operator overloading (binary, unary) using member functions and friend functions.

Programs based on constructors, different types of constructors- copy constructor, default constructor.

Programs based on Inheritance, different types of inheritance.

Programs using virtual functions and polymorphism

SYSTEM SOFTWARE

Semester : *III*

Course No. : *B.Sc. IT 301(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provides the answer to the questions, What is happening inside the computer? and How things are done in a computer?

Objectives of the Course

- Provides an insight into the internal functioning of the computer
- To understand the systems point of view
- Provides an idea regarding the way computer understands things

Unit 1:

System Software: General Concepts, assemblers, design of assemblers, macros and macro processors, macro definitions, features of macro facility, nested macro c alls

Unit 2:

Loading, Linking and Relocating: Loading and linking schemes, relocatability of programmes, concepts of binders, linking loaders, overlays, dynamic binders, design of an absolute loader

Unit 3:

Phases of compiler: aspects of compilation, datatypes, data structures, scope ruler, control structure, compilation process, analysis phase, synthesis phase, programming language grammar, derivations, reduction and system trees

Unit 4:

Classification of grammars: Ambiguity in program specification, lexical scanner, parsing topdown, bottomup, table driven parsing

Unit 5:

Compilation of expressions: intermediate code forms for expression, compilation of control structures, code optimization, local and global

Text book:

Systems Programming and Operating Systems by D.M. Dhamdhere, - Tata McGrow Hill

Reference:

Principles of Compiler Design by Aho and Ullman

OPERATION RESEARCH

Semester : *III*

Course No. : *B.Sc. IT 302(T)*

Course Type : *Complementary*

Credits : *4*

Aim of the Course

To create a better awareness in constructing mathematical and statistical model of the problem under study and to treat situations of complexity and uncertainty.

Objectives of the Course

- ❖ To resolve the conflicts of interest among various sections
- ❖ To analyse the relationship among different variables and parameters
- ❖ To develop scientific ability

Unit 1:

Beginning of O.R: Problems in O.R., Mathematical Modeling.

Unit 2:

Linear Programming: Formulation of LP models, Solution of a L.P.P., Graphical method for solving a L.P.P.

Unit 3:

Simplex Method: Maximisation/ Minimisation of objective functions, Simplex method, Unbounded solution-optimality conditions- artificial variable Techniques-Big M method.

Unit 4:

Transportation problems: Transportation model, Solution by North West corner lowest cost entry Vogel's and MODI method, Degeneracy Assignment problems.

Unit 5:

Game Theory: Two persons zero sum games, pure and mixed strategy with saddle point, solution of pure strategy games, solution of mixed strategy problems by arithmetic method, principle of dominance.

Text Book:

Operations Research, Prem Kumar Gupta & D.S Hira, Kanti Swaroop

VISUAL PROGRAMMING

Semester : *III*

Course No. : *B.Sc. IT 303(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

To provide a general outlook of visual programming techniques using Visual Basic.

Objectives of the Course

- To illustrate the applications different controls in Visual Basic
- To develop a concept of files, classes and event handlers in Visual Basic
- To acquire basic knowledge of reports and ActiveX controls.

Unit 1:

Introduction to windows, GUI concept, concept of event driven programming, the Visual Basic IDE, types of Visual Basic projects, Visual Basic Editions, the Visual Basic project life cycle, project files

Unit 2:

Programming elements, data types, constants, variables, operators, user defined data types, library functions, program comments, arrays, dynamic arrays, strings, enumerations, logic statements, conditional constructors (If…then, select case), Iteration (Do loop, for loop), do events, exit, stop and end, Functions and Subroutines – arguments, By ref Vs. By Val parameters, optional arguments, Module basics, event procedures, class modules, types of errors, error handling, creating error handlers, debugging, debugging tools

Unit 3:

Forms, controls, control arrays, menus, menu editor, graphics programming, simple animation, SDI and MDI application, Database concepts – visual data manger, the ADO data control, data grid control, DB List and DB combo controls, Data view window, data form wizard, data environment designer

Unit 4:

Visual Basic files access, File I/O commands, file common dialogs, object oriented programming with Visual Basic, defining classes, classes Vs. Modules, object life time, constructors and destructors, class properties, fields and methods, creating and using objects, collections in Visual Basic, event and event handlers

Unit 5:

Reports using Crystal reports, data environment, reports using data reports, error handling, creating ActiveX controls, ActiveX EXE, ActiveX DLL

Text Book:

Visual Basic 6 : How to Program, H. M. Deitel, P. J. Deitel and T. R. Neilo, Pearson Education

Reference:

Mastering VB 6, Evangelous Petroutosos – BPB Publications

Visual Basic, Shaum's outlines,Byron S Gottfried

SYSTEMS ANALYSIS AND DESIGN

Semester : *III*

Course No. : *B.Sc. IT 304(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provide a reasonable grasp of system analysis and make the students able to design perfect software.

Objectives of the Course

On the completion of the course students will be able to

- ❖ Study and analyse the existing system and suggest modifications
- ❖ Specify modules, processes, inputs, outputs, etc.
- ❖ Evaluate the feasibility of a software
- ❖ Design a software
- ❖ Develop test cases and debugging methods

Unit 1:

Overview: Business system concepts, system development lifecycle, project selection, feasibility analysis, design, implementation, testing and evaluation.

Unit 2:

Project selection: Sources of project request, managing project review and selection, preliminary investigation.

Unit 3:

Feasibility Study: Technical and economical feasibility, cost benefit analysis.

Unit 4:

System requirement: Specification and analysis, fact finding techniques, data flow diagrams, data dictionaries, process organization and interactions, decision analysis, decision trees and tables.

Unit 5:

Detailed design: Modularization, module specification, file design, system development involving databases.

Unit 6:

System Control and Quality Assurance: design objectives, reliability and maintenance, software design and documentation tools, top down and bottom up variants, units and integration testing, testing practices and plans, system controls, audit trails

Unit 7:

System Administration: Training, conversion, operation plans.

Unit 8:

Hardware and software selection: hardware acquisition, memory, processors, peripherals, bench marking, vendor selection, software selection, performance and acceptance criteria.

Text book:

System Analysis and Design, Awad E M, Galgotia

References:

System Analysis and Design, Lesson, SRA Pub.

DATABASE MANAGEMENT SYSTEM

Semester : *III*

Course No. : *B.Sc. IT 305(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

Aim of the course is to provide an understanding about the concepts of database. It also introduces various techniques to access these databases

Objectives of the Course

- ❖ Study and analyse the database concepts
- ❖ Identify the concept of datatypes
- ❖ Working knowledge in SQL commands
- ❖ To suggest the best Normalisation techniques

Unit 1:

Introduction: characteristics of database approach, problems with file system, data models, schemas and instances, data independence, database languages, duties of database administrator, Entity Relationship Model, attributes and keys, specialization and generalization, overall database structures.

Unit 2:

Physical and data organization: hashed files, indexed files, B-Trees, sequential organization files, relational algebra, tyuple relational calculus, domain relational calculus, SQL.

Unit 3:

Normalisation, functional dependency, multivalues dependency, different normal forms.

Unit 4:

Transaction processing, desirable properties of transaction, serialisability of scheduler, concurrency control techniques, time stamp ordering and multiversion techniques, shadow paging, database security and authorization.

Unit 5:

Distributed databases, structure of distributed databases, centralized databases, Introduction to object oriented databases, features – object identity, object containment, inheritance, OODBMS and ORDBMS, introduction to damining and data warehousing.

Text book:

Fundamentals of Database Systems, R. Elmarsi and SB Navathe, Addison Wesley.

References:

1. An Introduction to Data base systems, C.J Date.
2. Database Management Systems. Reghu Ramakrishnan, McGraw Hill International Edition.

VB & ORACLE LAB

Semester : *III*

Course No. : *B.Sc. IT 306(P)*

Course Type : *Core Lab*

Credits : *2*

Aim of the Course

Aim is to get familiarize with the visual programming methodology and efficient data storage

Objectives of the Course

- Study and analyse the database concepts
- Knowledge regarding datatypes
- Working knowledge in SQL commands
- To familiarize with the visual programming environment
- Working knowledge with data and other controls

[There will be two questions, the first one (25 marks) from Group I and second (50 marks) from Group II]

I SQL Commands: (2 hours per week)

1. Data definition commands - CREATE, ALTER, DROP, Adding Constraints - Primary key, foreign key, unique key, check, not null.
2. Basic SQL queries - INSERT, SELECT, DELETE, UPDATE, Using multiple tables, ordering of rows using ORDER BY option, Set operations using UNION, EXCEPT, INTERSECT, Substring Comparison using LIKE operator, BETWEEN operator.
3. Complex Queries -Nested Queries, EXISTS and UNIQUE/DISTICNT functions, NULL values, Renaming of attributes and Joining of tables, Aggregate functions and grouping.
4. Managing views, Simple stored procedures.
5. Data Control commands - Access Control and Privilege commands.

II Visual Basic (4 hours per week)

1. Designing User Interface using- List Box, Combo Box, Image and Picture Box, Directory-File-Drive list boxes, Rich text box, etc
2. Creating Menus- Creating Menus and writing Codes, Linking Menus with SDI
3. forms, Creating toolbox and access it for loading and working forms.
4. Database Connectivity using Controls - Designing user interface with forms
5. and controls and create database connectivity by DAO and ADO Control.
6. Database connectivity using Object models - Creating Database connectivity by DAO Object model and Connectivity Using ADO Object model by OLE DB as well as ADODC Connectivity.
7. Creating Reports - Create reports using Data Report in VB and also using Crystal report.
8. Package and deployment Wizard - Package, Deploy and Scripting

DESIGN AND ANALYSIS OF ALGORITHMS

Semester : *IV*

Course No. : *B.Sc. IT 401(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to teach the students the basics of algorithms and the different techniques of problem solving

Objectives of the Course

On completion of the course, students should be able:

- To learn the divide and conquer method of problem solving
- To apply the technique of Greedy method of problem solving
- To learn the dynamic programming method
- To understand the search and traversal techniques for graphs
- To learn the backtracking and branch and bound method of problem solving

Unit 1:

Divide-and –conquer strategy: searching, sorting and selection algorithm based on divide and conquer techniques, Straseen's Matrix multiplication algorithm.

Unit 2:

Greedy method: Optional storage on tapes, Knapsack and job sequencing problems, Optimal merge patterns. Minimum spanning trees, Single source shortest paths.

Unit 3:

Dynamic Programming Method: Binary tree and graph algorithms based on dynamic programming, Knapsack and scheduling problems.

Unit 4:

Search and traversal techniques for graphs: Code optimization, AD/OR graphs, Game trees, biconnected components.

Unit 5:

Backtracking Method: 8-queens problem, sum of subsets, graph coloring, Hamiltonian cycles, Knapsack problem, Branch and bound method, Knapsacks problem, traveling salesman problem, efficiency of branch and bound algorithm.

Text Book:

Fundamentals of Computer Algorithms, Horowitz E. & S.Sahni, Galgotia Pub.Pvt. Ltd.

References:

Algorithms, Sedgewick R., Addison- Wesley.

Computer Algorithms: Introduction to Design & Analysis Baese S.

DISCRETE MATHEMATICS

Semester : *IV*

Course No. : *B.Sc. IT 402(T)*

Course Type : *Complementary*

Credits : *4*

Aim of the Course

Aim of the course is to develop analytical and critical thinking skills in students to prepare them to logically analyse and critically evaluate problem situations

Objectives of the Course

- To develop logical ability
- To critically evaluate mathematical problems
- To know about modern trends in mathematics

Unit 1:

Preliminaries: Basic Set Theory Terminology and notation, Venn Diagrams, Truth Tables and proof, Functions and relations, Partial Orderings and equivalence relations, mathematical Induction, An application: Hamming codes.

Unit 2:

Logic propositions: Truth and falsehood of propositions, basic operations, Boolean algebra, De Morgan's laws

Unit 3:

Propositional calculus: conjunctive and disjunctive normal forms, rules of inference, chain rule modusponens, chains of inference, tautology and contradiction, proof by adopting a premise.

Unit 4:

Predicate Calculus: Predicates, examples, quantifiers, the universal quantifier, the existential quantifier, combination of quantifiers, negating quantifiers, recursive definitions, recursive list processing.

Unit 5:

Graphs & Algorithms: Euler and the seven Bridges, Trees and Spanning Trees,

Prim's Alogorithm, Binary tree, tree searching, Euler's Theorem The Shortest-Path Problem, Dijkstra's Algorithm, All-Pairs Algorithms, Floyd's Algorithm, Warshall's Algorithm

Text books:

1. Introduction to Discrete Mathematics, Robert J McEliece, Robert B Ash and Carol Ash, McGraw-Hill
2. Discrete Mathematics and Structures, satinder Bal Gupta.

MICROPROCESSOR AND ITS APPLICATIONS

Semester : *IV*

Course No. : *B.Sc. IT 403(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

To impart basic information about computer hardware, working and programming of Intel 8086

Objectives of the Course

The student should be able to:

- Select the best hardware for their PC
- Upgrade their PCs
- Write simple 8086 programs

Unit 1:

Microprocessor architecture and its operations: microprocessor initiated operations and 8085 bus organization, internal data operations, 8085 registers, externally initiated operations. Memory - memory map, memory and instructions, peripheral mapped I/O, 8085 microprocessor and its architecture.

Unit 2:

8086 Internal architecture. Basic 8086 microcomputer system, system overview, 8086 bus, Read machine cycle, Write machine cycle, Assembly language programming - program development steps, 8086 instructions - data transfer instructions, arithmetic instructions, bit manipulation instructions, string instructions, program execution, Constructing the machine codes for 8086 instructions. Implementing standard program in 8086, unconditional jump instructions, condition flags, conditional jump instructions, If-then, If-then else, and multiple if-then-else , while-do , repeat-until, loop instructions, instruction timing and delay loops.

Unit 3:

Strings, Procedures and Macros - 8086 string instructions, writing and using procedures, CALL and RET instructions, stack, using PUSH and POP to save register contents, passing parameters, reentrant and recursive procedures, writing and using macros.

Unit 4:

8086 interrupts: program examples, interrupt Types, 8254 software, programmable TIMER/ COUNTER, basic 8253 and 8254 operations, 8259A Priority interrupt controller, Direct Memory Access data transfer - circuit connections and operations of the Intel 8257 DMA controller, DMA transfer timing diagram.

Unit 5:

Intel 80286 microprocessor: architecture, signals and system connections, Real address mode operation, protected mode operation. Intel 80386 32-bit microprocessor - architecture, pins and signals. Intel 80486 microprocessor. RISC machines.

Text Book

Microprocessors and Interfacing , Programming and Hardware, Douglas V- Hall. Tata McGraw-Hill.

References

Microprocessor 8086 programming & interfacing , A.nagoor Kani. RBA publications. The Intel Microprocessors 8086 / 8088 , 80186 / 80188 , 80286 , 80386 , 80486 , Pentium, and Pentium Pro processor Architecture, Programming and Interfacing - Barry B.Brey Prentice - Hall India.

COMPUTER NETWORKS

Semester : *IV*

Course No. : *B.Sc. IT 404(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provide a better understanding about the computer network and it also gives an insights into networking protocols

Objectives of the Course

- ❖ Familiarizing with different types of networking methodology
- ❖ To give a clear picture about the evolution of computer networking
- ❖ Get to familiarize

Unit 1:

se of computer networks: Hardware – LAN, MAN, WAN, Wireless network Internet works, Software – Protocol Hierarchies, Design issues for the layers, Interfaces, & Services, Connection Oriented and connectionless Services, Service primitives, Relationship of services to protocol. Reference models – OSI, TCP/IP, Comparison, Example networks- Novell Netware, Arpanet, Internet, Network topologies.

Unit 2:

Transmission media: Magnetic media, twisted pair Base band, broadband and fiber optic cables, Data link Layer, Design issues, Services Framing, Error and flow control. Error detection and correction, Elementary protocols, Unrestricted, Simplex stop and wait, Protocols, Unrestricted, Simplex stop and wait, Protocol for noisy channel.

Unit 3:

Static and dynamic channel allocations of LANS and MANS, ALOHA,CSMA and Collision free protocols, Network layer, design issued, Services, Internal organization, Virtual Circuits and datagram subnets, Routing algorithms, Optimality, Shortest path, Inter networking, Different networks, Concatenated virtual circuits, connectionless internet working Tunneling, Internet work routine, Fragmentation, Fire walls.

Unit 4:

Transport layer: Services, Quality of Service, service primitives, Elements of protocols, Addressing, Establishing and releasing connections, flow control, buffering, multiplexing, Crash recovery, Performance issues, performance problems, measuring improving etc, Fast TPDU processing, protocols for gigabit networking.

Unit 5:

Application layer: Name space, domain name system resolution, remote logging, electronic mail, File transfer and HTTP.

Text Book:

Computer Networks, Andrew S. Tanenbaum.

Reference:

Computer Network, Uyless Black, PHL.

Data Communications and Networking, Behrouz A. Ferguzan.

Data and Computer communications, William Stalling, Pearson Education

OPERATING SYSTEMS

Semester : *IV*

Course No. : *B.Sc. IT 405(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to make the student aware of operating systems and their services.

Objectives of the Course

On the completion of the course students will be able to

- Understand the basic services provided by an operating system
- Understand the basic features of operating systems
- Get awareness of different type of operating systems
- Learn the basic concept of process, process scheduling and interprocess communication

Unit 1:

Introduction: OS Functions, Computer System Organization, Computer System Architecture, Operating System Structure, Operating System Operations, Operating System Services, User Operating System Interface, System Calls, Types of System Calls.

Unit 2:

Process: Basic Concepts, Process Scheduling, Operations on Processes, Inter process communication, Process Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling.

Unit 3:

Process Coordination: Synchronization, The Critical Section problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Dead Locks, System Model, Dead Lock Characterization, Methods of Handling Dead Locks, Dead Lock Prevention, Dead Lock Avoidance, Dead Lock Detection, Recovery from Dead Lock.

Unit 4:

Memory Management: Memory Management Strategies, Swapping, Contiguous memory allocation, Paging, Segmentation, Virtual Memory Management, Demand paging, Copy - on - Write, Page Replacement

Unit 5:

Storage Management: File System, File Concept, Access Methods, Directory Structure, protection, Implementing File Systems, File System Structure, Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery.

Text book :

Operating System Principles, 7th Edition, Abraham Silberschatz, Peter Galvin and Greg Gagne, John Wiley

MICRO PROCESSOR - LAB

Semester : *IV*

Course No. : *B.Sc. IT 406(P)*

Course Type : *Core Lab*

Credits : *2*

Aim of the Course

Aim of the course is to develop microprocessor programming skill to the students.

Objectives of the Course

On the completion of the course students will be able to

- ❖ Handle microprocessor programming
- ❖ Familiarize with the assembly language

(Minimum four programs from each section and 10 hrs per section.)

- o Simple Arithmetic Calculations
- o Conditional Statements
- o Control Statements
- o Loop and Arrays
- o Character Strings
- o Subroutines and Stack Operations

COMPUTER GRAPHICS

Semester : *V*

Course No. : *B.Sc. IT 501(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to provide the students with the basic knowledge o computer graphics.

Objectives of the Course

On the completion of the course students will be able to:

- To understand the basic knowledge of graphics devices
- The awareness of 2D
- To get the basic concepts graphincs algorithms
- To learn the concepts of 3D

Unit 1:

Display devices, rastor, vector, pixel and point plotters, continual refresh and storage displays, plasma panel displays

Unit 2:

Display description: screen coordinates, user coordinates, two dimensional transformations, transformation matrix, composite transformations, segments-concepts, files, attributes

Unit 3:

Interactive graphics: Positioning and pointing devices (light pen, digitizer, mouse, track ball) Logical classification of devices, interactive graphical techniques, zooming, clipping, windowing, input functions

Unit 4:

Three dimensional representations, polygon surfaces, curved surfaces, three dimensional transformations- translation, rotation and scaling, reflection, shears

Unit 5:

General concepts of hidden surface and hidden lines, surface shading methods, graphic standard, G4S

Text Book:

Computer Graphics, Hearn D. & Baker M. P.

Reference:

1. Principles of Interactive Computer Graphics, Newman W. M.& R. F Sproul
2. Theory and Problems of Computer Graphics(Shaum;s Series), Plastock R. and XiangZ

JAVA PROGRAMMING AND INTERNET

Semester : *V*

Course No. : *B.Sc. IT 502(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

Aim of the course is to teach the students the basics of Java programming, HTML and Internet.

Objectives of the Course

On the completion of the course students will be able to:

- To learn the basics of Java programming
- To learn the concepts of applets, Packages and Interfaces
- To learn the different tags in HTML and the creation of web pages
- To understand the working of Internet

Unit 1:

Introduction to Internet – Definitions, Advantages, Browsers, Brief overview of server, URL definition, Introduction to WWW, uses, multimedia capabilities of www, commercial uses, client server architecture in internet, domain name, extension types, Internet services, features, Introduction to HTML, list, creating table, linking document, feature, font, colour and background colour, adding pictures to HTML documents

Unit 2:

Object Oriented Fundamental and Java Revolution – OOP, Encapsulation, Inheritance, polymorphism, Java Genesis, characteristics, how java different from c and C++, java and Internet, Java and WWW, Web browsers, overview of java, simple java programmes, structure, tokens, statements, JVM, operator precedence

Unit 3:

Constants, variables, data types, operators and expressions, decision making and branching, if, if…else, nested if, switch, ?: operator, decision making and looping, while, do, for, jumps in loops, labeled loops, classes, objects and methods

Unit 4:

Arrays, strings and vectors, constructors, Interfaces, multiple inheritance, packages, putting classes together, multithreaded programming, managing errors and exceptions, applet programming, graphics programming

Unit 5:

Managing input/output files in java, concepts of streams, stream classes, byte stream classes, character stream classes, using streams, I/O classes, file classes, I/O exceptions, creation of files, reading/writing characters, byte handling primitives, data types, random access files, JDBC (Java Database Connectivity), overview, implementation

Text Book:

- Programming with Java-APrimer, E. Balaguruswamy
- Internet Complete Reference, Harley Hahm

Reference:

- The Java Complete Reference, 3rd edition by Patrick Naughton, TATA Mc Graw-Hill
- E. Balaguruswami, Programming with Java, TATA Mc Graw Hill.

E-COMMERCE AND ITS APPLICATIONS

Semester : *V*

Course No. : *B.Sc. IT 503(T)*

Course Type : *Core*

Credits : *3*

Aim of the Course

Aim of the course is to provide an awareness of Electronic commerce environment and its opportunities

Objectives of the Course

- Give an overview of modes of electronic commerce
- To learn security issues related to E-Commerce
- Get an awareness of electronic transaction
- Understanding of Email technologies

Unit 1:

Electronic Commerce Environment & Opportunities: Basics, E-Commerce Environment, Electronic market place technologies, Modes of electronic commerce, Electronic data interchange, migration to open EDI, Electronic Commerce with WWW/Internet

Unit 2:

Approaches to Safe electronic commerce: Secure transactions, SEPP, Secure, electronic transactions, Certificate of authentification.

Unit 3:

Electronic Cash and electronic payment Schemes: Internet monetary and payment schemes, payment and purchase order process, on-line electronic cash.

Unit 4:

Internet/Intranet Security Issues and solution: The need for computer security, specific Intruder approaches, Security strategies, Encryption,

Unit 5:

Master Card/VISA secure electronic transaction: Concepts, Payment processing.

Unit 6:

E-mail -and secure E-mail Technologies: Multipurpose Internet Mail .Extensions, Secure Multipurpose Internet mail Extension, message Object Security Services.

Text Book:

Web Commerce Technology Handbook, Daniel Mindi and Emma Minoli, Tata McGraw-Hill Edition.

Reference:

1. E-Commerce - The cutting Edge of Business, Kamalesh K Bajaj & Debjani Dag, Tata me Graw Hill
2. Electronic Commerce (2nd Edition)- Pe.Ie Loshin and Paul A Murphy, Jaico Books.

MULTIMEDIA SYSTEMS

Semester : *V*

Course No. : *B.Sc. IT 504(T)*

Course Type : *Open Course(1)*

Credits : *4*

Aim of the Course

Aim of the course is to provide an awareness of the various technology used in the multimedia field

Objectives of the Course

- Give an overview of different file formats used in Video storage
- Give an overview of different file formats used in Audio storage
- Knowledge regarding the compression methods
- Knowledge regarding various storage devices

Unit 1:

Multimedia: Introduction, Multimedia Presentation and Production, Characteristics, Hardware and Software requirements, Uses of Multimedia, Analog Representation, Digital Representation, A-D conversion, D-A Conversion, Sampling Rate, Bit Depth, Quantization Error, Fourier Representation

Unit 2:

Text-Types, Font, Text Compression, File Formats, Image-Types, Color Models, Steps in image processing, Interface standards, Specifications of digital images, CMS, File Formats, Audio-Acoustics, Nature of Sound waves, Elements of Audio systems, MIDI, Sound Card, Audio File Formats, Video- Video camera, Transmission of video signals, Digital video standards, Video File formats

Unit 3:

Animation- Keyframes, Tweening, types, Animation on Web, 3D Animation, File Formats, Compression-CODEC, Lossless compression techniques, Lossy compression techniques, JPEG, MPEG-1 Audio, MPEG-1 Video, CD Technology, Compact Discs, Magneto Optical Disks, Laser Disc, DVD, DVD Formats

Unit 4:

Multimedia Architechure, User Interfaces, Hardware Support, Streaming Technologies, Object Oriented approach, Multimedia Documents, SGML, ODA, MPEG

Unit 5:

Multimedia Application Development, Software Life Cycle overview, Story, Flowline, Script, Storyboard, Case study, Virtual Reality-VR Applications, software requirements, VRML

Text Book:

Principles of Multimedia, Ranjan Parekli, Tata McgrawHill

Reference:

1. Digital Multimedia, Nigel Chapman & Jenny Chapman, Wiley Publications.
2. Multimedia Systems, Ralf Steinmetz and Klara Nahrstedt, Springer, 2004
3. Multimedia: Making it work, Tay Vaughan, Seventh Edition, Tata McGraw-Hill Publishing company Ltd, 2007
4. Multimedia Communication-Application Networks, Protocols and Standard Fred Halsall, Addison-Wesley, 2001.
5. Multimedia and Communication Technology, Steve Heath, Second Edition, Elsevier, 2003
6. Multimedia Bible, Rosen, Sams Publishing
7. Multimedia Literacy, Fred T. Hofsterter, 3rd Edition, Tata McGraw-Hill, 2005
8. Multimedia: Computing, Communications and Applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Education, 2006.

LINUX OS & PROGRAMMING

Semester : *V*

Course No. : *B.Sc. IT 504(T)*

Course Type : *Open Course(2)*

Credits : *4*

Aim of the Course

This course provides an awareness of Linux.

Objectives of the Course

- It provide basic architecture of Linux
- Understanding Linux Commands
- To learn concepts of file system in Linux
- To learn basic shell programming
- Understanding filter commands

Unit 1:

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell - Linux File system - Boot block, Super block, Inode table, Data blocks, Linux standard directories. Commands for files and directories – cd, ls, cp, rm, mkdir, rmdir, pwd, file, more, less, Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces. Partitioning the Hard disk drive for Linux, Installing the Linux system, System startup and shut-down process

Unit 2:

Essential Linux commands, Understanding shells, Processes in Linux, process fundamentals, connecting processes with pipes, redirecting input/output, Background processing, managing multiple processes, changing process priority, scheduling of processes. Batch commands, kill, ps, who, sleep. Printing commands, find, sort, touch, file, file processing commands - wc, cut, paste etc - mathematical commands - expr, factor etc. Creating and editing files with vi & joe editors

Unit 3:

System administration - Common administrative tasks, identifying administrative files– configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel - Backup and restore files, reconfiguration of hardware with kudzu, installing and removing packages with rpm command

Unit 4:

Shell programming - Basic of shell programming, various types of shell available in Linux, comparisons between various shells, shell programming in bash

Conditional and looping statements, case statement, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automating system tasks

Unit 5:

Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr - Filter using regular expressions – grep, egrep, and sed. Configuring X-windows desktop - Redhat configuration - Xfree86, understanding XF86config file, starting & using X desktop. KDE & GNOME graphical interfaces, changing X settings

Text books:

1. Red Hat Linux Bible, Cristopher Negus, Wiley Dreamtech India
2. UNIX Shell Programming, Yeswant Kanethkar, BPB

References :

1. Official Red Hat Linux User's guide, Redhat, Wiley Dreamtech India
2. UNIX for programmers and users, Graham Glass & King Ables, Pearson Education
3. Beginning Linux Programming, Neil Mathew & Richard Stones, Wiley Dreamtech India

MANAGEMENT INFORMATION SYSTEM

Semester : *V*

Course No. : *B.Sc. IT 504(T)*

Course Type : *Open Course(3)*

Credits : *4*

Aim of the Course

This course provides an awareness regarding the various management techniques used in information system and to know how it helps an organisation

Objectives of the Course

- To know what is a system
- To understand information system as an structured system
- To identify the components of Information system
- To have an idea regarding how it helps in the effective functioning of an organization

Unit 1:

Definition, elements of MIS, characteristics of MIS, structure of MIS, operating elements of information system, MIS structure based on management activity

Unit 2:

Management information: Definition, reduction of uncertainity, redundancy, types of management information, information for various levels of management, objectives of a system for communicating information, requisites of an effective information system, information resource management.

Unit 3:

Definition of system, general model, types of system, sub systems, system concept applied to MIS decisions, support system, expert system.

Unit 4:

Managing and controlling the MIS, effects of MIS on top management, effect of MIS on operating management.

Unit 5:

Data base: Definition, data base requirements, data base management systems.

Textbook:

Management Information System- Mano.

FINANCIAL ACCOUNTS AND TALLY

Semester : *V*

Course No. : *B.Sc. IT 504(T)*

Course Type : *Open Course(4)*

Credits : *4*

Aim of the Course

This course provides an awareness about the normal accounting practices

Objectives of the Course

- To prepare final accounts
- To use accounting software Tally

Unit 1:

Final Accounts of Sale Traders : Manufacturing, Trading and Profit and Loss Accounts, Balance Sheet, Adjustment of outstanding and unexpired Income and expense, depreciation and bad debts, bad debts recovered, discount and provision for discount for debtors and creditor, interest on capital and drawings, goods taken for personal use and office use, goods distributed as samples, goods destroyed by fire, transfer of reserve fund, adjustment for rectification and inter indebtedness in personal accounts

Unit 2:

Branch and Departmental Accounts: Branch-Objectives-Types-Accounts for branches-not keeping full systems of accounting-1)debtors system-2)stock and debtors system-Trading results of independent branches- Reconciliation of transit items- Incorporation of Branch trial balance in the H.O. Books, Departmental accounts including inter departmental transfers-Unrealized profit.

Unit 3:

Accounting for incomplete Records: Meaning- Features- Defects- Ascertainments of profit by conversion method-Preparation of Trading and Profit and Loss Account and Balance sheet.

Unit 4:

Royalty Accounts: Royalties - Minimum rent - short working – recovery - special circumstances - Adjustment of minimum rent - Sub Lease - Entries in the Books of Lessee and Lesser

Unit 5:

Self Balancing and Sectional Balancing

Unit 6:

Tally Accounting Package.

Text Book:

1. S. P. Jain and K. L. Narang
2. K. G. C. Nair

JAVA - LAB

Semester : *V*

Course No. : *B.Sc. IT 505(P)*

Course Type : *Core Lab*

Credits : *3*

JAVA PROGRAMMING IN LINUX ENVIRONMENT

[There will be two questions, first (30 marks) from Part I and second (45 marks) from Part II]

Part I

1. HTML Programs (Formatting tags, table tag, **form** tags, frame tags)
2. Applet Programs (graphics, awt, swing)

Part II

3. Programs using Arrays
4. Programs using Method overloading
5. Programs using Method Overriding
6. Programs using Constructor Overloading
7. Programs using Inheritance
8. Programs using Packages
9. Programs using Abstract Classes
10. Programs using Interfaces

(Inputs should be given using command line arguments or IO streams)

MINI PROJECT

Semester : *V*
Course No. : *B.Sc. IT 506(P)*
Course Type : *Core Project*
Credits : *3*

Mini project shall be a small, yet complete project in Database design/ creation & access/ management etc so as to make the student confident in designing using techniques learnt in ***System Analysis & Design*** course and developing projects using **VB** and **SQL Server/ ORACLE.** A neat report on the work has to be prepared in standard format and submitted.

WEB TECHNOLOGY

Semester : *VI*

Course No. : *B.Sc. IT 601(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

The aim of the course is to provide the student with the basic knowlwdge of HTML, DHTML, XML, PHP and SQL

Objectives of the Course

On completion of the course students should be able:

- To understand the basic knowledge of web oriented languages
- The awareness of scripting language
- To understand the basic concept of HTML
- To learn the concept of PHP
- To get the awareness of SQL

Unit 1:

Introduction to DHTML, document object model, features, XML, using XML, tax, scripting, XML document type description, XML and .net technologies, XML in other web application, WAP and XML.

Unit 2:

Introduction to Java script, advantages, syntax, data type, variable, array, operator and expression, looping constructs, function, dialogue box, Java script document object model.

Unit 3:

Introduction, object in HTML, event handling, window object, document object, browser object, form object, navigator object, screen object, built in object, user defined object, cookies.

Unit 4:

PHP, building clocks, variables, data types, operators and expressions, contents, flow control functions, working with functions, arrays. Working with objects, strings, date and time, working with forms, working with file uploads, working with cookies and user sessions, working with files and directories, working with images.

Unit 5:

Understanding the data base design process, the importance of good data base design, types of table relationship, understanding normalization, learning basic SQL commands, string functions in mySQL, date and time functions in mySQL, using transaction and stored procedure in mySQL, interacting with mySQL using PHP, connection to mySQL with PHP, working with mySQL data.

Textbook:

1. HTML, Java Script, DHTML, Perl, CGI- Ivan Bayross.
2. Teach yourself XML in 21 days- Simon North Hermans, SAMS Publication.
3. PHP, mySQL and Apache- Julie C Meloni, SAMS Teach yourself, Pearson Education.

Reference:

The web warrior guide to the web programming- Xve Bai Michael Ekedahl, Thomson.

CLIENT/SERVER TECHNOLOGY

Semester : *VI*

Course No. : *B.Sc. IT 602(T)*

Course Type : *Core*

Credits : *4*

Aim of the Course

The aim of the course is to impart information on Client/Server applications

Objectives of the Course

- To know about client computer and its uses
- To know about sever and its uses
- Networking of client and server
- Future trends of Client and server application

Unit 1:

Overview of client/server computing, application tasks, right sizing, benefits of Client/Server computing, evolution, hardware trends, software trends, evolution of operation systems, networking trends, business considerations.

Unit 2:

Client/Server applications, components, classes of Client/Server applications, categories of Client/Server applications, obstacles, open systems and standards, standards setting organizations, factors for success.

Unit 3:

Client hardware and software, client components, client operating systems, GUI, database access, application logic, server hardware and environment, categories of servers, features of server machines, classes of servers.

Unit 4:

Network management environment, network computing environment, network operating systems, loadable modules, client and server requirements, GUI design standards, interface independence, platform independence, transaction processing, connectivity, reliability, back up and recovery mechanisms.

Unit 5:

Future trends, mobile computing, network management standard, intelligent wiring hubs, wireless LANs, ATM switching, object technology, CASE tools, repositories, multimedia, work group computing.

Textbook:

Client/Server Computing- Dauna Tracis Dewire, McGraw Hill.

Reference:

1. Client/Server Computing: Architecture, Applications and Distributed Systems Managements- Elbert B. and Martyna B., Artech House.
2. The Essential Client/Server Survival Guide- Robert Orfa, Dan Harkey and Jeri Edwards, John Wiley and Sons

NETWORK SECURITY AND CRYPTOGRAPHY

Semester : *VI*

Course No. : *B.Sc. IT 603(T)*

Course Type : *Choice based Core Course(1)*

Credits : *4*

Aim of the Course

This course provides an awareness regarding the threats and security measures applicable to networking

Objectives of the Course

- To know about threats exists in the networking field
- To know the causes of these threats
- To provide the solutions to these insecurities in the networking environment
- To imparts idea regarding cryptography

Unit 1:

Service mechanism and attacks - The OSI security architecture - A model for network security - symmetric Cipher model - Substitution techniques - transposition techniques- simplified des - block chipper principles - the strength of des - block chipper design principles and modes of operation.

Unit 2:

Triple des-blow fish - RCS Advanced Symmetric Block Ciphers -RC4 stream Cipher confidentially using symmetric encryption - introduction to number theory – public key cryptography and RSA.

Unit 3:

Key management - Diffle Hellman key exchange - message authentication and hash function - hash algorithm - digital signature and authentication protocols – digital signature standard.

Unit 4:

Authentication application - pretty good privacy - S/MIME - ip security - web

security considerations - secure socket layer transport layer security- secure electronic transaction.

Unit 5:

Intruders -intrusion detection - password management -viruses and related threats- virus countermeasures - fire wall design principles - trusted systems

Textbook:

William Stallings, "Cryptography and Network Security Principles and Practices". Fourth edition, phi Education Asia.

Reference:

1. Atul kahate "Cryptography and Network Security" second edition. TMH.
2. Behrouz A.forouzan" Cryptography and Network Security " TMH.

DATA MINING

Semester : *VI*

Course No. : *B.Sc. IT 603(T)*

Course Type : *Choice based Core Course(2)*

Credits : *4*

Aim of the Course

This course provides an awareness regarding the concept datamining and the various methods adopted in it.

Objectives of the Course

- To know what is data mining
- To know about data warehousing
- To know how datamining is done
- To impart an idea regarding latest trends in this field

Unit 1:

Data mining: Data mining functionalities, classification of data mining system, major issues in data mining, data warehouse and OLAP technology for data mining, data warehouse, a multidimensional data model, data warehouse architecture, data warehouse implementation, further development of data cube technology, from data warehousing to data mining

Unit 2:

Data pre-processing: Data cleaning, data integration and transformation, data reduction, discretisation and concept hierarchy generation, datamining primitives, languages and system architecture: A data mining query language, designing graphical user interface basd on a data mining query language, architecture of data mining system.

Unit 3:

Concept description: characterisation and comparison, data generalization and summarization based characterization, analytical characterisation, analysis of attribute relevance, mining class comparison, discriminating between different classes, mining descriptive statistical measures in large databases, mining association rules in large

data bases, association rule mining, mining single dimensional Boolean association, rules from transaction data bases, mining multilevel association rules from transaction data bases, mining multidimensional rules from relational data bases and warehouses.

Unit 4:

Applications and trends in data mining: data mining applications, data mining system products and research prototypes, additional themes on data mining, social impacts of data mining, trends in data mining.

Text Book:

Data Mining – Han Kamper

MOBILE COMPUTING

Semester : *VI*

Course No. : *B.Sc. IT 603(T)*

Course Type : *Choice based Core Course(3)*

Credits : *4*

Aim of the Course

This course provides an overview on various methodology and technology adopted in mobile computing field

Objectives of the Course

- To know generally about mobile computing
- Basic idea regarding the protocols used in this field of application
- To know about WML
- To distinguish between computer and mobile technology
- To know about Wireless Telephony Applications

Unit 1:

The Rise of mobile data: Market convergence Enabling convergence – Key services the mobile internet: Overview of the wireless application protocol: The origins of WAP – overview of the WAP architecture – components of the WAP standard – network infrastructure services supporting WAP clients – WAP architecture design principles – relationship to other standards.

Unit 2:

The wireless markup language : overview – the WML documents model – WML authoring – URL's identity content – Markup basics - WML – basics – basics content – events, trash and bindings.

Unit 3:

Variables – other content you an include – controls – miscellaneous markup – sending information – application security – other data: The meta element – document type declarations – error and browser limitations – content generation – WML version negotiation.

Unit 4:

User interface design: Making wireless applications, easy to user web site design computer terminals Vs mobile terminals – designing a usable WAP site – structured usability methods – User interface design guidelines – design guidelines for selected WML elements.

Unit 5:

Wireless telephony applications: Overview of the WTA Architecture – WTA Client Framework – WTA Server & Security – Design Considerations – Application Creation Toolbox – Further WTA Enhancements, The Mobile internet Future: Better Content, Easier Access – Beyond Browsing – Beyond Cellular – Mobile Data Unleashed.

Text Book:

The WAP - Sandeep Singhal, Thomas Bridgram, Lalitha Suryanarayana, Daniel Mauney, Jari Aluinen, David Bevis, Jim Chan, Stefan Hild, Pearson Education 2003.

BIOINFORMATICS

Semester : *VI*

Course No. : *B.Sc. IT 603(T)*

Course Type : *Choice based Core Course (4)*

Credits : *4*

Aim of the Course

This course provides an awareness regarding latest applied branch called Bioinformatics and its uses

Objectives of the Course

- To know about the primary biological cell structure
- Distinguish between RNA and DNA
- To know about Genetic Code and its mapping techniques
- To know how it is stored in the databases
- To know about various applications used in this field

Unit 1:

Biology for Bioinformatics: Basic concepts - cells- Archaebacteria, Biomembranes, Nucleus, Organelles, Mitochondria., Chloroplasts, Viruses, BacterioPhage, Genetic contents of a cell - Viral Proteins - Amino acid, DNA and RNA, Forms of DNA.

Unit 2:

Genetic Code: Genome, Gene Expressions, Protein Synthesis, Transcription RNA, Processing, Capping, Splicing, Editing, Cell Signaling, DNA cloning Genomic library, cDNA library, Probes, Screening.

Unit 3:

Databases: Characteristics of Bioinformatics, Database - Categorizing, Navigating, Information retrieval systems, Sequence Database, Structure Databases.

Unit 4:

Other Databases: EnzymeDatabases, MEROPS, ERENDA, Pathway Databases: CAZy, Disease Database, Literature Databases, Other Specified Databases

Unit 5:

Phython for Bioinformatics

Text book:

1. Bioinformatics Databases, Tools, Algorithms, Oxford University Press
2. Learning Phython, Mark Lutz, David Ascher, O'Reilly

References :

1. Introduction to Bioinformatics, T. R. Attwood, D J Pany-Smith., Pearson Education Essential Bioinformatics, Jin Xiong, Cambridge University Press.
2. Fundamental Concepts of Bioinformatics, Dan E. Krane, Michael L. Raymer, Pearson Education.

GENERAL SEMINAR

Semester : *VI*
Course No. : *B.Sc. IT 604(P)*
Course Type : *Core Seminar*
Credits : *2*

The student shall choose a modern topic oc current day from Computer Science, Information Technology and present a seminar using appropriate presentation media such as LCD projector, OHP etc. A seminar report in bound form in the pattern of a complete technical report (with contents page, well structured presentation, references etc.) shall be submitted.

PROJECT + COURSE VIVA

Semester : *VI*
Course No. : *B.Sc. IT 605(P)*
Course Type : *Core Project*
Credits : *4*

The project topic shall be chosen from areas of current day interest using latest packages/ languages running on appropriate platforms, so that the student can be trained to meet the requirements of the Industry. A bonafied project report shall be submitted in hard bound complete in all aspects. For internal evaluation, the progress of the student shall be systematically assessed through two or three stages of evaluation at periodic intervals.

In Course Viva, the student is to be assessed on,the basis of his knowledge in all the subjects taught in the curriculum as well as topics of current day interest in the pertinent areas.