L. N. GOVERNMENT COLLEGE

(AUTONOMOUS)
PONNERI – 601204

DEPARTMENT OF COMPUTER SCIENCE

B.Sc., Computer Science

SYLLABUS

Effect from the Academic Year 2018-19
(Regulations – 3.0)

L. N. GOVERNMENT COLLEGE (AUTONOMOUS), PONNERI – 601204
DEPARTMENT OF COMPUTER SCIENCE

B.Sc DEGREE COURSE IN COMPUTER SCIENCE SYLLABUS
(Effective from the Academic Year 2018-19)

SEMESTER - 1

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
UAF1C	GT	1	Tamil	3	4	25	75	100
17UBF1A	GE	1	English	3	4	25	75	100
18UFM1A	MT	1	Digital Electronics and Microprocessors	5	5	25	75	100
17UGA1D	AT	1	Mathematics - 1	5	5	25	75	100
18UFM11	MP	1	Digital Electronics and Microprocessors Lab	2	4	40	60	100
17USS1A	SS	1	Essential of Language of Communication	2	2	40	60	100
18UFN1A	NT	1	PC Software	2	2	25	75	100
				24	30			700

SEMESTER – 2

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
UAF2C	GT	2	Tamil	3	4	25	75	100
17UBF2A	GE	2	English	3	4	25	75	100
18UFA2D	MT	2	Programming in C	5	5	25	75	100
17UGA2D	AT	2	Mathematics - 2	5	5	25	75	100
18UFM21	MP	2	Programming in C Lab	2	4	40	60	100
17USS2A	SS	2	Essential of Spoken & Presentation Skills	2	2	40	60	100
18UFN21	NP	2	PC Software LAB	2	2	25	75	100
				22	30			00

SEMESTER – 3

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
UAF3C	LE	3	Tamil	3	4	25	75	100
17UBF3A	LT	3	English	3	4	25	75	100
18UFM3A	MT	3	C++ Using Data structures	5	6	25	75	100
17UHA3A	AT	3	Physics - 1	4	9	25	75	100
18UFM31	MP	3	Prog. with Data Structure using C++ Lab	2	5	40	60	100
	SS	3	Personality Enrichment	2	2	40	60	100
				19	30			600

SEMESTER – 4

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
UAF4C	LE	4	Tamil	3	4	25	75	100
17UBF4A	LT	4	I. English	3	4	25	75	100
18UFM4A	MT	4	Programming with Java	5	5	25	75	100
17UHA4A	AT	2	Physics - 2	5	5	25	75	100
18UFM41	MP	4	Programming with Java Lab	2	4	40	60	100
17UHA41	AP	1	Physics Lab	2	4	40	60	400
18USS4B	SS	3	Analytical Skill and Aptitude	2	2	40	60	100
UEN4F	EVS	1	Environmental Studies	2	2	25	75	100
				22	30			700

SEMESTER – 5

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
18UFM5A	MT	5	Operating System	3	6	25	75	100
18UFM5B	MT	6	Computer Organisation and Architecture	3	6	25	75	100
18UFM5C	MT	7	DBMS and Visual Basic	5	6	25	75	100
18UFM51	MP	5	RDBMS Lab	2	5	40	60	100
18UFE5A		a	Internet and its Applications					
18UFE5B	SE 1	b	E-Commerce	5	5	25	75	100
18UFE5C		c	Multimedia					
VED5F	VE	1	Value Education	2	2	25	75	100
				20	30			700

SEMESTER – 6

Subject Code	Subject Type		Subject Code	Credits	Lecture Hours	IM	EM	Max Marks
18UFM6A	MT	8	Data Communication and Networking	5	6	25	75	100
18UFM6B	MT	9	Web Technologies	5	6	25	75	100
18UFM61	MP	6	Web Technologies Lab	2	4	40	60	100
18UFE6A		a	Data Mining					
18UFE6B	SE 2	b	Computer Graphics	5	5	25	75	100
18UFE6C		c	Cloud Computing					
18UFE6D		a	Software Engineering					
18UFE6E	SE 3	b	Software Project Management	5	5	25	75	100
18UFE6F		c	Software Testing					
UXT6F	EA	1	Extension Activities	1	2	25	75	100
				23	30			600

GT – General Tamil;	GE – General English;	LT – Language Tamil;	LE – Language English;
MT – Major Theory;	AT – Allied Theory;	MP – Major Practical;	AP – Allied Practical;
SE – Subject Elective;	VE – Value Education;	EA – Extension Activities;	SS – Softskill;
NT – Non-major Theory;	NP – Non-major Practical;		

LOGANATHAN NARAYANASAMY GOVT. COLLEGE (AUTONOMOUS), PONNERI

BACHELOR OF COMPUTER SCIENCE DEGREE COURSE

CHOICE BASED CREDIT SYSTEM.
(Effective from the academic year 2011 – 2012)

REGULATIONS

1. ELIGIBILITY FOR ADMISSION:

Candidates for admission to the first year of the Degree of Bachelor of Science courses shall be required to have passed the Higher Secondary Examinations (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted as equivalent thereof by the Syndicate of the University of Madras. The candidate should have Computer Science/ Mathematics / Statistics/ Business Mathematics as one of the subjects with or without Computer Science in Higher Secondary Examinations.

2. ELIGIBILITY FOR THE AWARD OF DEGREE:

A candidate shall be eligible for the award of the Degree only if he /she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years, passed the examinations all the Six-Semesters prescribed earning 140 Credits (in Parts-I, II, III, IV & V).

3. DURATION:

a)   Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters and the third academic year the fifth and sixth semester respectively.

b)   The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year. There shall be not less than 90 working days for each semester.

4. MEDIUM OF INSTRUCTION

The medium of Instruction and Examination (Written and Viva) shall be English.

5. COURSE OF STUDY:

The main Subject of Study for Bachelor Degree Courses shall consist of the following and shall be in accordance with **APPENDIX-A**

PART – I   TAMIL / OTHER LANGUAGES
PART – II   ENGLISH
PART – III   CORE SUBJECTS
             ALLIED SUBJECTS
             PROJECT/ELECTIVES WITH THREE COURSES

PART – IV

1.
   a. Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two courses (level will be at 6th Standard).
   b. Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses.
   c. Others who do not come under a + b can choose non-major elective comprising of two courses.

2.   SKILL BASED SUBJECTS (ELECTIVE) - (SOFT SKILLS)

3.   ENVIRONMENTAL STUDIES

4   VALUE EDUCATION

PART – V   EXTENSION ACTIVITIES

6. EXTENTION ACTIVITIES:

A candidate shall be awarded a maximum of 1 Credits for Compulsory Extension Service.

All the Students shall have to enrol for NSS /NCC/ NSO (Sports & Games) Retract/ Youth Red cross or any other service organizations in the college and shall have to put in   Compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years.

Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will ONE CREDIT.

Literacy and population Education Field Work shall be compulsory components in the above extension service activities.

7. SCHEME OF EXAMINATION:

Scheme of Examination shall be given as follows:

Model Scheme

Course Component Name of the course	Inst. Hour	Credits	Exam	Max. Marks		
				Ext.mark	Int. mark	Total
PART-I: Language				**75**	**25**	**100**
PART-II: English				**75**	**25**	**100**
PART-III: Core subject :				**75**	**25**	**100**
Core Subject				**75**	**25**	**100**
Allied Subject				**75**	**25**	**100**
PART – IV 1.(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard). (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses. (c) Others who do not come under a + b can choose non-major elective comprising of two courses.						
2*Skill based subjects(Elective) – (Soft Skill)						

The following procedure be be followed for Internal Marks:
Theory Papers: Internal Marks 25

INTERNAL MARKS

Tests (2 out of 3)	10
Attendance	**5**
Seminars	**5**
Assignments	**5**
Marks	**25**

Break-up Details for Attendance

Below 60%	No Marks
60% - 75%	3 Marks
76% to 90 %	4 Marks
91% to 100%	5 Marks

Practical:

Internal Marks	40 Marks
Attendance	5 Marks
Practical Test best 2 out of 3	30 Marks
Record	5 Marks

Project:

Internal Marks best 2 out of 3 Presentations	20 Marks
Viva	20 Marks
Project Report	60 Marks

8. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER:

i. Candidates shall register their names for the First Semester Examination after the admission in UG Courses.

ii. Candidates shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subject of earlier semesters along the current (subsequent) Semester Subjects.

iii. Candidates shall be eligible to go to subsequent semester, only if they earn, sufficient attendance as prescribed therefor by the Syndicate from time to time.

Provided in case of a candidate earning less than 50% of attendance in any one of the Semesters due to any extraordinary circumstances such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the college, shall be permitted to proceed to the next semester and to complete the Course of study. Such Candidates shall have to repeat the missed Semester by re-joining after completion of Final Semester of the course, after paying the fee for the break of study as prescribed by the University from time to time.

9. PASSING MINIMUM:

A candidate shall be declared to have passed:

a) There shall be no Passing Minimum for Internal.
b) For External Examination, Passing Minimum shall be of 40% (Forty Percentage) of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-voce.
c) In the aggregate (External + Internal) the passing minimum shall be of 40%.
d) He/she shall be declared to have passed the whole examination, if he/she passes in all the papers and practical wherever prescribed / as per the scheme of examinations by earning 140 CREDITS in Parts-I, II, III, IV & V. He/she shall also fulfil the extension activities prescribed earning a minimum of 1 Credit to qualify for the Degree.

10. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

PART- I TAMIL / OTHER LANGUAGES

TAMIL/OTHER LANGUAGES: Successful candidates passing the Examinations for the Language and securing the marks (1) 60 percent and above and (ii) 50 percent and above but below 60 percent in the

aggregate shall be declared to have passed the examination in the FIRST and SECOND class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART – II ENGLISH

ENGLISH: Successful candidates passing the examinations for English and securing the marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD class.

PART – III consisting of CORE SUBJECTS, ALLIED SUBJECTS, PROJECT / ELECTIVE with three courses:

Successful candidates passing the examinations for Core Courses together and securing the marks (i) 60 percent and above (ii) 50 percent and above but below 60 percent in the aggregate of the marks prescribed for the Core courses together shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examinations in the Third Class.

PART – IV (consisting of sub items 1 (a), (b) & (c), 2, 3 and 4) as furnished in the Regulations 4 Part-IV supra.

PART – V EXTENTION ACTIVITIES:

Successful Candidate earning of 1 credit SHALL NOT BE taken into consideration for Classification/Ranking/ Distinction.

11. RANKING:

Candidates who pass all the examinations prescribed for the course in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking/ Distinction.

Provided in the case of Candidates who pass all the examinations prescribed for the Course with a break in the First Appearance due to the reasons as furnished in the Regulations. 7 (iii) supra are only eligible for classification.

12. TRANSITORY PROVISION:

Candidates who have undergone the course of study prior to the academic year 2008 – 2009 will be permitted to appear for the examinations under those Regulations for a period of TWO years i.e. up to and inclusive of April/May 2012 Examinations. Thereafter, they will have permitted to appear for the examination only under the Regulations then in force.

Question Paper Pattern

SECTION – A (30 words)
10 OUT OF 12   -   10 X 2 marks   = 20 marks

SECTION – B (200 words)
5 out of 7   -   5 x 5 marks = 25 marks

SECTION – C (500 words)
3 out of 5   -   3x 10 marks = 30 marks

TOTAL = 75 marks

QUESTION PAPER FOR PRACTICALS

The external examiner will prepare a question paper on the spot with the help of the Question Bank supplied by the Controller's office.

APPENDIX – A

COURSE OF STUDY

Course of Study shall comprise the study of Part-I to Part-V Courses; .

PART - I   TAMIL/OTHER LANGUAGES comprise the study of:

Tamil or any one of the following Modern (Indian or Foreign) or classical languages at the optional candidate, according to the syllabi and text-books prescribed from time to time.

(i)	Modern (Indian)	- Telugu, Kannada, Malayalam, Urdu & Hindi.
(ii)	Foreign	- Chinese, French, German, Italian, Japanese, & Russian
(iii)	Classical	- Sanskrit, Arabic & Persian.

AND

PART – II   ENGLISH according to the syllabi and text-books prescribed from time to time.

PART – III   CORE COURSES Comprise the study of (A) Main Subjects; (B) Allied Subjects;

(C) Project / Electives with three courses:

(A) MAIN SUBJECTS:

Main Subjects [core courses] of B.Sc. COMPUTER SCIENCE are under the FACULTY OF SCIENCE:

(B) ALLIED SUBJECTS:

Each candidate shall choose the Allied subjects prescribed in the Scheme of Examinations.

(C) PROJECT / ELECTIVES with Three Courses

PART – IV

1. (a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two courses (level will be at 6th Standard).
(b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses. (c)
Others who do not come under a + b can choose non-major elective comprising of two courses.

2. SKILL BASED SUBJECTS (ELECTIVE) - (SOFT SKILLS)

3. ENVIRONMENTAL STUDIES

4 VALUE EDUCATION

  PART – V EXTENSION ACTIVITIES

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B.Sc DEGREE COURSE IN COMPUTER SCIENCE

SYLLABUS

SEMESTER – 1

MAJOR THEORY - 1

Title of the Course/Paper	**Digital Electronics and Microprocessors**		
Major Theory	**I Year & I Semester**	**Credit: 5**	**SUB CODE:18UFM1A**
Objective of the course	This course introduces the concepts of fundamentals of Digital Electronics and Microprocessor.		
Course outline	**Unit 1**: Binary Systems & Code conversion, Boolean Algebra & Logic Gates – Truth Tables – Universal Gates – Simplification of Boolean functions: SOP, POS methods – K-map.		
	Unit 2: Combinational Logic: Adders & Subtractors – Multiplexer – De-multiplexer - Encoder – Decoder. Flip-Flops, J-K Flip-Flop		
	Unit 3: Introduction to Microprocessors, Microcomputers, and Assembly Language – Microprocessor Architecture and Its Operations – Memory – I/O Devices – 8085 MPU – Introduction to 8085 Instructions – Data Transfer Operations – Addressing Modes - Arithmetic, Logic and Branch Operations – Writing Assembly Language Programs.		
	Unit 4: Time Delay Programs: Time Delay Using One Register – Using a Register Pair – Counter Design with Time Delay – Stack and Subroutines.		
	Unit 5: 8085 Interrupt – Vectored Interrupts – Interfacing I/O Devices: Basic Interfacing Concepts – Direct I/O - Memory-Mapped I/O.		
Outcomes	a. Study the Architecture of 8085 microprocessors b. Study the Architecture of 8086 and 8088 microprocessors3. To learn the design aspects of I/O and Memory Interfacing circuits c. Learn the design aspects of I/O and Memory Interfacing circuits d. Study about communication and bus interfacing e. Study the Architecture of 8051 microcontroller		

Text Books:
1) M. Morris Mano, "Digital Logic and Computer Design", Prentice-Hall of India Pvt. Ltd.
2) Ramesh S. Gaonkar, "Microprocessor Architecture, Programming", and Applications with the 8085, Penram International Publishing (India) Pvt. Ltd.

Reference Books:
1) D. P. Leach and A. P. Malvino, "Digital Principles and Applications", Tata McGraw, Hill Publishing Co. Ltd.
2) V. Vijayendran, "Digital Fundamentals",S. Viswanathan (Printers & Publishers) Pvt. Ltd.
3) N. K. Srinath, "8085 Microprocessor Programming and Interfacing",Prentice-Hall of India Pvt. Ltd.

MAJOR PRACTICAL - 1

Title of the Course/ Paper	**Digital Electronics and Microprocessors Lab**		
Major Practical	**I Year & I Semester**	**Credit: 2**	**SUB CODE: 18UFM11**
Objective of the course	This course gives training on the experiments of Digital Electronics and Microprocessor 8085.		
Course outline	**DIGITAL ELECTRONICS:** 1. Verification of Truth Table for AND, OR, NOT, NAND, NOR and EX-OR gates. 2. Realization of NOT, AND, OR, EX-OR gates with only NAND and only NOR gates. 3. Karnaugh Map Reduction and Logic Circuit Implementation. 4. Verification of Demerger's Law. 5. Implementation of Half-Adder and Half-Subtractor. 6. Implementation of Full-Adder and Full-Subtractor. **MICROPROCESSOR:** 1. 8 Bit Addition and Subtraction. 2. 16 Bit Addition. 3. BCD Addition. 4. BCD Subtraction. 5. 8 Bit Multiplication. 6. BCD Multiplication. 7. 8 Bit Division. 8. Searching for an Element in an Array. 9. Sorting in Ascending and Descending Orders. 10. Finding Largest and Smallest Elements from an Array. 11. Reversing Array Elements. 12. Block Move.		

NON-MAJOR ELECTIVE - 1

Title of the Course/Paper	**Fundamentals of Information Technology**		
Non-Major Elective	**I Year & I Semester**	**Credit: 2**	**SUB CODE: 18UFN1A**
Objective of the course	To teach the basics of Computer and algorithm writing.		
Course Outline	**Unit 1:** Introductory concepts: History - Generation - Classification Block diagram - Memory units – Auxiliary storage devices – Magnetic Disk – Magnetic Tape – Compact Disk – Input devices –Output Devices-Operating systems		
	Unit 2: Database Management Systems - Programming languages – C, C++, Java - Steps to write a program – Algorithm – Flow Chart - Flow chart symbols Algorithms and Flowcharts: Even or Odd – Fahrenheit to Celsius-Conversion – Area of a Square – Area of a Rectangle – Simple interest.		
	Unit 3: Algorithms and Flowcharts: Biggest among the given three numbers – Roots of the Equation – Printing the Series 1+2+3+4…. +n and 1+3+5+…+n Sum of the given n numbers		

Text Book:

Alexis Leon and Mathews Leon, "Fundamentals of Information Technology", Vikas,

Reference Books:

1. Willams, Sawyer and Hutchinson, "Using Information Technology", Tata McGraw Hill.
2. Ananthi Sheshasaayee and G. Sheshsaayee. "Programming Languages with Practicals", Margham Publications.

NON-MAJOR ELECTIVE - 2

Title of the Course/Paper	PC SOFTWARE		
Non-Major Elective	**I Year & I Semester**	**Credit: 2**	**SUB CODE: 18UFN1B**
Objective of the course	This course gives an introduction to computer and Office automation software.		
Course Outline	**Unit 1:** Introduction to Computer **-** Definition of Computer, Characteristics of Computers hardware, software, block diagram of a personal computer. **MS-Word:** 1. Creating a document – Copying and moving text – Formatting the document (Font, Paragraph, Bullets & Numbering, Page Setup) 2. Inserting Page breaks – Page Numbers – Pictures – Application of Header & Footer. 3. Creating Tables – Entering Text – Formatting table – Using Formulas 4. Mail Merge – Letter – label – Envelope		
	Unit 2: Ms-Excel: 1. Create Database – Formatting Cells – Insert Row, Column 2. Creating a table for Payroll program using formulas – Conditional Formatting 3. Creating a table for Result processing by using Conditional statements – Aligning text & Numbers. 4. Creating Database – Sort Records – Filter 5. Create Pivot Table Report		
	Unit 3: Ms- PowerPoint 1. Create a new presentation using Blank presentation – Formatting text and applying designs and background of slide 2. Create a new presentation using Templates – Apply Custom animation, Slide Transition, 3. Sound effect – View show 4. Create a new presentation using Auto Content Wizard – apply Rehearse Timing –Setup Show – Speaker Notes		

Text Book:

Anandhi Seshasayee, "Elements of computer Applications".

Reference Books:
1) Vikas Gupta, "Comdex Computer Course Kit (XP Edition)", Dreamtech publish, NewDelhi.
2) Yadav, "Brilliants Ms-Office 2000".

SEMESTER – 2

MAJOR THEORY - 2

Title of the Course/Paper	**Programming in C**		
Major – 2	**I Year & II Semester**	**Credit: 5**	**SUB CODE: 18UFM2A**
Objective of the course	This course gives insight into the Programming in C for selected problems.		
Course outline	**Unit 1:** C fundamentals Character set - Identifier and keywords - data types - constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and logical, Assignment and Conditional Operators - Library functions.		
	Unit 2: Data input output functions - Simple C programs - Flow of control - if, if else, while, do-while, for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator.		
	Unit 3: Functions –Definition - proto-types - Passing arguments - Recursions. Storage Classes - Automatic, External, Static, Register Variables – Multi-file programs.		
	Unit 4: Arrays - Defining and Processing - Passing arrays to functions – Multi-dimension arrays - Arrays and String. Structures - User defined data types - Passing structures to functions - Self-referential structures – Unions - Bit wise operations.		
	Unit 5 : Pointers - Declarations - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files : Creating , Processing ,Opening and Closing a data file, Command Line Arguments.		
Outcomes	a. Write, compile and debug programs in C language b. Use different data types in a computer program c. Design programs involving decision structures, loops and functions d. Explain the difference between call by value and call by reference e. Explain the difference between call by value and call by reference		

Text Book:

E.Balaguruswamy, "Programming in ANSI C", TMH Publishing Company Ltd.

Reference Books:

1) B.W. Kernighan and D.M.Ritchie, "The C Programming Language", PHI.
2) H. Schildt, C, The Complete Reference, TMH
3) Gottfried,B.S, "Programming with C, TMH Pub. Co. Ltd., New Delhi.
4) Kanetkar Y., "Let us C", BPB Pub., New Delhi.

MAJOR PRACTICAL - 2

Title of the Course/Paper	**Programming in C Lab**		
Practical – 2	**I Year & II Semester**	**Credit: 3**	**SUB CODE: 18UFM21**
Objective of the course	This course train the students to solve the problems using C language		
Course outline	1. To generate prime numbers within a range 2. To calculate standard deviation 3. To find whether a given number is perfect or not 4. Write a program to find whether the given number is palindrome or not 5. Write a program to count the number of positive, negative and zero 6. To generate the Fibonacci series using recursive function. 7. To convert Binary to decimal 8. To find the largest and smallest number in a given list of numbers 9. To solve the Quadratic Equation 10. To check whether the element is present in the given list or not 11. To find the factorial of a given number using function declaration 12. To sort names in alphabetical order 13. To sort numbers in ascending order		

NON-MAJOR ELECTIVE PRACTICAL - 1

Title of the Course/Paper	**PC Software Practical**		
Non-Major Elective	**I Year & II Semester**	**Credit: 2**	**SUB CODE: 18UFN21**
Objective of the course	This course gives an exposure to Various Software of Office Package		

Course Outline	**MS-WORD**
	   1. Text Manipulations.
	   2. Usage of Numbering, Bullets, Footer and Headers.
	   3. Usage of Spell check and Find & Replace.
	   4. Text Formatting.
	   5. Picture insertion and alignment.
	   6. Creation of documents, using templates.
	   7. Creation templates
	   8. Mail Merge Concepts
	   9. Copying Text & Pictures from Excel
	
	MS-EXCEL
	  10. Cell Editing
	  11. Usage of Formulae and Built-in Functions
	  12. File Manipulations
	  13. Data Sorting (both number and alphabets)
	  14. Worksheet Preparation
	  15. Drawing Graphs
	  16. Usage of Auto Formatting
	
	POWER POINT
	  17. Inserting Clip arts and Pictures
	  18. Frame movements of the above
	  19. Insertion of new slides
	  20. Preparation of Organisation Charts
	  21. Presentation using Wizards
	  22. Usage of design template		

SEMESTER - 3

MAJOR THEORY – 3

Title of the Course/Paper	**Programming in C++ and Data Structures**		
Major Theory	**II Year & III Semester**	**Credit: 5**	**SUB CODE: 18UFM3A**
Objective of the course	This course introduces the basic concepts of programming in C++ and Data Structures		
Course outline	**Unit 1:** Introduction to C++; Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++; Arrays - Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - Inline Functions - Friend and Virtual Functions		
	Unit 2: Classes and Objects; Constructors and Destructors; and Operator Overloading and Type Conversions - Type of Constructors - Function overloading. Inheritance: Single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism		
	Unit 3: Working with Files: Classes for File Stream Operations - Opening and Closing a File - End-of-File Deduction - File Pointers - Updating a File Data Structures: Definition of a Data structure - primitive and composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.		
	Unit 4: Stacks - Applications of Stack - Infix to Postfix Conversion, Recursion, Queues - Operations on Queues, Queue Applications, Circular Queue. Singly Linked List - Operations, Application - Representation of a Polynomial, Polynomial Addition;		
	Unit 5: Trees and Graphs: Binary Trees - Operations – Recursive Tree Traversals- Graph - Definition, Types of Graphs, Graph Traversal – DFS and BFS		
Outcomes	a. Understand and apply the notions of hashing, trees and binary search trees b. Know the efficiency of algorithms with respect to the choice of data structures c. Understand the basic concepts of object-oriented programming d. Develop C++ programs for simple applications		

Text Books:

1) E.Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill Publishing Company Ltd.
2) E.Horowitz and S.Shani, "Fundamentals of Data Structures in C++ ", Galgotia Pub.

Reference Books:

1) Robert Lafore, "Object Oriented Programming in Microsoft C++", Galgotia publication.
2) H.Schildt, C++,"The Complete Reference-1998-TMH Edition".
3) Scymar Lipschutz and G.A Vijayalakshmi Pai, "Schaum's Outlines, Data Structures", Tata McGraw-Hill.
4) Cangsam,Auguenstein,Tenenbaum,"Data Structures using C & C++",PHI
5) D.Samantha, "Classic Data Structures", PHI,New Delhi.

MAJOR PRACTICAL - 3

Title of the Course/ Paper	Data Structures Using C++ Lab		
Major Practical	**II Year & III Semester**	**Credit: 3**	**SUB CODE: 18UFM31**
Objective of the course	This course deals with practical implementation of Data Structure using C++.		
Course outline	1. Write a Program using constructor 2. Create a program using Inheritance 3. Write a C++ program for overloading of functions. 4. Implement PUSH, POP operations of stack 5. Implement add, delete operations of a queue 6. Conversion of infix to postfix using stack operations 7. Postfix Expression Evaluation. 8. Addition of two polynomials. 9. Binary tree traversals (in-order, pre-order, and post-order) using linked list. 10. Depth First Search and Breadth first Search for Graphs using Recursion.		

SEMESTER - 4

MAJOR THEORY - 4

Title of the Course/Paper	**Programming in Java**		
Major – 4	**II Year & IV Semester**	**Credit: 5**	**SUB CODE: 18UFM4A**
Objective of the course	This course gives insight into the Programming in C for selected problems.		
Course outline	**Unit 1:** Introduction to Java-Features of Java-Basic Concepts of Object Oriented Programming-Java Tokens-Java Statements-Constants-Variables-Data Types- Type Casting-Operators-Expressions-Control Statements: Branching and Looping Statements.		
	Unit 2: Classes, Objects and Methods – Constructors - Methods Overloading-Inheritance-Overriding Methods - Finalizer and Abstract Methods-Visibility Control –Arrays, Strings and Vectors-String Buffer Class-Wrapper Classes.		
	Unit3: Interfaces-Packages-Creating Packages-Accessing a Package-Multithreaded Programming-Creating Threads-Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Priority		
	Unit 4: Managing Errors and Exceptions-Syntax of Exception Handling Code-Using Finally Statement-Throwing Our Own Exceptions-Applet Programming-Applet Life Cycle-Managing Input/ Output Files: Concept of Streams-Stream Classes-Byte Stream Classes-Character Stream Classes – Using Streams-Using the File Class-Creation of Files-Random Access Files.		
	Unit 5: Java Utility Classes-Introducing the AWT: Working with Windows, Graphics and Text- AWT Classes- Working with Frames-Working with Graphics-Working with Color-Working with Fonts-Using AWT Controls, Layout Managers and Menus.		
Outcomes	a. Solve computational problems using basic constructs like if-else, control structures, array, and strings. b. Understand how to model real world scenario using class diagram. a. Exhibit communication between 2 objects using sequence diagram. b. Implement relationships between classes		

Text Books:

1) E.Balagurusamy, "Programming with JAVA", Tata McGraw-Hill Publishing Co.Ltd.
2) Herbert Schildt, "The Complete Reference Java^{TM} 2", Tata McGraw-Hill Publishing Co. Ltd. (Unit V)

Reference Books:

1) Y. Daniel Liang, 2003, "An Introduction to JAVA Programming", Prentice-Hall of India Pvt. Ltd.

2) Cay S. Horstmann and Gary Cornell, "Core Java^{TM} 2 Volume I-Fundamentals", Pearson Education.
3) Ken Arnold, James Gosling and David Holmes, "The Java^{TM} Programming Language", Pearson Education.

MAJOR PRACTICAL - 4

Title of the Course/Paper	**Java Programming Lab**		
Practical - 4	**II Year & IV Semester**	**Credit: 3**	**SUB CODE: 18UFM41**
Objective of the course	This course gives the practical training in JAVA programming		
Course outline	**Write a Java Program to implement the following concepts** 1. Classes and objects 2. Constructor overloading 3. Multilevel inheritance using super() method 4. Implementation of multiple inheritance using interface 5. Creation and implementation of packages 6. Exception using multiple catch 7. Creation of user defined exception 8. Multi thread program 9. Vector class 10. Calendar class **Applet programs** 11. Write an applet program for addition of two numbers 12. Draw various shapes using Graphics class 13. Write a program to demonstrate events using controls 14. Write a program for Menus 15. Write a program for layout managers		

SEMESTER - 5

MAJOR THEORY – 5

Title of the Course/ Paper	**Operating Systems**		
Major Theory	**III Year & V Semester**	**Credit: 5**	**SUB CODE: 18UFM5A**
Objective of the course	This course introduces the basic concepts of database management systems		
Course outline	Unit 1: Introduction: Views –Goals –Types of system – OS Structure – Components – Services - System Structures – Layered Approach -Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling – Cooperating Process –Threads - Inter-Process Communication. CPU Scheduling: CPU Schedulers – Scheduling criteria – Scheduling Algorithms		
	Unit 2:– Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlock: Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock.		
	Unit 3: Memory Management: Address Binding – Dynamic Loading and Linking – Overlays – Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation. Non-Contiguous Allocation: Paging and Segmentation schemes –Implementation – Hardware Protection – Sharing - Fragmentation.		
	Unit 4: Virtual Memory: Demand Paging – Page Replacement - Page Replacement Algorithms – Thrashing. – File System: Concepts – Access methods – Directory Structure –Protection Consistency Semantics – File System Structures – Allocation methods – Free Space Management.		
	Unit 5: I/O Systems: Overview - I/O Hardware – Application I/O Interface – Kernel I/O subsystem – Transforming I/O Requests to Hardware Operations – Performance. Case Study: Linux		
Outcomes	a. Understand how computing resources (such as CPU and memory) are managed by the operating system, describe the basic principles used in the design of modern operating systems b. Know the full range of considerations in the design of file systems, summarise techniques for achieving synchronisation in an operation system, Explain the objective and functions of modern operating systems c. Evaluate and report appropriate design choices when solving real-world problems d. Analyse the key trade-offs between multiple approaches to operating system design		

Text Book:

1. Silberschatz A., Galvin P.B. Gange, "Operating System Principles", John Wiley & Sons.

Reference Book:

1. H.M. Deitel, "An Introduction to Operating System", Addison Wesley.

MAJOR THEORY - 6

Title of the Course/ Paper	**Computer Organization and Architecture**		
Major Theory	**III Year & V Semester**	**Credit: 5**	**SUB CODE: 18UFM5B**
Objective of the course	This course introduces the Concepts of Computer Organization and Architecture.		
Course outline	**Unit 1:** Basic Computer and Organization Design: Instruction Codes – Registers – Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions - Input Output and Interrupt.		
	Unit 2: Programming the Basic Computer: Machine Language – Assembly Language – The Assembler – Program Loops – Programming Arithmetic and Logic Operations – Subroutines – Control Memory – Address Sequencing.		
	Unit 3: Micro operations: Register transfer language, Register transfer, Bus and Memory transfer, Arithmetic, logic, and shift micro operations, Arithmetic logic shift unit - micro programmed control - control memory - Address sequencing		
	Unit 4: Central processing unit: General register and stack organizations, instruction formats - Addressing modes, Data transfer and manipulation - program control, RISC - Pipelining - Arithmetic and instruction, RISC pipeline.		
	Unit 5: Input-output organization - peripheral devices, I/O interface, modes of transfer- Interrupt, Direct memory access, I/O processor.		
Outcomes	a. Understand the structure and functioning of a digital computer, including its overall system architecture, operating system, and digital components. b. Analyse the generic principles that underlie the building of a digital computer, including data representation, digital logic and processor programming c. Apply some fundamental coding schemes d. Present and discuss simple examples of assembly language appropriate for an introductory course.		

Text Books:
1. M.M. Mano, "Computer System Architecture", Prentice-Hall of India Pvt. Ltd., New Delhi.
2. D. P. Leach and A. P. Malvino, "Digital Principles and Applications", Tata McGraw-Hill, New Delhi.

Reference Books:
1. M. Morris Mano, "Digital Logic and computer Design", Prentice-Hall of India Pvt. Ltd., New Delhi.
2. V. C. Hamacher, G.Vranesic, S. G.Zaky, "Computer Organization", Tata McGraw-Hill, New Delhi.
3. J. P.Hayes, "Computer architecture", Tata McGraw-Hill, New Delhi.

MAJOR THEORY – 7

Title of the Course/ Paper	**DBMS and Visual Basic**		
Major Theory	**III Year & V Semester**	**Credit: 5**	**SUB CODE: 18UFM5C**
Objective of the course	This course introduces the DBMS Concepts with Visual Programming.		
Course outline	**Unit 1:** Advantages and Components of a Database Management Systems – Feasibility Study – Class Diagrams – Data Types – Events – Normal Forms 1,2,3 & BCNF		
	Unit 2: Query Basics – Computation Using Queries – Subtotals and GROUP BY Command – Queries with Multiple Tables – Subqueries – Joins – DDL & DML – Testing Queries: Database Administration – Development Stages – Application Types – Backup and Recovery – Security and Privacy.		
	Unit 3: The Visual Basic Integrated Development Environment – Toolbar - Form Properties – Events – Variables – Data types - Constants – Operators - User-Defined Data Types - First VB Project - Toolbox Revisited: Creating controls - Textbox – Label - Command Button - Access Keys - Check Box - Radio button - Frame control.		
	Unit 4: Programming Constructs: Displaying output on the form – Decision making - Looping construct – Arrays **-** Dynamic arrays **-** Static Arrays - Array Operations. Functions and Procedures: Built in Functions - User defined functions - Sub procedures. Advanced Controls: List and combo boxes - Flex Grid. Interfaces: Message Box - Input Box - Common dialog controls –Menu - MDI form.		
	Unit 5: Database Programming: Database Interface - Open Database Connectivity (ODBC) - Create a Data Source.		
Outcomes	a. Describe the structure and functioning of a digital computer, including its overall system architecture, operating system, and digital components. b. Explain the generic principles that underlie the building of a digital computer, including data representation, digital logic and processor programming c. Apply some fundamental coding schemes d. Present and discuss simple examples of assembly language appropriate for an introductory course.		

Text Books:
1. G.V.Post,"Database Management Systems Designing and Building Business Application" ,McGraw Hill International.
2. Gary Cornell, "Visual Basic 6 from the Ground up", Tata McGraw Hill.

Reference Books:
1) Raghu Ramakrishnan, "Database Management Systems", WCB/McGraw Hill.
2) C.J. Date," An Introduction to Database Systems",Addison Wesley.
3) Noel Jerke,"Visual Basic 6 (The Complete Reference)", Tata McGraw Hill.
4) Deitel & Deitel, "Visual Basic 6 How to Program", Pearson Education.
5) Nick Showdon, "Oracle Programming with Visual Basic", Sybex publication.
6) Treitch, "Visual Basic Oracle 8 Programmer's Reference", Wrox publication.

MAJOR PRACTICAL - 5

Title of the Course/ Paper	**DBMS and Visual Basic Lab**		
Major Practical	**III Year & V Semester**	**Credit: 4**	**SUB CODE: 18UFM51**
Objective of the course	This course train the students to implement the database applications		

Course outline	1. Exercise on queries with DDL, DML and DCL commands.
	
	2. Exercise on sub queries and joins
	
	3. Programming in PL/SQL
	
	4. Use Functions and Procedures in PL/SQL
	
	5. Use Triggers in PL/SQL
	
	Create database and performing the operations given below using a Menu Driven program: (a) Insertion, (b) Deletion, (c) Modification, (d) Generating a reports (Simple) for the following Systems using any RDBMS package:
	
	    1) Payroll
	    2) Mark sheet Processing
	    3) Savings bank account for banking
	    4) Student information system
	    5) Electricity bill preparation system		

SUBJECT ELECTIVE – 1 A

Title of the Course/Paper	**Internet & Its Applications**		
Elective	**III Year & V Semester**	**Credit: 5**	**SUB CODE: 18UFE5A**
Objective of the course	This course gives an exposure to internet concepts		
Course outline	**Unit 1**: Introduction to Computers Programming Language Types History of Internet Personal Computers History of World Wide Web- Micro software .NET Java-Web resources.		
	Unit 2: Web Browsers- Internet Explorer- connecting to Internet Features of Internet explorer6 Searching the Internet- online help and tutorials- File Transmission Protocol (FTP) Browser settings.		
	Unit 3: Attaching a file, Electronic mail Creating an E-mail id Sending and Receiving mails attaching a file- Instance messaging - other web browser.		
	Unit 4: Introduction to HTML headers – Linking – Images – special characters and line breaks – unordered lists – simple HTML programs		
	Unit 5: E-marketing consumer tracking Electronic advertising search engine-CRM- credit card payments Digital cash and e-wallets micro payments- smart card		
Outcomes	• Understand the basic principles of creating websites and has knowledge about the architecture of web applications. • Knowledge of the basic scripting languages used to implement web applications. • Able to design and implement a dynamic website using a scripting language and customize the appearance according to the graphic design. • Able to use technologies such as CSS, JavaScript, jQuery, etc.		

Text Book:

1. H.M.Deitel, P.J. Deitel and A.B.Goldberg,"Internet and World Wide Web",PHI

Reference Book:

1. Harley hah, "The Internet - Complete Reference", Tata McGraw Hill.
2. "How the Internet works",Techmedia,Preston Gralla Millenium Edition.

SUBJECT ELECTIVE – 1B

Title of the Course/Paper	E-Commerce		
Elective	**III Year & V Semester**	**Credit: 5**	**SUB CODE: 18UFE5B**
Objective of the course	This course introduces the details about the concepts of E-Commerce		
Course outline	**Unit 1:** History of E-commerce and Indian Business Context: E-Commerce-Emergence of the Internet – Emergence of the WWW – Advantages of E-Commerce – transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporate. Business Models for E-Commerce: Business Model – E-business Models based on the relationship of transaction parties – E-business models based on the relationship of transaction types.		
	Unit 2: Enabling technologies of the World Wide Web: World Wide Web – Internet Client-Server Applications – Networks and Internets – Software Agents – Internet Standards and Specifications – ISP – e-Marketing: Traditional Marketing – Identifying Web Presence Goals – Online Marketing – E-advertising – E-branding.		
	Unit 3: e-Security: Information system security – Security on the Internet – E-business Risk Management Issues – Information Security Environment in India; Legal and Ethical Issues: Cyber stalking – privacy is at Risk in the Internet Age-Phishing – Applications Fraud – Skimming – copyright – Internet Gambling – Threats to Children.		
	Unit 4: e-Payment Systems: Main Concerns in Internet Banking- Digital Payment Requirements Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment systems – Designing e-Payment Systems – Digital Signature – Online Financial Services in India – Online Stock Trading.		
	Unit 5: Information systems for Mobile Commerce: What is Mobile Commerce? – Wireless Applications – Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies – Different Generations in Wireless Communication – Security Issues Pertaining to Cellular Technology. Portals for E-Business: Portals – Human Resource Management – Various HRIS Modules.		
Outcomes	• Understanding of basic concepts, theories, and business models underlying e-commerce • Apply e-commerce theory and concepts to what e-marketers are doing in "the real world" • Improve familiarity with current challenges and issues in e-commerce		

Text Book:
P.T.Joseph, S.J., "E-Commerce-An Indian Perspective", Fourth Edition, PHI.

Reference Books:
1. David Whitley, "E-Commerce Strategy,Technologies and Applications", Tata Mc-Graw-Hill.
2. Daniel Minoli & Emma Minoli,"Web Commerce Technology Handbook", TataMcGraw-Hill.
3. K. Bajaj & D. Nag, "E-Commerce", TataMcGraw-Hill.

SUBJECT ELECTIVE – 1C

Title of the Course/Paper	**Multimedia Systems**		
Elective	**III Year & V Semester**	**Credit: 4**	**SUB CODE: 18UFE5C**
Objective of the course	**This course introduces the basic concepts of Multimedia Systems.**		
Course outline	Unit 1: Introductory Concepts: Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia – The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain.		
	Unit 2: Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.		
	Unit 3: Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, Flash, Photoshop Etc.,		
	Unit 4:Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW – Web Servers, Web Browsers, Web page makers and editors, Plug-Ins and Delivery Vehicles, HTML, VRML, Designing for the WWW – Working on the Web, Multimedia Applications – Media Communication, Media Consumption, Media Entertainment, Media games.		
	Unit 5: Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing, Assembling and delivering a project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM technology.		
Outcomes	a. Implement basic graphics transformation and projection techniques. b. Design an application that incorporates different concepts of various colour models c. Apply and explore new techniques in the areas of compression techniques d. Appreciate the use of multimedia authoring tools and multimedia compression techniques		

Recommended Texts
1. S. Heath, 1999, Multimedia & Communication Systems, Focal Press, UK.
2. T. Vaughan, 1999, Multimedia: Making it work, 4th Edition, Tata McGraw Hill, New Delhi.
3. K. Andleigh and K. Thakkar, 2000, Multimedia System Design, PHI, New Delhi.

Reference Books
1. Keyes, "Multimedia Handbook", TMH, 2000.
2. R. Steinmetz and K. Naharstedt, 2001, Multimedia: Computing, Communications & Applications, Pearson, Delhi.
3. S. Rimmer, 2000, Advanced Multimedia Programming , PHI, New Delhi..

SEMESTER – 6

MAJOR THEORY – 8

Title of the Course/Paper	**Data Communication and Networking**		
Major Theory	**III Year & VI Semester**	**Credit: 4**	**SUB CODE: 18UFM6A**
Objective of the course	This course introduces the details about basic concepts of data communication and networking.		
Course outline	Unit 1: Introduction to Data Communication, Network, Protocols & standards and standards organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.		
	Unit-2: Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.		
	Unit 3**:** Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet - Token Bus - Token Ring - FDDI - IEEE 802.6 - SMDS - Circuit Switching - Packet Switching - Message switching - Connection Oriented and Connectionless services.		
	Unit-4: History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM - ATM Topology - ATM Protocol.		
	Unit-5: Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.		
Outcomes	• Understand Basic concepts of Data Communication and networking • Understand good network design: simplicity, scalability, performance, of OSI Reference Model, TCP/IP & ATM. • Understand the concepts of Connection Devices of DCN • Judge the effectiveness of existing or similar network protocols • Understand how the Internet works today		

Recommended Texts

1. Behrouz and Forouzan,2001,Introduction to Data Communication and Networking, 2nd Edition,TMH.

Reference Books

1. Jean Walrand 1998,Communication Networks (A first Course),Second Edition, WCB/McGraw Hill.
2. Behrouz and Forouzan,2006,Data Communication and Networking,3nd Edition ,TMH.

MAJOR THEORY – 9

Title of the Course/ Paper	Web Technologies		
Major Theory	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFM6B**
Objective of the course	This course introduces the concepts of ASP, VB Script, Java Script.		
Course outline	**Unit 1:** Introduction to` VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object		
	Unit 2: Introduction to JavaScript – Advantages of JavaScript – JavaScript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .		
	Unit 3: JavaScript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.		
	Unit 4: ASP.NET Language Structure – Page Structure – Page event, Properties & Compiler Directives. HTML server controls – Anchor, Tables, Forms, and Files. Basic Web server Controls – Label, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.		
	Unit 5: Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives, error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates		
Outcomes	a. Understand modern protocols and systems used on the Web (such as HTML, HTTP, URLs, CSS) b. Know the functions of clients and servers on the Web, and describe the strengths and weaknesses of the client-server internet approaches to web design and implementation program c. Access, and manipulate data through the adoption of accepted standards, mark-up languages, client-side programming, and server-side programming d. Design and implement an interactive web site(s) with regard to issues of usability, accessibility and internationalisation design and implement a client-server internet application that accommodates specific requirements and constraints, based on analysis, modelling or requirements specification		

Text Books:
   1) I.Bayross, "Web Enable Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI", BPB Publications.
   2) A.Russell Jones, "Mastering Active Server Pages 3", BPB Publications.

Reference Books:
   1) Hathleen Kalata, "Internet Programming with VBScript and JavaScript", Thomson Learning

2) Mike McGrath, "XML Harness the Power of XML in easy steps", Dreamtech Publications
3) T.A. Powell, "Complete Reference HTML", TMH.
4) J.Jaworski, "Mastering JavaScript", BPB Publications.

MAJOR PRACTICAL - 6

Title of the Course/ Paper	**Practical – VI: Web Technologies Lab**		
Core	**III Year & VI Semester**	**Credit: 4**	**SUB CODE: 18UFM61**
Objective of the course	To train the students in developing scripting programs in VB, ASP and Java		

Course outline	**Java Script**
	1) Create a calculator in Javascript.
	2) Write a Hit Counter program in Javascript.
	3) Create a program to verify whether email address provided by user is valid or invalid.
	4) Write a Palindrome program using Javascript.
	5) Create a Pop-up program using Javascript.
	6) Write a program in Javascript the form consists of four links with four colours, when the user clicks the link the background colour changes
	7) Write a script to create a digital clock.
	8) Write a Zoom-in Zoom-out program using Image in Javascript.
	9) The form consists of two multiple choice list and one single choice list
	  a) the first multiple choice list displays the major dishes available.
	  b) the second Multiple choice list display the stocks available.
	  c) The single choice list displays the miscellaneous (Milkshakes, soft drinks, softy available etc.)
	ASP.NET
	1) Write a Asp.net program to Create a Login Form that expires in 100 Seconds.
	2) Write a Asp.net program to implement Request and Response.
	3) Write a Asp.net program to create Mouse Events.
	4) Write a Asp.net program to create a document without toolbar, address bar and status bar.
	5) Write a Asp.net program to implement Employee database with all validation.		

SUBJECT ELECTIVE – 2A

Title of the Course/Paper	**Data Mining**		
Elective	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFE6A**
Objective of the course	This course introduces the fundamental concepts of Data Mining.		
Course outline	Unit1: Introduction: Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Pre-Processing: Pre-processing the Data – Data cleaning – Data Integration and Transformation – Data Reduction		
	Unit-2: Data Mining, Primitives, Languages and System Architecture: Data Mining – Primitives – Data Mining Query Language, Architectures of Data Mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures.		
	Unit 3: Mining Association Rules: Basics Concepts – Single Dimensional Boolean Association Rules from Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.		
	Unit-4: Classification and Prediction: Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy.		
	Unit-5: Cluster Analysis: Introduction – Types of Data in Cluster Analysis, Petitioning Methods – Hierarchical Methods Density Based Methods – GRID Based Method – Model based Clustering Method.		
Outcomes	a. Demonstrate advanced knowledge of data mining concepts and techniques. Apply the techniques of clustering, classification, association finding, feature selection and visualisation on real world data b. Determine whether a real world problem has a data mining solution c. Apply data mining software and toolkits in a range of applications d. Set up a data mining process for an application, including data preparation, modelling and evaluation		

Recommended Texts

1. J.Han and M. Kamber,2001,Data Mining Concepts and Techniques, Harcourt India Pvt. Ltd - New Delhi.

Reference Books

1. K.P. Soman , Shyam Diwakar, V.Ajay ,2006, Insight into Data Mining Theory and Practice, Prentice Hall of India Pvt. Ltd - New Delhi.

SUBJECT ELECTIVE 2B

Title of the Course/Paper	**Computer Graphics**		
Elective	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFE6B**
Objective of the course	This course introduces the fundamental concepts of Graphics.		
Course outline	**Unit 1:** Introduction to Computer Graphics: Brief Survey of Computer Graphics – Graphics Systems: Video Display Devices – Types – Raster-Scan Systems and Random-Scan Systems – Input Devices – Hard-Copy Devices – Graphics Software.		
	Unit 2: Output Primitives and their Attributes**:** Line-Drawing (DDA and Bradenham's) Algorithms – Circle-Generating (Midpoint) Algorithm – Ellipse-Generating (Midpoint) Algorithms- Line Attributes - Color and Grayscale Levels – Character Attributes – Inquiry Functions.		
	Unit 3: Two-Dimensional Transformations and Viewing: Basic Transformations - Matrix Representations and Homogeneous Coordinates – Composite Transformations - Other Transformations – Window-to- Viewport Coordinate Transformation – Clipping Algorithms: Cohen-Sutherland Line Clipping and Sutherland- Hodgeman Polygon Clipping		
	Unit 4: Three-Dimensional Concepts: Three-Dimensional Display Methods: Parallel and Perspective Projections – Depth Cueing - Visible Line and Surface Identification – Polygon Surfaces: Polygon Tables, Plane Equations and Polygon Meshes - Three-Dimensional Transformations: Basic		
	Unit 5: Three-Dimensional Viewing: Viewing Pipeline and Coordinates – Transformation from World to Viewing Coordinates – Projection Transformations - Matrices - View Volumes - Hidden Surface and Hidden Line Elimination Methods		
Outcomes	• Design two-dimensional graphics. - Apply two dimensional transformations. • Design three-dimensional graphics. - Apply three dimensional transformations. • Apply Illumination and color models. - Apply clipping techniques to graphics. - Design animation sequences.		

Text Book:

D. Hearn and M.P. Baker, "Computer Graphics, Pearson Education, Prentice Hall.

Reference Books:

1) S. Harrington, "Computer Graphics", McGraw-Hill Book Co.
2) W.M. Newman and R.F. Sproull, "Principles of Interactive Computer Graphics", Tata McGraw-Hill Publishing Co. Ltd.
3) D.P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", Prentice-Hall of India Pvt. Ltd.
4) N. Krishnamurthy, "Introduction to Computer Graphics", Tata McGraw-Hill Publishing Co. Ltd.

SUBJECT ELECTIVE 2C

Title of the Course/ Paper	Cloud Computing		
Elective	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFE6C**
Objective of the course	This course introduces the fundamental concepts of Cloud Computing		
Course outline	**Unit 1:** UNDERSTANDING CLOUD COMPUTING: Cloud Computing History of Cloud Computing Cloud Architecture Cloud Storage Why Cloud Computing Matters Advantages of Cloud Computing Disadvantages of Cloud Computing Companies in the Cloud Today Cloud Services.		
	Unit 2: DEVELOPING CLOUD SERVICES: Web-Based Application Pros and Cons of Cloud Service Development Types of Cloud Service Development Software as a Service Platform as a Service Web Services On-Demand Computing Discovering Cloud Services Development Services and Tools Amazon Ec2 Google App Engine IBM Clouds		
	Unit 3: CLOUD COMPUTING FOR EVERYONE: Centralizing Email Communications Collaborating on Schedules Collaborating on To-Do Lists Collaborating Contact Lists Cloud Computing for the Community Collaborating on Group Projects and Events Cloud Computing for the Corporation.		
	Unit 4: USING CLOUD SERVICES: Collaborating on Calendars, Schedules and Task Management Exploring Online Scheduling Applications Exploring Online Planning and Task Management Collaborating on Event Management Collaborating on Contact Management Collaborating on project Management Collaborating on Word Processing - Collaborating on Databases Storing and Sharing Files.		
	Unit 5: OTHER WAYS TO COLLABORATE ONLINE: Collaborating via Web-Based Communication Tools Evaluating Web Mail Services Evaluating Web Conference Tools Collaborating via Social Networks and Groupware Collaborating via Blogs and Wikis		
Outcomes	a. Understand the fundamental principles of distributed computing b. Understand how the distributed computing environments known as Grids can be built from lower level services. c. Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing d. Understand the business models that underlie Cloud Computing		

REFERENCES
1) 1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2) Haley Beard, Cloud Computing Best Practices for Managing and Measuring

SUBJECT ELECTIVE - 3A

Title of the Course/Paper	**Software Engineering**		
Elective	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFE6D**
Objective of the course	**To gain knowledge about the methodologies behind the software engineering and testing and to better understand the software development life cycle.**		
Course outline	**Unit 1:** Introduction: Definition of software and software engineering – Software myths – Software Engineering paradigms: Linear Sequential Model & Prototyping Model Software Project Management – Software Metrics – Software Cost Estimation – Software Project Planning.		
	Unit 2: Software Requirement Analysis: Software Risks – Software Configuration Management System Analysis – Modelling the System Architecture – System Specification – Fundamentals of Requirement Analysis – Software Prototyping – Prototyping method sand tools specification – Software requirements Specifications		
	Unit 3: Structured Analysis: Introduction – the elements of the analysis model – data objects, attributes and relationships – Cardinality and Modality – ERD – DFD – Classical Analysis Methods: DSSD, JSD, SADT.		
	Unit 4: Software Design: Software Design and Software Engineering – Design and Software Quality – Evolution of Software Design – Design Principles. Design Concepts, Abstraction, Refinement, Modularity – Effective Modular Design, Functional Independence, Cohesion, Coupling.		
	Unit 5: Software Testing Methods: Software Testing Fundamentals – White Box Testing – Black Box Testing – Debugging – Software Quality: McCall's Quality Factors		
Outcomes	a. Manage object-oriented and classical software construction projects including planning, scheduling, and risk assessment/management. b. Write software requirement documents with the appropriate content c. Author formal specifications for software systems d. Demonstrate proficiency in rapid software development techniques		

Recommended Books:

1. Roger S. Pressman "Software Engineering – A Practioner's Approach" McGraw Hill , 4th Edition

Reference books:

1. "Software Engineering – Design Reliability and Management" by Richard Fairley
2. "Software Engineering " by Sommerville, Pearson Education, 7th Edition

SUBJECT ELECTIVE 3B

Title of the Course/Paper	**Software Project Management**		
Elective	**III Year & VI Semester**	**Credit: 5**	**SUB CODE: 18UFE6E**
Objective of the course	**To gain knowledge about the methodologies behind the software project management.**		
Course outline	**Unit 1:** Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Matrices		
	Unit 2: Software Configuration Management – Definitions and terminology – processes and activities – Configuration audit – Matrices – Software Quality assurance – definitions – quality control and assurance – SQA Tools – Organisation of Structures - Risk Management – Risk Identification, quantification Monitoring – Mitigation		
	Unit 3: Project initiation – Project Planning and tracking – what, cost, when and how – organisational processes – assigning resources – project tracking – project closure – when and how.		
	Software requirements gathering – steps to be followed – skills sets required – challenges – matrices – Estimation 3 phases of estimation – formal models for size estimation – translating size estimate to effort schedule estimate, matrices – Design and Development phases – reusability, Technology choices, Standards, Portability user interface – testability – diagnosable etc.		
	Unit 5: Project Management in testing phase – in the maintenance phase – Impact on internet on project Management		
Outcomes	a. Understand the activities during the project scheduling of any software application b. Learn the risk management activities and the resource allocation for the projects c. Apply the software estimation and recent quality standards for evaluation of the software projects d. Acquire knowledge and skills needed for the construction of highly reliable software project e. Create reliable, replicable cost estimation that links to the requirements of project planning and managing		

TEXT BOOK
1. Gopalaswamy Ramesh, "Managing Globle Software Projects" Tata McGraw Hill Publishing Company, New Delhi

REFERENCE
1. Bob Hughes and Mike Cotterell "Software Project Management"5th edition, Tata McGraw Hill Publishing Company, New Delhi, 2002.

SUBJECT ELECTIVE – 3C

Title of the Course/Paper	**Software Testing**		
Elective	**III Year & VI Semester**	**Credit: 4**	**SUB CODE: 18UFE6F**
Objective of the course	This course introduces the Concepts of Software Testing		
Course outline	**Unit 1**: Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.		
	Unit2: Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques – Data Flow Testing Strategies		
	Unit 3: Domain Testing: Domains and Paths – Domains and Interface Testing – Linguistic –Metrics – Structural Metric – Path Products and Path Expressions.		
	Unit 4: Syntax Testing – Formats – Test Cases – Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.		
	Unit 5: Verification and Validation – Fundamental Tools - Levels of Testing – Testing Approaches – Types of Testing – Test Plan – Software Testing Tools: WinRunner – Silk Test		
Outcomes	a. Test the software by applying testing techniques to deliver a product free from bugs b. Evaluate the web applications using bug tracking tools. c. Investigate the scenario and the able to select the proper testing technique d. Explore the test automation concepts and tools e. Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma		

Text Books

1. B. Beizer , 2003, Software Testing Techniques, II Edn., DreamTech India, New Delhi.
2. K.V.KK. Prasad , 2005, Software Testing Tools, DreamTech. India, New Delhi.

Reference Books

1. Burnstein, 2003, Practical Software Testing, Springer International Edn.
2. E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
3. R.Rajani, and P.P.Oak, 2004, Software Testing, Tata Mcgraw Hill, New Delhi.

ENVIRONMENTAL STUDIES PROGRAMME

Unit 1: **Introduction to Environmental Studies**
- Multidisciplinary nature of environmental studies;
- Scope and importance; concept of sustainability and sustainable development.

Unit 2: **Ecosystem   (2 lectures)**
- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem:
- Food chains, food webs and ecological succession, Case studies of the following ecosystem:
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

Unit 3: Natural Resources: Renewable and Non – renewable Resources (6 lectures)
- Land resources and landuse change: Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over –exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 lecturers)
- Levels of biological diversity: genetics, species and ecosystem diversity, Biogeographic zones of India: Biodiversity patterns and global biodiversity hot spots
- India as a mega- biodiversity nation, Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions; Conservations of biodiversity: In-situ and Ex-situ Conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution   (8 lecturers)
- Environmental pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution.
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

Unit 6: Environmental Policies & Practices (8 lecturers)
- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection

Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

- Nature reserves, tribal populations and rights, and human Wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment   (7 lectures)
- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: floods, earthquake, cyclone and landslides.
- Environmental movements: Chipko, Silent Valley, Byssinosis of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g. CNG Vehicles in Delhi)

- **Unit 8: Field Work   (6 lectures)**
  - Visit to an area to document environmental assets: river / forest/ flora/ fauna etc.
  - Visit to a local polluted site – Urban / Rural/ Industrial/ Agricultural.
  - Study of common plants, insects, birds and basic principles of identification.
  - Study of simple ecosystem- pond, river, Delhi Ridge etc.

(Equal to 5 Lectures)

Suggested Readings:

1. Carson , R. 2002.Slient Spring, Houghton Mifflin Harcourt.
2. Gadgil , M.,& Guha, R. 1993.This Fissured Land: An Ecological History of India. Univ.of California Press.
3. Glesson, B. and Low, N.(eds.)1999. Global Ethics and Environment, London, Routledge.
4. Gleick,P.H.1993.Water Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env.Institute, Oxford Univ.Press.
5. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.

VALUE EDUCATION

Objective:

- Values are socially accepted norms to evaluate objects, persons, and situations that form part and parcel of sociality.
- A value system is a set of consistent values and measures. Knowledge of the values are inculcated through education.
- It contributes in forming true human being, who are able to face life and make it meaningful.
- There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values.
- Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration".
- "People should be treated with respect and dignity". Values tend to influence attitudes and behavior and help to solve common human problems. Values are related to the norms of a culture.

Unit I: Value education-its purpose and significance in the present world – Value system – The role of culture and civilization-Holistic living – Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities.

Unit II: Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self-esteem and self-confidence, punctuality – Time, task and resource management

– Problem solving and decision-making skills- Interpersonal and Intra personal relationship – Team work – Positive and creative thinking

Unit III: Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr. A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

Unit IV: Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

Unit V: Social Evils – Corruption, Cyber-crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women-How to tackle them

Books for Reference:

1. M.G.Chitakra: Education and Human Values, A.P.H.Publishing Corporation, New Delhi, 2003
2. Chakravarthy, S.K. : Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi , 1999.
3. Satchidananda, M.K.: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991
4. Das, M.S. & Gupta, V.K. : Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999
6. Ruhela, S.P. : Human Values and education, Sterling Publications, New Delhi, 1986
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975
8. NCERT, Education in Values, New Delhi, 1992
9. Swami Budhananda (1983) How to Build Character A Primer: Ramakrishna Mission, New Delhi
10. A Cultural Heritage of India (4 Vols.), Bharatiya Vidya Bhavan, Bombay. (Selected Chapters only)
11. For Life, For the future : Reserves and Remains – UNESCO Publication
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai
14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta
15. Awakening Indians to India, Chinmayananda Mission, 2003