

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-I/Core-1

Problem Solving Techniques and Programming in C

Unit I

Fundamentals of Computers:- Introduction – Characteristics of Computers – Generation of Computers – Types of Computers - The Computer System. **Input Devices:-** Types of Input devices - Keyboard – Mouse – Scanner. **Output Devices:-** Classification of output Devices – Dot matrix printer – inkjet printers – laser printers – LCD Monitors. **Computer Languages:-** Classification of Programming Languages – Generations of Programming Languages – Features of Good Programming Languages. **Fundamentals of Programming:-** Problem Solving Techniques - Steps for Problem Solving - Design of Algorithm - Flow Chart – Top-down Design or stepwise Refinement – Data Organization.

Unit II

C Declarations:- Introduction – Character Set – C tokens – Keywords and Identifiers – Identifiers – Constants – Variables – Data types – Declaration of Variables – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaring Variable as Constant. **Operators and Expressions:-** Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Expressions. **Managing Input and Output Operations:-** getchar() – putchar() – scanf() – printf().

Unit III

Decision Making and Branching:- Introduction – Decision Making with IF Statement – Simple IF statement – The IF...Else Statement – Nesting of IF...Else Statements – The ELSE IF ladder – The Switch Statement – The ?: Operator – The GOTO statement. **Decision Making and Looping:-** Introduction – The WHILE Statement – The DO Statement – The FOR statement **Arrays :-** Introduction – One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays - Two-dimensional arrays – Initialization of Two-dimensional arrays – Multi-dimensional arrays.

Unit IV

Character Arrays and Strings:- Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions. **User-Defined functions:-** Introduction – Need for User-defined functions – Definition of functions – Return Values and their Types – Function Calls – Function Declaration – Category of functions – No Arguments and No return values – Arguments but No return Values – Arguments with return values – No arguments but a return a value – Recursion – Passing Arrays to functions – Passing Strings to functions – The Scope, Visibility and lifetime of a variables. **Structures and Unions:-** Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Arrays of structures – Unions.

Unit V

Pointers:- Introduction – Understanding pointers – Accessing the Address of a Variable – Declaring Pointer Variables – Accessing a variable through its pointer – Pointer Expressions – Pointers as function arguments. **File Management in C:-** Introduction – Defining and Opening a file – Closing a File – Input/output Operations on files – Error Handling During I/O Operating .

Text Book:

Programming in ANSI C – 6th Edition by E Balagurusamy – Tata McGraw Hill Publishing Company Limited.

Reference Books:

1. Computer System and Programming in C by Manish Varhney, Naha Singh – CBS Publishers and Distributors Pvt Ltd.
2. Introduction to Computer Science, IITL Education Solutions Limited, Second Edition, Pearson Education
3. Computer Basics and C Programming by V. Rajaraman – PHI Learning Private Limited
4. Programming with C, Third Edition, Byron S Gottfried, Tata McGraw Hill Education Private Limited.

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-I/ Core Practical -1

Practical List – Programming in C

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. To find all possible roots of a quadratic equation using if and switch statement
2. Evaluate Sine series using while loop
$$\sin(x) = x - x^3/3! + x^5/5! - \dots x^n/n!$$
3. Sort a list of numbers in ascending order
4. Search an element in an array
5. Reverse a number and check whether the number is palindrome or not (eg. 1221).
6. Find the binomial coefficient (nC_r) value using recursion
7. Multiply two matrices (check for compatibility)
8. Transpose of a matrix
9. Alphabetical sorting (passing array as argument to function)
10. Exchange values using pointers and function
11. Prepare the student details using structure
12. Prepare mark sheet using file

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-I/ Allied -1

Discrete Mathematics

Unit I

Relations: Introduction to Relations – Binary relation – Classification of Relations – Composition of Relations – Inverse of Relation – Closure operation on Relations – Matrix representation of Relation - digraphs.

Unit II

Functions: Introduction to Functions – Addition and Multiplication of Functions - Classifications of Functions – Composition of Function – Inverse Function.

Unit III

Mathematical Logic: Introduction – Statement (Propositions) – Laws of Formal Logic –Basic Set of Logical operators/operations - Propositions and Truth Tables – Algebra Propositions - Tautologies and Contradictions – Logical Equivalence – Logical Implication – Normal Forms.

Unit IV

Matrix Algebra: Introduction – Definition of a Matrix - Types of Matrices – Operations on Matrices – Related Matrices – Transpose of a Matrix – Symmetric and Skew-symmetric Matrices – Complex Matrix – Conjugate of a Matrix – Determinant of a Matrix – Typical Square Matrices – Adjoint and Inverse of a Matrix – Singular and Non-singular Matrices – Adjoint of a Square Matrix – Properties of Adjoint of a Matrix – Properties of Inverse of a Matrix.

Unit V

Graph: Introduction – Graph and Basic Terminologies – Types of Graphs – Sub Graph and Isomorphic Graph – Operations on Graphs – Representation of Graph.

Trees: Introduction – Tree – Sequential Representation of a Binary Tree – Operations on Tree.

Text Book:

DISCRETE MATHEMATICS, Swapan Kumar Chakraborty and Bikash Kanti Sarkar,
OXFORD University Press.

Reference Books:

1. DISCRETE MATHEMATICS, Third Edition, Seymour Lipschutz and Marc Lars Lipson, Tata McGraw Hill Education Private Limited.
2. Discrete Mathematical Structures with Applications to Computer Science by J.P.Tremblay, R.Manohar TMH edition

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-I/Allied Practical-1

Practical List - Computer Basics

It is compulsory to complete all the exercises given in the list in the stipulated time.

(Any open source Office or MS Office)

1. Prepare a semester wise mark statement for a computer class of 20 students using any spreadsheet' worksheet. Total, average and rank the student marks. Give proper headings. Make the column headings bold and italic.
2. Consider the sample employee worksheet and calculate their salary.
3. Use any spreadsheet to use mathematical, statistical and logical functions
4. Use any spreadsheet to plot a chart for marks obtained by the students (out of 5) vs. frequency (total number of students in class is 50).
5. Create a database for a Telephone Directory. Create a table named phone book with relevant fields. Enter a minimum of 10 records.
6. Create a student database and create validation rules for fields like age, date of birth, pincode etc.
7. Enter data to the student database using a form.
8. Create a query and add criteria to the query.
9. Create a tabular auto report.
10. Customize a report in report design.

Reference Books:

1. Microsoft Office 2016 Step By Step, Lambert, Joan , Frye, Curtis D., Phi Learning
2. *Microsoft Access 2016* Step By Step, By Lambert, Joan Phi Learning
3. *Microsoft Excel 2016* Step By Step, Curtis Frye, Phi Learning
4. Browse the Internet for Open Source Office Software

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

SYLLABUS FOR ENVIRONMENTAL STUDIES FOR

UNDER GRADUATE COURSES -

PART IV- COMPULSORY PAPER

UNIT I: THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance

Natural resources and associated problems:

- a) Forest resources: Use and over-exploitation, deforestation, timber extraction, dams and their effects on forests and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, dams-benefits and problems, water conservation and watershed management.
- c) Mineral resources: Use and exploitation, environmental effects.
- d) Food resources: World food problems, changes, effects of modern agriculture, fertilizer-pesticide problems.
- e) Energy resources: Growing energy needs, renewables and non renewable energy sources, alternate energy sources.
- f) Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification.

UNIT II: ECOSYSTEMS

- a) Forest Ecosystem
- b) Grassland Ecosystem
- c) Desert ecosystem
- d) Aquatic Ecosystem (Ponds, rivers, oceans, estuaries)
Energy flow in the ecosystem
Ecological succession
Food Chains, Food Webs and Ecological Pyramids.

UNIT III: BIODIVERSITY AND ITS CONSERVATION

Introduction Definition: Genetic, species and ecosystem diversity.

Biogeographical classification of India

Values of Biodiversity

Biodiversity at global, national and local levels

India as a mega-diversity nation

Hot-Spots of biodiversity

Threats to biodiversity

Endangered and endemic species of India

Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

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UNIT IV: ENVIRONMENTAL POLLUTION

Definition- Causes, effects and control measures of:-

- a) Air Pollution
- b) Water Pollution
- c) Soil Pollution
- d) Marine Pollution
- e) Noise Pollution.
- f) Thermal Pollution

Solid Waste Management

Disaster Management: Floods, earthquake, cyclone and landslides.

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENT

Climatic change, global warming, acid rain, ozone depletion.

Wasteland reclamation

Consumerism and Waste products, use and through plastics

Environment Protection Act

Air (Prevention and Control of Pollution) Act

Water (Prevention and Control of Pollution) Act

Wildlife Protection Act

Forest Conservation Act

Population Explosion — Family Welfare Programme

Human Rights

REFERENCES:

1. G.S. Vijayalakshmi, A.G. Murugesan and N. Sukumaran. 2006. Basics of Environmental Science, Manonmaniam Sundaranar University Publications, Tirunelveli, pp.160.
2. Agarwal. K.C. 2001. Environmental Biology, Nidi Publications Limited, Bikaner.
3. A.K.De. 1999. Environmental Chemistry, Wiley Eastern Limited, India.
4. Jadhav, H. and Bhosale, V.M. 1995. Environmental Protection and Laws, Himalaya Publishing House, Delhi. pp284.
5. Odum, E.P. 1971. Fundamentals of Ecology, W.B.Saunders Co., USA. pp.574.

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. Computer Science

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)



Sem.	Pt. I/II/III/IV	Sub. No.	Subject status	Subject Title	Hrs./week	Cre. dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
II	I	8	Language	TAMIL/OTHER LANGUAGE	6	3	25	75	100	30	40
	II	9	Language	ENGLISH	6	3	25	75	100	30	40
	III	10	Core - 3	OBJECT ORIENTED PROGRAMMING IN C++	6	4	25	75	100	30	40
	III	11	Major Practical - II	OBJECT ORIENTED PROGRAMMING WITH C++ - PRACTICAL LIST	4	4	25	75	100	30	40
	III	12	Allied - II	DIGITAL DESIGN	4	4	25	75	100	30	40
	III	13	Allied Practical-II	PRACTICAL LIST – COMPUTER BASIS	2	4	25	75	100	30	40
	IV	14	Common	VALUE BASED EDUCATION/ சமூக ஒழுக்கங்களும் பண்பாட்டு வீழுமியங்களும்/ SOCIAL HARMONY	2	2	25	75	100	30	40
Subtotal					30	24					

Object Oriented Programming in C++

Unit I

Principles of Object Oriented Programming: Basic Concepts of Object Oriented Programming. **Classes and Objects:** Introduction – Specifying a Class – Defining Member Functions – Making an Outside Function Inline – Nesting of Member Functions - Private Member Functions – Static Data Members – Static Member Functions – Arrays of Objects – Objects as function arguments – Friendly Functions – Returning Objects .

Unit II

Constructors and Destructors: Introduction – Constructors – Parameterized Constructors – Multiple Constructors in a class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructors – Dynamic Constructors – const objects - Destructors.

Unit III

Operator Overloading and Type Conversions: Introduction – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators using Friends – Rules for Overloading Operators – Type Conversions. **Inheritance (Extending Classes):** Introduction – Defining Derived Class – Single Inheritance - Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes - Abstract Classes.

Unit IV

Pointers, Virtual Functions and Polymorphism: Introduction - Pointers - Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions - Pure Virtual Functions. **Managing Console I/O Operations:** Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O operations – Managing Output with Manipulators.

Unit V

Working with Files: Introduction – Classes for File Stream Operations – Opening and Closing a file – Detecting end-of-file – File Modes – Sequential Input and Output Operations. **Templates:** Introduction - Class Templates – Function Templates.

Text Book:

Object Oriented Programming with C++, Sixth Edition by E. Balagurusamy, Tata McGraw Hill Publishing Company Limited.

Reference Book:

1. Programming with ANSI C++, Bhushan Trivedi, 2010, Oxford University Press
2. The Complete Reference C++, Fourth/ Fifth Edition Herbert Schildt, Tata McGraw Hill Publishing Company Limited.
3. Programming With C++ Third Edition by D. Ravichandran, Tata McGraw Hill Education, 2011.
4. Programming in C++ Second Edition by Ashok N. Kamthane, Pearson Education

Object Oriented Programming with C++ - Practical List

It is compulsory to complete all the exercises given in the list in the stipulated time.

- 1) Program with a Class and Member Functions.
- 2) Program to Overload Function.(minimum three geometric figures)
- 3) Program to implement Parameterized Constructor.
- 4) Program to implement Friend Function (minimum two classes)
- 5) Program to Overload Unary Minus Operator.
- 6) Program to Overload Binary Plus Operator.
- 7) Program to implement Multiple Inheritance for Family Details.
- 8) Program to implement Multilevel Inheritance for Bank Customer Details.
- 9) Program to implement Hierarchical Inheritance for Students Details.
- 10) Program to implement Virtual Function.

Practical List - Computer Basics

It is compulsory to complete all the exercises given in the list in the stipulated time.

(LINUX)

1. Use any text editor in linux(say vi) to enter a sample C program, compile using gcc and display the output.
2. Linux commands
 - a. ls, mkdir, rmdir, cd, pwd, find, du(Directory oriented)
 - b. cat, cp, rm, mv, wc (File oriented)
 - c. ps, kill, batch, grep(Process oriented)
 - d. write, mail, wall (Communication oriented)
3. Linux commands
 - a. date, who, who am i, man, cal, echo, bc(General purpose)
 - b. Pipe, Filter
4. Write a shell script to display date in the mm/dd/yy format, time, username and current directory.
5. Write a shell script to find the sum of digits of a given number.
6. Write a shell script to generate mark sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
7. Use any text editor in linux(say vi) to enter a sample C program, compile using gcc and display the output.
8. Create mySQL database, table, insert values and display table values

Reference Books:

1. Linux: A practical approach, B. Mohamed Ibrahim, Firewall Media
2. Comdex Linux and Open Office course kit revised and upgraded, Gupta, Wiley India.
3. A practical guide to Linux command, editors, and shell programming 2/e; Mark G Sobell, Prentice Hall.
4. Linux Lab - Open source Technology : Ambavade - Dreamtech

Digital Design

Unit I

Number Systems and Codes: Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code. **Digital Logic:** The Basic gates NOT, OR, AND – Universal Logic Gates NOR, NAND – AND-OR Invert Gates – Positive and Negative Logic.

Unit II

Combinational Logic Circuits: Boolean Laws and Theorems – Sum of Products Method – Truth Table to Karnaugh Map – Pairs, Quads and Octets – Karnaugh Simplifications – Don't Care Conditions – Product of Sums Method – Product of Sums Simplification.

Unit III

Data Processing circuits: Multiplexers – De-multiplexers – 1-of-16- Decoders – BCD-to-Decimal Decoders – Seven-Segment decoders – Encoders – Exclusive-OR gates. **Arithmetic Circuits:** Binary Addition – Binary Subtraction – Unsigned Binary Numbers – Sign-Magnitude Numbers – 2's Complement Representation – 2's Complement Arithmetic.

Unit IV

Flip-Flops: RS Flip Flops – Edge Triggered RS Flip Flops - Edge Triggered D Flip Flops - Edge Triggered JK Flip Flops – JK Master Slave Flip Flops. **Registers:** Types of Registers – Serial in serial out – serial in parallel out – parallel in serial out – parallel in parallel out – Universal Shift Register.

Unit V

Counters: Asynchronous Counter – Ripple Counter and 3-bit Up/Down Counter only – Decoding Gates - Synchronous Counter – MOD 8 counter and 4-bit Up/Down counters only – Decade Counter - Preset-able counters.

Text Book:

Digital Principles and Applications, by Albert Paul Malvino & Donald P. Leach, Seventh Edition, Tata McGraw Hill Education Private Limited

Reference Book:

1. Fundamentals of Digital Circuits, A. Anand Kumar, Second Edition, PHI Learning Private Limited
2. Digital design, M. Morris Mano, Third Edition, Pearson Education

MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

Part IV

Value Based Education

Syllabus (For all UG Courses) w.e.f 2016-17

II Semester

Objective:

To enable the students to understand the social realities and to inculcate an essential value system towards building a health society.

Unit I: Social Justice

Definition – need – parameters of social justice – factors responsible for social injustice – caste and gender – contributions of social reformers.

Unit II : Human Rights and Marginalized People

Concept of Human Rights – Principles of human rights – human rights and Indian constitution – Rights of Women and children – violence against women – Rights of marginalized People – like women, children, dalits, minorities, physically challenged etc

Unit III: Social Issues and Communal Harmony

Social issues – causes and magnitude - alcoholism, drug addiction, poverty, unemployment etc – communal harmony –concept –religion and its place in public in public domain – separation of religion from politics –secularism role of civil society

Unit IV: Media Education and Globalized World Scenario

Mass media –functions –characteristics –need and purpose of media literacy – effects and influence - youth and children – media power – socio cultural and political consequences mass mediated culture -- consumeristic culture – Globalization – new media- prospects and challenges

Unit V: Values and Ethics

Personal values – family values – social values – cultural values – Professional values – and overall ethics – duties and responsibilities

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

**B.Sc. Computer Science
(Choice Based Credit System)**

**(with effect from the academic year 2016-2017 onwards)
(44th SCAA meeting held on 30.05.2016)**

Sem.	Pt. I/II / III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	III	15	Core – 3	WEB TECHNOLOGY	6	4	25	75	100	30	40
		16	Core – 4	JAVA PROGRAMMING	6	4	25	75	100	30	40
		17	Major Practical – III	JAVA PROGRAMMING	6	4	50	50	100	20	40
		18	Allied - III	COMPUTER ARCHITECTURE	4	4	25	75	100	30	40
		19	Allied Practical – III	SCRIPTING LANGUAGES	2	2	50	50	100	20	40
IV	20	Skilled Based Practical	PYTHON / SCILAB	4 (1T+ 3P)	(Continue to the next Semester)						
IV	21	Non-Major Elective - I	(A) INTRODUCTION TO COMPUTERS (OR) (B) PROGRAMMING IN C	2	2	25	75	100	30	40	
SUB- TOTAL					30	20					

Sem.	Pt. I/II/III/IV/V	Su b No.	Subject status	Subject Title	Hrs/ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	22	Core - 5	DATA STRUCTURES	6	4	25	75	100	30	40
		23	Major Practical - IV	DATA STRUCTURES LAB	6	5	50	50	100	20	40
		24	Major Elective-I (Select any one)	1. MULTIMEDIA APPLICATIONS / 2. EMBEDDED SYSTEM / 3. OPEN SOURCE TECHNOLOGIES	6	4	25	75	100	30	40
		25	Allied - IV	E-COMMERCE	4	4	25	75	100	30	40
		26	Practical - IV	SCRIPTING LANGUAGES	2	4	50	50	100	20	40
		IV	27	Skilled Based subject - II	PHP / XML	4 (1T+ 3P)	2	25	75	100	30
IV	28	Non Major Elective – II	(A) BASIC PROGRAMMING DESIGN (B)FUNDAMENTALS OF INTERNET	2	2	25	75	100	30	40	
V		Extension Activity	NCC,NSS, YRC, YWF		1						
		SUB- TOTAL			30	26					

Web Technology

Unit I

Introduction: What is the Internet-History of Internet-Internet Services and Accessibility-Uses of the Internet-Protocols-Web concepts-The client/server model at the web-Retrieving data from the web. **Internet Protocols:** Introduction – Internet protocols-transmission control protocols-User Datagram protocols - Host Names - Internet applications and application protocols.

Unit II

HTML: Introduction-SGML-DTD-DTD Elements- attributes-outline of an HTML document-Head section-Body section- HTML Tags - HTML forms. **Dynamic HTML:** Introduction- cascading style sheets-DHTML Document object model and collections-Event handling - filters and transitions.

Unit III

JavaScript: Introduction-language elements-objects of JavaScript-other objects- Arrays. **VBScript:** Introduction-embedding VBScript code in an HTML document- comments-variables-operators-procedures-conditional statements-looping constructs- objects & VBScripts-Cookies.

Unit IV

Extensible Mark-Up Language (XML): Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – Building blocks of XML Documents – XSL - XSL Transformation – XML Schema. **Common Gateway Interface (CGI):**Server- Browser interaction –CGI Script Structure – CGI Environment variables - Processing forms- CGI security issues.

Unit V

Servlets: Advantages of Servlets over CGI – Installing Servlets – The Servlet Life Cycle – Servlet API – A simple Servlet – Handling HTTP GET requests - Handling HTTP POST requests – Cookies – Session Tracking – Multi-tier Applications using Database Connectivity – Servlet Chaining. **Java Server Pages (JSP):** Advantages of JSP – Components of JSP – Reading Request Information – Retrieving the Data Posted from a HTML file to a JSP file – JSP Sessions – Cookies – Disabling Sessions. **Active Server Pages (ASP):** Advantages of using ASP – Processing of ASP Scripts with Forms – Variables and Constructs – Subroutines – Include/Virtual – ASP Cookies – ASP Objects – Connecting to data with ASP..

Text Book:

Web Technology A Developer's Perspective, N.P.Gopalan, J. Akilandeswari ,PHI

Reference Book:

1. Web Technology and Design, C.Xavier, New Age International Publishers
2. Web Technologies TCP/IP Architecture and Java Programming Second Edition, Achyut S. Godbole & Atul Kahate, Tata McGraw Hill
3. Web Technology, S. Padma Priya, SCITECH Publications (India)Pvt. Ltd

JAVA PROGRAMMING

UNIT I

Data Types, Variables and Arrays: Primary types – Integers – Floating point types – Characters – Booleans – A Closer Look at Literals – Variables – Type Conversion and Casting – Automatic type Promotion in Expressions - One Dimensional Arrays– Multi Dimensional Arrays. **Operators:** Arithmetic Operators – Bitwise operators – Relational Operators – Boolean Logical Operators – Assignment Operator – Conditional Operator – Operator Precedence-Using parentheses.

UNIT II

Introducing Classes: Class Fundamentals – Declaring objects- Assigning object Reference variables- Introducing Methods- Constructors-Garbage collection – Finalize() Method **A Closer Look at Methods and classes:** Overloading Methods-Using objects as parameters- Argument passing –Returning objects- Recursion-Introducing Access control – understanding static –Introducing final – Nested and Inner classes- String class- Using command line arguments. **Inheritance:** Inheritance Basics –Using super- creating Multilevel Hierarchy - Method overriding –Dynamic Method Dispatch –Using Abstract class –Using final with inheritance-The object class.

UNIT III

Packages and interfaces: Packages –Access Protection – Importing packages-Interfaces. **Exception Handling:** Introduction- Exception Types – Uncaught Exceptions- Using try and catch – Multiple catch clauses –Nested try statements- throw – throws-finally. **Multithreaded programming :** Java Thread Model –Main Thread –Creating a Thread –Creating Multiple Threads – Using is Alive() and join() –Thread priorities

UNIT IV

The Applet class: Applet Basics – Applet Architecture –Applet Skeleton- Applet Display method –Requesting Repainting – HTML APPLET tag- Passing Parameters to Applet. **Event Handling:** Event Handling Mechanisms –Delegation Event Model –Event classes(The Action Event ,Item Event , Key Event, Mouse Event) – Sources of Events - Event Listener Interfaces(Action Listener, Item Listener, Key Listener, Mouse Listener).

UNIT V

Introducing the AWT: AWT Classes – Window fundamentals – working with Frame Windows –working with Graphics– Working with color – Working with Fonts. **Using AWT Controls:** Controls Fundamentals – Labels – Using Buttons –Applying check Boxes – Check Box group – Choice Controls – Using a Text field – Using a Text Area – Understanding Layout Managers [Flow Layout Only] – Menu Bars and Menus.

Text Book:

Java, The Complete Reference 8/e , Herbert Schildt, TMH

Reference Book:

1. Programming with Java –C.Muthu
2. Java Programming A Practical Approach, C.Xavier, TMH
3. Programming in Java, Sachin Malhotra, Saurabh Choudhary, OXFORD University Press
4. Programming with Java a primer 3/E E.BALAGURUSWAMY
5. Core Java, Mahesh P. Matha, PHI Learning Private Limited

JAVA PRACTICAL LIST

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Define a class called Student with the attributes name, reg_number and marks obtained in four subjects(m1,m2,m3,m4). Write a suitable constructor and methods to find the total mark obtained by the student and display the details of the student.
2. Write a Java program to find the area of a square, rectangle and triangle by
 - (i) Overloading Constructor
 - (ii) Overloading Method.
3. Write a java program to add two complex numbers.
[Use passing object as argument and return object].
4. Define a class called Student_super with data members name, roll number and age. Write a suitable constructor and a method output () to display the details. Derive another class Student from Student_super with data members height and weight. Write a constructor and a method output () to display the details which overrides the super class method output().[Apply method Overriding concept].
5. Write a java program to create a package —Employee which contains the classes Emp and Memp. The data members of Emp are name, emp_id, category and Bpay. write suitable constructors and methods to compute net pay of the employee. The class Memp contains the main method.
6. Write a java program to create an interface called Demo, which contains a double type constant, and a method called area () with one double type argument. Implement the interface to find the area of a circle.
7. Write a java program to create a thread using Thread class.
8. Write a java program to Design a calculator to perform only addition and division. It must contains three Buttons with labels +, / and =, and a TextField to get input and display the result.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science) / Semester-III / Ppr.no.17/
Major Practical - III**

9. Create an applet with four Checkboxes with labels MARUTI-800, ZEN, ALTO and ESTEEM and a Text area object. The program must display the details of the car while clicking a particular Checkbox.
10. Write a Java program, which creates a window with a check box group with boxes for the colors, Violet, Indigo, Yellow, Orange, Red, Blue, and Green. When the button is selected the background color must change accordingly.
11. Write a Java program to throw the following exception,
 - 1) Negative Array Size
 - 2) Array Index out of Bounds
12. Write a java program to create a file menu with options New, Save and Close, Edit menu with option cut, copy and paste.

COMPUTER ARCHITECTURE

UNIT I

Basic Computer Organisation And Design : Instruction codes - Computer Registers - Computer Instructions - Timing and Control - Instruction Cycle - Control Memory-Address Sequencing

UNIT II

Central Processing Unit : General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data transfer and manipulation – Program Control.

UNIT III

Computer Arithmetic : Hardware Implementation and Algorithm for Addition, Subtraction, Multiplication, Division-Booth Multiplication Algorithm-Floating Point Arithmetic

UNIT IV

Input Output Organization: Input – Output Interface – Asynchronous data transfer – Modes of transfer – Priority Interrupt – Direct Memory Access (DMA). **Memory Organisation:** Memory Hierarchy - Main memory - Auxillary memory - Associative memory - Cache memory - Virtual memory.

Unit V

Advanced Processing: RISC, CISC Characteristics- Parallel Processing-Pipe Lining- Vector Processing-Array Processor-Multi Processors-Interconnections Structures

Text Book:

Computer system Architecture - by Morris Mano, Third Edition. P.H.I Private Limited.

Reference Books:

1. Computer System Architecture P.V.S. Rao PHI
2. Nirmala Sharma, "Computer Architecture", First Edition,2009,University Science Press
3. Nicholos Carter, "Computer Architecture" ,2006, TMH Publication.

**Practical List - Scripting Languages
(Java Script/ VB Script/HTML)**

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a home page using HTML with neat formatting, different fonts and colors.
2. Create a website using internal links and images.
3. Design a calendar using table tag.
4. Create a HTML document to display a list of five flowers and link each one to another document displaying brief description of the flower, Add pictures wherever possible.
5. Write an HTML code to display a list of 5 cars in a frame, Link each one to a brief description in second frame. The left frame should display the list and the right frame should display the paragraph about the frame.
6. Using CSS, design a website.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/Semester-III/
Ppr.no.20(A)/Skill Based – I (A)**

Practical List – PYTHON

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3. WAP to display the first n terms of Fibonacci series.
4. WAP to find factorial of the given number.
5. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
6. WAP to calculate the sum and product of two compatible matrices.
7. WAP to read n integers and display them as a histogram.
8. WAP to display sine, cosine, polynomial and exponential curves.
9. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
10. Explore String functions.
11. Creating a CSV File based on user input.
12. Reading a CSV File already created and display the contents

Reference Book:

1. Python in easy steps - Mike McGrath - Mc Graw Hill publications
2. Introduction to computation and programming using Python - John V. Guttag - PHI
3. Chun, J Wesley, Core Python Programming, 2 nd Edition, Pearson, 2007 Reprint 2010.

Practical List – SCILAB

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Demonstrate scilab as a calculator(at least 15 calculations)
2. Demonstrate elementary mathematical functions(at least 15 functions)
3. Demonstrate statistics methods(at least 10 functions)
4. Demonstrate matrix operations(at least 5 operations)
5. Demonstrate using functions - arrange an array in ascending order
6. Demonstrate using functions - convert decimal to binary(without using built-in function)
7. Demonstrate plotting few curves defined by $f(x)$ (at least 3 functions)
8. Demonstrate plotting a histogram with proper labels (at least 3 histograms)
9. Demonstrate plotting bar graph with proper labels (at least 3 graphs)
10. Read from a file and plot any graph

References:

1. Scilab - A Hands on Introduction - Satish Annigeri - ebook(pdf)
2. <https://www.scilab.org/>
3. http://www.openeering.com/sites/default/files/First_Steps_0.pdf
4. http://www.openeering.com/sites/default/files/Scilab_calculator.pdf
5. https://www.scilab.org/content/download/849/7901/file/Scilab_beginners.pdf
6. <https://www.scilab.org/content/download/247/1702/file/introscilab.pdf>
7. <http://www.ee.iitm.ac.in/~hsr/scilab/manual.pdf>

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/Semester-III/
Ppr.no.21 (A) / Non-Major Elective – I (A)**

Introduction to Computers

UNIT I

Computer Preliminaries: Introduction – Characteristics of a Computer – Generations of Computer – Applications of Computer – Architecture of a Computer – Computer memory – Classification of Computers - Concepts of Hardware and Software.

UNIT II

Peripheral Devices: Input Devices – Keyboard, Pointing Devices, Scanning Devices, Audio and Video input devices. Output Devices – Dot matrix printer, Ink-jet Printer, Laser Printer, Drum Plotter, Flatbed Plotter, Monitors, Projectors, Speaker, Headphone. Storage devices –Hard disk, Optical Storage devices, Solid State devices.

UNIT III

Operating Systems: Introduction – types of User Interface – Functions of Operating System – Getting started with Windows – Windows Explorer – Windows setting – Creating Shortcuts – Windows Accessories.

UNIT IV

Elements of Word Processing : Introduction to Microsoft Office – MS Word – Creating, Opening and Saving a Document – Menu Bar – Formatting the text –View Menu – Insert menu – Tools Menu – Table Manipulation – Window menu – Printing a document.

UNIT V

Computer Networks : Introduction to Computer communication – Client server architecture – Networking components - Uses of Network – Common types of network – Network topology.

Text Book:

Computer Basics to Advancements - by P. Velmani and V. Lakshmi Praba, Chess Educational Publishers, Chennai.

Reference Book:

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education.
2. Introduction to Computers, Peter Norton Tata McGraw Hill.
3. Fundamentals of Information Technology By Alexis Leon & Mathews Leon Vikas publication – New Delhi

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/Semester-III/
Ppr.no.21 (B)/Non-Major Elective – I (B)**

Programming in C

Unit I

C Declarations:- Introduction – Character Set – C tokens – Keywords and Identifiers – Identifiers – Constants – Variables – Data types – Declaration of Variables – initializing variables – dynamic initialization – type modifiers – type conversion – constant and volatile variables. **Operators and Expressions:-** Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Operator Precedence.

Unit II

Input and Output in C: Introduction – Formatted Functions – Flags, widths and Precision with Format String – Unformatted Functions – Commonly used Library functions. **Decision Statements :** Introduction – Simple IF statement – The IF...Else Statement – Nesting of IF...Else Statements – The ELSE IF ladder – The Break Statement – The Continue Statement – The Goto Statement – The Switch Statement.

Unit III

Loop Control:- Introduction –The WHILE Statement – The DO Statement – The FOR statement – Nested FOR Loops. **Arrays :-** Introduction – One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays – Array terminology -Two-dimensional arrays – Initialization of Two-dimensional arrays.

Unit IV

Strings and Standard functions:- Introduction – Declaring and Initializing String Variables – Display of strings in different formats – String Standard functions – String Conversion Functions. **Unit V**

Functions:- Introduction – Basics of a function - Function definition – The Return statement Types of functions – Call by Value and Reference – Function as an argument – Function with operators – function and decision statements – function and loop statements – functions with arrays.

Text Book:

Programming in C – 3th Edition by Ashok Kamthane – Pearson Education

Reference Book:

1. Computer Basics and C Programming by V. Rajaraman – PHI Learning Private Limited
2. Programming with C, Third Edition, Byron S Gottfried, Tata McGraw Hill Education Private Limited.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.22/Core - 5**

DATA STRUCTURES

Unit I

Basic Concepts:- Algorithm specification – Data Abstraction – Performance Analysis.
Arrays and Structures:- Arrays: Abstract data type – Polynomials – Sparse Matrices – Representation of Multidimensional Arrays.

Unit II

Stacks and Queues:- Stacks – Queues – Evaluation of Expressions – Multiple Stacks and Queues. **Linked Lists:-** Singly Linked Lists and Chains – Linked Stacks and Queues – Polynomials: Polynomial Representation – Adding Polynomials. – Additional List Operations: Operations for Circularly Linked Lists. – Sparse Matrices: Sparse Matrix Representation. – Doubly Linked Lists.

Unit III

Trees:- Introduction – Binary Trees – Binary Tree Traversals: Inorder Traversal – Preorder Traversal – Postorder Traversal – Iterative Inorder Traversal. - Threaded Binary Trees – Heaps – Binary Search Trees – Selection Trees – Forests: Transforming a Forest into a Binary Tree. – Representation of Disjoint sets: Introduction – Union and Find operations. – Counting Binary Trees : Distinct Binary Trees.

Unit IV

Graphs: - The Graph Abstract Data Type-Elementary Graph Operations – Minimum Cost Spanning Trees: Kruskal’s Algorithm – Prim’s Algorithm. – Shortest Paths and Transitive Closure: Single Source/ All Destination: Nonnegative Edge Costs – Single Source / All Destination: General Weights – All Pairs Shortest Paths. – Activity Network: Activity-on-Vertex(AOV) Networks.

Unit V

Sorting:- Motivation – Insertion Sort – Quick Sort – Merge Sort: Recursive Merge Sort. – Heap Sort – External Sorting: Introduction – k-way Merging.**Hashing:-** Static Hashing: Hash Tables.

Text Book:

Fundamentals of Data Structures in C by Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed – Second Edition – Universities Press (India) Private Limited.

Reference Books:

1. Data Structures Using C, Second Edition by Reema Thareja – Oxford University Press
2. Data Structures by Dr N Jeya Prakash – Anuradha Publications

Data Structures Lab

It is compulsory to complete all the exercises given in the list in the stipulated time.

(C / C++ / Java)

1. Merging two unsorted Arrays.
2. Inserting a node after a given node and Deleting a given node in a Singly Linked List.
3. Evaluating Arithmetic expression using Postfix notation.
4. Implementation of Circular Queues- Add and delete.
5. Implementation of Binary Tree Traversals using recursion.
 - a) Pre-order
 - b) In-order
 - c) Post-Order
6. Implementation of Breadth First Search algorithm.
7. Implementation of Depth First Search algorithm.
8. Search an element in a list using Binary Search
9. Implementation of Merge Sort
10. Implementation of Quick Sort

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.24(A)/Major Elective – I (A)**

Multimedia Applications

Unit I

Introduction: Objectives – History of Multimedia – Its market – Content copyright – Resources for multimedia developers – Types of produces – Evaluation – Hardware Architecture – OS and Software – Multimedia Architecture – Software library – Drivers.

Unit II

Text and Graphics : Elements of Text – Text Data files – Using text in Multimedia Application – Hypertext – Elements of Graphics – Images and color – Graphics files and Application formats – Creating images for multimedia use –Using graphics in Application.

Unit III

Digital Audio and Video : Characteristics of sound and Digital audio – Digital Audio systems – MIDI – Audio file formats – Using Audio in Multimedia Applications – Audio for content – Background as video – Characteristics of digital video – digital video data sizing 0 Video capture and playback systems –computer animation.

Unit IV

Product design and Authoring tools: Building blocks – classes of products – Content organizational strategies – story boarding – Multimedia tool selection – Tool feature – categories of Authoring tools – selecting the right authoring paradigm.

Unit V

Multimedia and Internet : Internet – HTML and web authoring – Multimedia considerations for Internet – Design considerations for web pages.

Text Book :

Multimedia Technology and Applications – David Hillman-Galgotia Publications pvt. Ltd, 1998.

Reference Books :

1. Multimedia making it work by Tay Vaughan TMH, 1997
2. Computer Graphics Multimedia and Animation - Malay K. Pakhira PHI , New Delhi - Second edition
3. Principles of Multimedia - Ranjan Parekh - TMGH, New Delhi - Twelfth Reprint,
4. Computer Graphics and Multimedia - Anirban Mukhapathyay, Aruop Chattopadhyay - Vikas Publishing Ltd - Second Edition

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/

Semester-IV/Ppr.no.24 (B)/Major Elective – I (B)

Embedded System

Unit I

Introduction to embedded System – Examples of Embedded Systems – Typical Hardware – Gates – Times Diagram – Memory.

Unit II

Advanced Hardware Fundamentals: Microprocessors Buses – DMA – Interrupts – Built in on the microprocessor – Conventions used on Schematic – Schematic Interrupts Microprocessor Architecture – Interrupt Basics – Shared Data Problem – Interrupt Latency.

Unit III

8051 Micro Controllers: Micro Controllers and Embedded Processors – Overview of 8051 Family – Block Diagram – PIN Description.

Unit IV:

Software Development: Round-Robin, Round Robin with interrupts, Function-Queue-Scheduling Architecture, Algorithms, Introduction to Assembler, Compiler, Cross Compilers and IDE, Recursion, Debugging Strategies, Simulators.

Unit V:

RTOS: Task and Task States, Task and Data, Semaphores and Shared Data. OS Services – Message Queues – Timer Function – Events – Memory Management – Interrupt Routines in RTOS Environment – Basic Design using RTOS.

Text Book:

David E.Simson, An Embedded Software Primer, Pearson Education Asia, 2001.

Reference Books:

1. The 8051 Microcontrollers and Embedded Systems using Assembly and C, Muhammed Ali Mazidi, Rolin D.MCKinlay, Pearson Education.
2. Raj Kamal, Embedded Systems Architecture, Programming and Design, TMH, 2003.

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/

Semester-IV/Ppr.no.24(C)/Major Elective – I (C)

Open Source Technologies

Unit I

Introduction : Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. History : BSD, The Free Software Foundation and the GNU Project.

Unit II

Open Source History, Initiatives, Principle and methodologies. Philosophy : Software Freedom, Open Source Development Model Licences and Patents: What Is A License, Important FOSS Licenses (Apache,BSD,GPL, LGPL), copyrights and copylefts, Patents Economics of FOSS : Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization

Unit III

Community Building: Importance of Communities in Open Source Movement-JBoss Community- Starting and Maintaining an Open Source Project - Open Source Hardware

Unit IV

Apache HTTP Server and its flavors- WAMP server (Windows, Apache, MySQL, PHP)- Apache, MySQL, PHP, JAVA as development platform.

Unit V

Open source vs. closed source Open source government, Open source ethics. Social and Financial impacts of open source technology, Shared software, Shared source.

REFERENCE

1. PDF file available in web sites
2. https://en.wikibooks.org/wiki/Open_Source

E-Commerce

Unit I

History of E-Commerce : Electronic Commerce - Early Business Information Interchange Efforts – Emergence of the Internet – Emergence of the World Wide Web – The Milestones - Advantages of E-commerce – Disadvantages of E-Commerce - Online Extension of a BAM Model – Transition to E-Commerce in India - The Internet and India. **Business Models for E-Commerce** : Social Networking and Facebook – Business Model – E-business Models Based on the Relationship of Transaction Parties – E-business Models Based on the Relationship of Transaction Types.

Unit II

Enabling Technologies of the World Wide Web : World Wide Web – Internet Client-Server Applications - Networks and Internets - Software Agents – Internet Standards and Specifications – Internet Service Providers(ISP) – Hypertext - JavaScripts - XML.

Unit III

e-Marketing - Google – Traditional Marketing – Identifying Web Presence Goals - The Browsing Behaviour Model – Online Marketing – E-advertising – Internet Marketing Trends – Target Markets – E-branding – Marketing strategies.

Unit IV

e-Security : Information System Security – Security on the Internet – E-business Risk Management Issues – Information Security Environments in India.

Unit V

e-Payment Systems : E-banking at ICICI Bank – Main Concerns in Internet Banking - Digital Payment Requirements – Digital Token-based e-Payment Systems – Classification of New Payment Systems - Properties of Electronic Cash(e-cash) – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-Payment Systems – Digital Signature – Online Financial Services in India.

TEXT BOOK:

1. P.T.Joseph , S . J, E-Commerce – An Indian Perspective, PHI Learning Pvt Ltd.,2013

Reference Books:

- 1 CSV Murthy, E-Commerce – Concepts Models Strategies, Himalaya Publishing House
2. Bharat Bhasker, Electronic Commerce Framework, Technologies and application, Tata Mcgraw Hill.

Scripting Languages

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a simple HTML Form covering major form elements.
2. Create a Navigation bar (with dropdown) with CSS.
3. Embed Audio and Video in an HTML page.
4. Rotate an element using CSS.
5. Build a simple quiz.

Practical List – PHP

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
2. Write a PHP script to redirect a user to a different page.
3. Write a PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator.
4. Create a PHP script which display the capital and country name from the given array. Sort the list by the name of the country
5. Write a PHP script to calculate and display average temperature, five lowest and highest temperatures.
6. Create a script using a for loop to add all the integers between 0 and 30 and display the total.
7. Write a PHP script using nested for loop that creates a chess board.
8. Write a PHP function that checks if a string is all lower case.
9. Write a PHP script to calculate the difference between two dates.
10. Write a PHP script to display time in a specified time zone.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc.Computer Science)/
Semester-IV/Ppr.no.27(B)/Skill Based – II (B)**

Practical List – XML

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create your own XML markup, a markup describing a simple letter.
2. Create a CSS file intended to render the file created in a previous exercise
3. Use XSLT to transform the file created in a exercise1 to plain text file
4. Transform an XML document into XHTML
5. Design a simple homepage with XHTML and CSS files.
6. Create a sample XML document containing information about a few hospitals, patients, and doctors.

References

1. Getting Started with XML: A Manual and Workshop by Eric Lease Morgan.
2. Understanding XML A Software Development Approach by Hossein Hassani

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/
Semester-IV/Ppr.no.28 (A)/Non- Major Elective – II (A)**

Basic Program Design

Unit I

Computer Program: Introduction – Developing a program – Algorithm – Flowchart – Decision Tables.

Unit II

Program Testing and Debugging – Program Documentation – Program Paradigms: Unstructured programming, Structured programming and Object Oriented Programming – Characteristics of a Good Programming.

Unit III

Computer Languages: Evolution Programming Languages – Classification of Programming Languages – Generation of Programming Languages – Features of Good Programming language.

Unit IV

Computer Software: Software Definition – Relationship between Software and Hardware - Software Categories : System Software and Application Software – Terminology Software Firmware, Liveware, Freeware, Public Domain Software, Shareware, Commercial Software and Proprietary Software.

Unit V

Evolution of Internet - Internet Basics: Basic Internet Terms – Getting connected to Internet - Internet Applications – E-mail – Searching the Web – Internet and Viruses.

Text Book:

Introduction to Computer Science, IITL Education Solutions Limited, 2/e, Pearson

Reference Books:

1. Fundamentals of Computers, V.Rajaram, 5th Edition, PHI
2. Introduction to Computers, Peter Norton, 7/e, TMH.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Computer Science)/
Semester-IV/Ppr.no.28 (B)/Non-Major Elective – II (B)**

Fundamentals of Internet

Unit I

The Internet: Introduction – From Computers to the Internet - Advantages of the Internet – Major Internet Services – Hardware and Software in the Internet Age. **Evolution and Growth of the Internet:** Birth of the Internet – Current Networking Technologies – Next Generation Networking. **Working of the Internet:** The Internet Architecture – Client Server Computing – TCP/IP - The Protocols of the Internet.

Unit II

Getting Online: Types of Internet Accounts – Selecting Internet Service Providers – **Electronic Mail:** Advantages of E-mails – E-mail addresses – Mail transfer protocols – Working of E-mail system. **World Wide Web:** Architecture of the World Wide Web – Types of websites – Uniform Resource Locator – Domain Name System – Web Pages and Web Links – Visiting Web Pages – Using Internet Explorer – Searching the Web – Google and Yahoo Search Engines.

Unit III

Hosting and Promoting Websites: Structure of Websites – Web Development tools – Microsoft Front Page – Adobe Dreamweaver – Visual Studio. NET – Hosting Websites – Getting a Domain /name – Visitor Analysis and Statistics – Website Promoting methods.

Unit IV

Electronic Commerce: E-Business and E-Commerce – Types of business in the internet – M-Commerce - Marketing Strategies on the Web – Making Payments in Virtual Stores – Shopping in Virtual Stores – Cookies and E-Commerce – Major issues of E-commerce and M-Commerce – Future of E-commerce.

Unit V

Blogs and Social Networking: Blogs – Uses of Blogs – Blogs System Components – Steps for Blogging – Building a Blog site – Social Networking – Etiquette in networking sites. **Internet Security:** Importance of Internet Security – Internet Threats – Identity theft and Cybersquatting – Hacking – Spamming and Spoofing – Phishing and Pharming – Denial of Service – spyware – Viruses and worms- Security solutions – Firewalls and Intrusion Prevention Systems – Internet Security Precautions- The Information Technology Act.

Text Book:

The Internet A User's Guide Second Edition by K.L. James – PHI Learning Private Limited

Reference Books:

1. Internet, World Wide Web, How to program, 4th Edition, Paul Deital, Harvey M Deitel, Pearson
2. Learning Internet & Email, 4th Revised Rdition, Ramesh Bangia, Khanna Book Publishing Co Pvt Ltd.
3. Internet & Ecommerce, C. Nellai Kannan, NELS Publications.

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGE

B.Sc., Computer Science

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

V	I	29	Core - 6	Software Engineering and Testing	4	4	25	75	100	30	40
	II	30	Core - 7	Data Communication and Computer Network	4	4	25	75	100	30	40
	III	31	Core - 8	Dot NET Technologies	4	4	25	75	100	30	40
		32	Major Practical -V	Dot NET	8	4	50	50	100	20	40
		33	Major Elective – II (Select any one)	A) Mobile Computing B)Cryptography and Network Security C) Cloud Computing	6	5	25	75	100	30	40
	IV	34	Skill Based subject (Common)	Personality Development/ Effective Communication/ Youth Leadership	4	4	25	75	100	30	40
				Subtotal	30	25					
VI	III	35	Core - 9	Operating System	4	4	25	75	100	30	40
	III	36	Core - 10	Relational Database Management System	4	4	25	75	100	30	40
	III	37	Core - 11	Computer Graphics and Visualization	4	4	25	75	100	30	40
	III	38	Core - 12	Data Mining	4	4	25	75	100	30	40
		39	Major Practical -VI	RDBMS with Oracle Lab	8	4	50	50	100	20	40
		40	Major Elective - III (Select any one)	Big Data Analytics / Artificial Neural Network/Internet of Things	6	5	25	75	100	30	40
				Subtotal	30	25					

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-V/ Ppr.no.29 / Core - 6

Software Engineering and Testing

Unit I

Introduction:- Evolution – From an Art form on Engineering Discipline: Evolution of an Art into an Engineering Discipline. – Software Development of Projects: Program versus Product – Emergence of Software Engineering: Early Computer Programming – High Level Language Programming – Control Flow-based Design – Data Structure Oriented Design – Object Oriented Design. **Software Life Cycle Models:-** A few Basic Concepts – Waterfall Model and its Extension: Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model. – Rapid Application Development (RAD): Working of RAD. –Spiral Model.

Unit II

Software Project Management:- Responsibilities of a Software Project Manager – Project Planning- Project Estimation Techniques-Risk Management. **Requirements Analysis and Specification:-** Requirements Gathering and Analysis – Software Requirements Specifications (SRS):Users of SRS Document – Characteristics of a Good SRS Document – Important Categories of Customer Requirements – Functional Requirements – How to Identify the Functional Requirements? – Organisation of the SRS Document.

Unit III

Software Design:- Overview of the Design Process: Outcome of the Design Process – Classification of Design Activities. – How to Characterize a good Software Design? **Function-Oriented Software Design:-** Overview of SA/SD Methodology – Structured Analysis – Developing the DFD Model of a System: Context Diagram – Structured Design – Detailed Design. **Object Modelling Using UML:-** Basic Object Oriented Concepts: Basic Concepts – Class Relationships – Other Key Concepts – Related Technical Terms – Advantages and disadvantages of OOD. – Unified Modelling Languages (UML) – UML Diagrams – Class Diagrams – Interaction Diagrams – Activity Diagram – State Chart Diagram.

Unit IV

User Interface Design:- Characteristics of a good User Interface - Basic Concepts – Types of User Interfaces – Fundamentals of Components based GUI Development: Window System. **Coding and Testing:-** Coding – Software Documentation – Testing: Basic Concepts and Terminologies – Testing Activities. – Unit Testing – Black-box Testing: Equivalence Class Partitioning – Boundary Value Analysis. – White-box Testing – Debugging: Debugging Approaches. – Integration Testing – System Testing: Smoke Testing – Performance Testing.

Unit V

Software Reliability and Quality Management:- Software Reliability: Hardware versus Software Reliability. – Software Quality – Software Quality Management System – ISO 9000: What is ISO 9000 Certification? – ISO 9000 for Software Industry – Shortcomings of ISO 9000 Certification. – SEI Capability Maturity Model: Level 1 to Level 5. **Computer Aided Software Engineering:-** Case Environment – CASE Support in Software Life Cycle. **Software Maintenance:-** Characteristics of Software Maintenance: Characteristics of Software Evolution – Software Reverse Engineering.

Text Book:

Fundamentals of Software Engineering Fourth Edition by Rajib Mall – PHI Learning Private Limited 2015

Reference Books:

1. Software Engineering 2nd Edition by K L James PHI
2. Software Engineering 9th Edition by Ian Sommerville - Pearson Education Asia

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-V/ Ppr.no.30/Core - 7

Data communication and Computer Network

Unit I

Introduction - Data communication – Networks-the Internet –Protocols and Standards –
Network Models –Layered tasks –OSI model- layers in OSI model-TCP/IP protocol Suit-Addressing.

Unit II

Physical layer – Analog and digital – Transmission Impairment –Data rate limits-Performance-
Transmission mode -**BandWidth Utilization**- Multiplexing Spread Spectrum- **Transmission media** –
Guided and Unguided media.

Unit III

Switching – Circuit Switched Network-Datagram Network – Virtual Circuit Network-Structure of
a Switch. **Using telephone and cable networks** – Telephone Network- Dial-Up Modem–Digital
Subscriber line – Cable TV Network and Cable TV for Data transfer. **Data Link Layer** : Error Detection and
Correction- Introduction- Checksum.

Unit IV

Data link control-Framing-Flow and Error Control-Protocols-Noiseless Channels-Noisy Channels.
Wired LANs-IEEE standards-Standard Ethernet- Changes in the Standard – Fast Ethernet-Gigabit
Ethernet. **Wireless LANs**: IEEE 802.11-Blue tooth. **Connecting LANs** : Connecting devices, Backbone
networks. **Wireless WANs**: Cellular Telephony, Satellite Networks.

Unit V

Network Layer- IPv4 Address-IPv6 Address-Internetworking. **Transport Layer**-Process to Process
delivery –UDP-TCP. **Application Layer**- Name space-DNS- DNS in the internet. **WWW and HTTP**-
Architecture-web documents-HTTP.

Text Book

Data Communication and Networking –“BEHROUZ A FOROUZAN “ , The McGraw- Hill- 4 th ed.

UNIT I : 1.1-1.4,2.1-2.5,

UNIT II: 3.1,3.4-3.6,4.3,6.1,6.2,7.1,7.2

UNIT III : 8.1-8.4,9.1-9.5,10.1,10.5

UNIT IV: 11.1-11.5,13.1-13.3,13.4,13.5,14.1,14.2,15.1,15.2,16.1,16.2

UNIT V: 19.1,19.2,20.1,23.1,23.2,23.3,25.1,25.2,25.4,27.1-27.3.

References

- 1.Data Communication and Computer Networks – “ Prakash C.Gupta
- 2.Computer Networks Protocols,Standards and Interfaces- “ Uyles Black
3. Data Communications and Computer Networks – Brijendra Singh

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Computer Science)

Semester-V/ Ppr.no.31/ Core - 8

Dot NET Technologies

Unit I

The .NET Platform and the Web: The Web Client/Server Model – Components of ASP.NET and the .NET Framework – Overview of Internet Information Server – Overview of ASP.NET – The .NET Common Language Runtime and Class Library – Managed Components in .NET – Web Services – Language Independence in the .NET Framework – COM+ Component Services and .NET – Direction and plans for .NET. **The VB.NET:** What is VB.NET? – First VB application – Variables, Constants and Operators – Modularizing Code – Functions and Subroutines – Controlling Program Flow – Handling Errors and Exceptions – Object Oriented Programming – Multithread Programming.

Unit II

Working with ASP.NET: The features of ASP.NET – The Anatomy of ASP.NET Pages –Introducing Web Forms – VS.NET Web Applications and other IDE Basics – Separating Content and Code – the Code-Behind Feature – Application Configuration – Using HTML Forms – Using Web Controls – Web Controls for displaying and formatting data –Web Controls for creating buttons – Web control for inputting text – Web controls for selecting choices – Web controls for creating lists – Miscellaneous Basic Controls – Creating a simple ASP.NET Application – ASP.NET Page Directives – ASP.NET Rich Controls – Validation Controls – Data List Controls – User Controls - Saving state with the StateBag Object – ASP.NET Intrinsic Objects.

Unit III

Using the .NET Framework Class Library: Common Features of the .NET Framework Class Library – Using Data Collections – Handling File Input/output and Directories – Watching the File System for Changes – Using the Windows Event Log – Working with Active Directory Services – Using Message Queues – Communicating with Servers on the Internet – Manipulating XML Data – Sending Internet E-mail.

Unit IV

Building .NET Managed Components for COM+: The concept of Managed Code Execution – The Common Language Runtime – COM+ Component Services – Using VB.NET to develop Managed Components – Serviced Components – Building VB.NET Serviced Components. **Building Web Services:** The need for Web Services – Overview of Web Services – Web Service Description Language - Web Service Wire Formats – Web Services Discovery – Creating a simple Web Service – Calling Web Services with Proxy Classes – Creating a Client for a Web Service – Managing State in Web Services – Using Transactions in Web Services.

Unit V

Accessing Data with ADO.NET: Overview of Data Access on the Web – ADO.NET: The next generation of Data-Access Technology – ADO.NET Programming Objects and Architecture – Displaying Database Data – Programming with the DataList and DataGrid Controls – Working with the DataSet and DataTable Objects – Maintaining Data Integrity with the DataRelation Class – Using Manual Database Transactions – Working with Typed DataSet Objects. **Securing .NET Applications:** Windows Security – IIS Authentication and Authorization Security – A crash course in Cryptography – Implementing Data Encryption – ASD.NET Authentication Security.

Text Book

ASP.NET and VB.NET Web Programming –by Matt J. Crouch, Pearson.

Reference Books

1. Upgrading Microsoft Visual Basic 6.0 to .NET - by d Robinson, Michael Bond, Robert Ian Oliver, WP Publishers
2. Visual Basic.NET - by Shirish Chavan, Pearson

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Semester-V/ Ppr.no.32 / Major Practical - 5

Dot NET Practical Listing

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Build a homepage for XYZ Corporation using Web Controls.
2. Create a login page using user control in a web form.
3. Create a simple multiple choice questionnaire. Submit the answers and display the score.
4. Develop a project to input data through a web form to a database and retrieve the data. Use the calendar control to input date.
5. Develop a project to input data through a web form to a database and validate the data. Use the RequiredFieldValidator andRangeValidator Controls.
6. Check whether a given word or phrase is a palindrome using Web Service.
7. Create an online photo gallery using DataList and DataGrid Controls.
8. Develop code to send email from ASP.NET

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Semester-V/ Ppr.no.33(A)/ Major Elective - I (A)

Mobile Computing

Unit I

Basics of Communication Technologies: Components of a Wireless Communication System – Architecture of a Mobile Telecommunication System – Wireless Local Area Networks – Bluetooth Technology. **Introduction to Mobile Computing and Wireless Networking:** What is Mobile Computing ? Mobile Computing vs. Wireless Networking – Characteristics of Mobile Computing – Structure of Mobile Computing Application-Cellular Mobile Communication –Global System for Mobile Communications (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunications System (UMTS).

Unit II

MAC Protocols: Properties required of MAC Protocols – Wireless MAC Protocols : Some Issues- A taxonomy of MAC Protocols –Fixed Assignment schemes – Random Assignment Schemes –Reservation based Schemes. **Mobile Internet Protocol:** Mobile IP – Packet Delivery – Overview of Mobile IP – Desirable features of Mobile IP- Key mechanism used in Mobile IP – Route Optimization – Dynamic Host Configuration Protocol.

Unit III

Mobile Transport Layer: Overview of TCP/IP – Terminologies of TCP/IP – Architecture of TCP/IP – An overview of the operation of TCP – Application Layer Protocols of TCP – TCP in Mobile Networks. **Mobile Databases :** Issues in Transaction Processing – Transaction Processing Environment –Data dissemination – Transaction Processing in Mobile Environment – Data Replication – Mobile Transaction Models – Rollback Process – Two-Phase Commit Protocol – Query Processing – Recovery.

Unit IV

Wireless Sensor Networks: WSN vs. MANET – Applications – Architecture of the Sensor Node – Challenges in the design of an effective WSN – Characteristics of Sensor Networks –WSN Routing Protocols –Target Coverage –Clustered Wireless Sensor Networks. **Operating Systems for Mobile Computing:** Special Constraints and requirements of Mobile O/S- A survey of Commercial Mobile Operating Systems – A Comparative study of Mobile OSs.

Unit V

Mobile Application Development and Protocols: Mobile Devices as Web Clients – WAP – J2ME – Android Application Development. **Mobile Commerce:** Applications of M-Commerce – Business-to-Business(B2B) Applications –Structure of Mobile Commerce –Pros and Cons of M-Commerce – Mobile Payment Systems.

Text Book

Fundamentals of Mobile Computing –by Prasant Kumar Pattnaik, Rajib Mall,, PHI.

Reference Books

1. Wireless and Mobile Communication, T.G. Palanivelu & R. Nakkeeran, PHI Learning Private Limited, 2009
2. Wireless and Cellular Telecommunications, Third Edition William C.Y. Lee, McGraw Hill
3. Mobile Computing Technology, Applications and Service Creation, Asoke K. Talukder & Roopa R. Yavagal, TMH Publication
4. Wireless Communications and Networking made simple, Prof. Satish Jain, Vineeta Pillai, BPB Publications

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Semester-V/ Ppr.no.33(B)/ Major Elective – I (B)

Cryptography and Network Security

UNIT I

Services, mechanisms and attacks – The OSI Security architecture – A model for network Security – Symmetric Cipher model – Substitution techniques – Transposition techniques – Simplified DES – Block Cipher principles – the strength of DES – Block Cipher design principles and modes of operation.

UNIT II

Triple DES – Blow fish – RC5 – Advanced Symmetric Block Ciphers – RC4 Stream Cipher Confidentiality using Symmetric encryption – Introduction to Number theory – Public _ Key cryptography and RSA.

UNIT III

Key Management – Diffie Hellman Key exchange – Message authentication and hash function – Hash algorithms – Digital Signatures and authentication protocols – Digital signature standard.

UNIT IV

Authentication applications – Pretty good privacy – S\MIME – IP security – Web security considerations – Secure sockets Layer Transport layer security – Secure Electronic transaction.

UNIT V

Intruders – intrusion detection – Password management – Viruses and Related threats – Virus countermeasures – Firewall design principles - Trusted Systems.

Textbook :

William Stallings, "Cryptography and Network security Principles and Practice", Fourth edition, Pearson Education Asia.

References:

1. Roberta Bragg, Mark Rhodes – Qusely , Keith Strassberg, "Network Security", Tata McGraw-Hill, 2004.
2. Greg Holden , "Guide to Network Defense and counter measures", Thomson Course Technology, 2003.

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Semester-V/ Ppr.no.33(C)/ Major Elective- I (C)

Cloud Computing

UNIT I:

Introduction Cloud Computing Introduction, From, Collaboration to cloud, Working of Cloud Computing, Pros and Cons, Benefits, Developing Cloud Computing Services, Cloud Service Development, Discovering Cloud Services.

UNIT II:

Cloud Computing For Everyone Centralizing Email Communications, Cloud Computing for Community, Collaborating on Schedules, Collaborating on Group Projects and Events, Cloud Computing for Corporation, Mapping Schedules Managing Projects, Presenting on Road.

UNIT III:

Using Cloud Services Collaborating on Calendars, Schedules and Task Management, Exploring on Line Scheduling and Planning, Collaborating on Event Management, Collaborating on Contact Management, Collaborating on Project Management, Collaborating on Word Processing, Spreadsheets, and Databases.

UNIT IV:

Outside The Cloud Evaluating Web Mail Services, Evaluating Instant Messaging, Evaluating Web Conference Tools, Creating Groups on Social Networks, Evaluating on Line Groupware, Collaborating via Blogs and Wikis.

UNIT V:

Storing And Sharing Understanding Cloud Storage, Evaluating on Line File Storage, Exploring on Line Book Marking Services, Exploring on Line Photo Editing Applications, Exploring Photo Sharing Communities, Controlling it with Web Based Desktops

TEXT BOOK:

Cloud Computing, Michael Miller, Pearson Education, New Delhi, 2009.

REFERENCE BOOK:

1. Cloud Computing, V. K. Pachghare, PHI Learning Pvt Ltd, 2016
2. Cloud Computing, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, TMH, 2010
3. Cloud Computing Bible, Barrie Sosinsky, Wiley Publishing, Inc.

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Semester-VI/ Ppr.no.35/Core - 9
Operating Systems

Unit I

Introduction: What Operating system do – Computer System Organization – Computer System Architecture – Operating System Structures- Operating System Operation. **System Structures:** Operating System Services – System Calls – System Programs – Operating System Design and Implementation- Operation System Generation- System Boot.

Unit II

Process Concept: Process Concept- Process Scheduling –Operation on Processes- Inter Process Communication- Example of IPC System – Communication in Client – Server system. **Process Scheduling** : Basic concept-Scheduling criteria-Scheduling algorithm-Thread scheduling-Multiple Processor Scheduling-Real Time CPU Scheduling-Operating system example- Algorithm evaluation.

Unit III

Synchronization: Background - The Critical section problem-Peterson’s solution - Semaphores – Classic problems of Synchronization. **DeadLocks:** System models-Deadlock Characterization-Methods for handling deadlock - Deadlock Prevention-Deadlock Avoidance-Deadlock detection - Recovery from deadlock.

Unit IV

Memory Management: Background – Swapping - Contiguous Memory allocation – Segmentation – paging. **Virtual Memory Management** : Background - Demand paging - Copy and Write-page replacement-Allocation of Frames - Thrashing.

Unit V

File System : File Concept-Access Method-Directory and Structure--File Sharing-Protection. **Implementing File System:** File System Structure - File System implementation-Directory implementation-Allocation Methods - Free Space Management. **Mass Storage Structure:** Overview of Mass Storage Structure-Disk Structure - Disk Scheduling - Disk Management

Text Book:

Operating System Concepts – Abraham Silberscartz, Peter Baer Galvin, and Greg Gange.

Addison Wesley Publishing Company – Ninth Edition.

Reference Books:

1. Operating System: Internal and Design Principles – Fifth Edition, William Stalling ,PHI Learning Private Limited.
2. Understanding Operating Systes: Ida M.Flynn ,Ann McIverMcHoes.

Relational Database Management System

UNIT I

Introduction: Database - system applications-Purpose of Database Systems - View of Data- Database languages -Relational Databases - Database Design - Data Storage and Querying - Transaction Management - Database Architecture - Data Mining and Information Retrieval- Specialty Databases - Database Users and Administrators – Intelligent Database System.

UNIT II

Introduction to the Relational Model and Introduction to SQL: Structure of Relational Databases -Database Schema-Keys-Schema Diagrams- Relational Query Languages- Relational Operations- Overview of the SQL Query Language -SQL Data Definition-Basic Structure of SQL Queries

UNIT III

SQL operations and Intermediate SQL : Additional Basic Operations-Set Operations- Null values-Aggregate functions- Nested Sub queries-Join Expressions – Views - Transactions- Integrity Constraints - SQL Data Types and Schemas-Authorization

UNIT IV

Entity-relationship(E-R) Modeling – Enhanced Entity-Relationship(EER) Model – Data Normalization

UNIT V

Implementation using Oracle: Creating Table-Modifying Table-Creating SEQUENCE-creating Views-PL/SQL- triggers-Stored procedures and Functions-cursors

Text Book:

- 1.Database System Concepts – Abraham Silberschatz, Henry F.Horth and S.Sudarashan, McGraw-Hill International Sixth Edition.
2. Essentials of Database Management Systems – Alexis Leon, Mathews Leon (Chapter 4,5,8 – IV unit)
3. Oracle8i Jose A.Ramalho BPB Publications

Reference Books:

1. Database Management Systems, R.Panneerselvam, PHI Learning Private Limited
2. Database Management Systems, Ramakrishnan and Gehrke, Mc Graw Hill Publications
3. Relational Database Management Systems,P. Simon Navis, Ave Maria Publications
4. RDBMS Concepts and Database Designing, Dr. R.C. Goyal –Ebook url
http://www.vssut.ac.in/lecture_notes/lecture1423726199.pdf
5. Fundamentals of Database Systems, Ramez Elmasri, Fourth Edition, Pearson Addison Wesley-
EBook URL: http://www.uoitc.edu.iq/images/documents/informatics-institute/Competitive_exam/Database_Systems.pdf
6. An Introduction Relational Database Theory, Hugh Darwen, EBook URL:
<http://www.zums.ac.ir/files/research/site/ebooks/it-programming/an-introduction-to-relational-database-theory.pdf>

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Semester-VI / Ppr.no.37 / Core - 11

Computer Graphics And Visualization

Unit I

Overview of Graphics System: Video Display Devices – Input Devices - Hard Copy Devices – Graphics Software. **Output Primitives:** Points and Lines –Line drawing algorithms – DDA algorithm- Bresenham’s line algorithm- Circle drawing algorithms: properties of circles – Midpointcircle algorithm – Filled Area primitives.

Unit II

Attributes of Output Primitives: Line attributes – Curve attributes – Character attributes. **Two-Dimensional Geometric Transformation:** Basic Transformations – Matrix Representations and homogenous coordinates – Composite and other Transformations - Transformation between coordinate systems.

Unit III

Two-Dimensional Viewing: The viewing pipeline, Viewing co-ordinate reference frame – Window to view port co-ordinate transformation – Two-dimensional viewing function. **Clipping Operations:** Point clipping – Line clipping (only Cohen-Sutherland line clipping) – Polygon Clipping (only Sutherland-Hodgeman polygon clipping).

Unit IV

Interactive Input Methods: Input of graphical data – Input functions – Three dimensional display methods. **Three Dimensional Geometric and Modeling Transformations:** Translation - Rotation - Scaling

Unit V

Three Dimensional Viewing: Viewing Pipeline, Projections. **Visible-surface deduction methods:** Back-face deduction – Depth buffer method-Scan Line Method.**Color Models and Color Applications:** RGB, YIQ, CMY and HSV color models

Text Book:

Computer Graphics C version, Second Edition, Donald Hearn, M.Pauline Baker, Pearson Publications.

Chapters: 2.1, 2.6, 2.7, 3.1, 3.2, 3.5, 4.1, 4.2, 4.5, 5.1 to 5.4, 6.1 to 6.8, 8.2, 8.3, 9.1,11.1 to 11.3, 12.1,12.3, 13.1 to 13.3,13.5, 15.4 to 15.7

Reference Books

1. Express Learning - Computer Graphics and Multimedia-ITL Education Solution Ltd.
2. Computer Graphics-A programming Approach 2/e-Steven Harrington-Mc Graw Hill Education Private Limited.
3. Computer Graphics, Multimedia and Animation - Malay K. Pakhira - PHI

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Semester-VI/ Ppr.no.38/Core - 12

Data Mining

Unit I

Introduction: What is Data Mining – why Data Mining Now – The data Mining Process – Data Mining Applications – Data Mining Techniques – Practical examples of Data Mining – The Feature of Data Mining – Guidelines for Successful Data Mining – Data Mining Software.

Unit II

Association Rule Mining: Introduction – Basics – The Task and Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm – Apriori -TID – Direct Hashing and Pruning DHP-Mining Frequent Patterns without Candidate Generation – Performance Evaluation of Algorithms – Software for Association Rule Mining.

Unit III

Classification: Introduction – Decision Tree – Building a decision Tree- The Tree Induction Algorithm – Split Algorithm Based on the Information Theory – Decision Tree Rules – Decision tree summary – Naïve Bayes Method – Estimating Predictive Accuracy of classification Methods- Other Evaluation Criteria for classification methods – classification software.

Unit IV

Cluster Analysis: What is Cluster Analysis – Desires Features of cluster analysis – – Types of cluster analysis methods – Partitioned Methods – Hierarchical Methods – Density Based Methods- Dealing with Large Databases – cluster Analysis Software.

Unit V

Web Data Mining: Introduction – Web Mining- Web Technology and characteristics – Locality and Hierarchy in the web – Web content Mining – Web Usage Mining – Web Structure Mining – Web Mining Software.

Text Book:

Introduction to Data Mining with Case studies, G.K. Gupta, PHI Third Edition, 2015

Reference Books

1. Data Mining Concepts & Technologies, Jiawei Han, Micheline Kamber, Morgan Kaufmann, Second Edition, 2005.
2. Data Mining, Vikram Pudi, P. Radha Krishna, Oxford University Press, First Edition, 2009.
3. Data Warehousing – Reema Thareja Oxford University Press – 2009.
4. Insight into Data Mining Theory and Practice – K.P. Soman, Shyam Diwakar, V. Ajay, Prentice Hall of India – 2008

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Semester-VI / Ppr.no.39/Major Practical - 6

RDBMS with Oracle Lab Listing

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create an employee database with tables department, employee details, address, pay details and project details. Alter the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.
2. Create queries to retrieve relevant information from a table.
3. Create a table from the existing tables. Create views from the tables.
4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the tables.
5. Create a partition table and query the records.
6. Create the table with abstract data type and query the records.
7. Write a PL/SQL program to print multiplication table
8. Write a PL/SQL program to check whether given string is palindrome or not
9. Write a PL/SQL program to print student details using Report
10. Create a procedure to calculate Electricity bill (use cursor)
11. Write a PL/SQL program to perform updation using various triggers
12. Write a PL/SQL program to find factorial of numbers using function and procedure

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Semester-V/ Ppr.no.40 (A)/ Major Elective - III (A)

BIG DATA ANALYTICS

UNIT I

What Is Big Data and Why Is It Important? - A Flood of Mythic “Start-Up” Proportions - Big Data Is More Than Merely Big - Why Now? - A Convergence of Key Trends - Relatively Speaking - A Wider Variety of Data - The Expanding Universe of Unstructured Data.

Industry Examples of Big Data: Digital Marketing and the Non-line World - Don’t Abdicate Relationships - Is IT Losing Control of Web Analytics? - Database Marketers, Pioneers of Big Data - Big Data and the New School of Marketing - Consumers Have Changed. So Must Marketers. - The Right Approach: Cross-Channel Lifecycle Marketing - Social and Affiliate Marketing - Empowering Marketing with Social Intelligence

UNIT II

Fraud and Big Data - Risk and Big Data - Credit Risk Management - Big Data and Algorithmic Trading - Crunching Through Complex Interrelated Data - Intraday Risk Analytics, a Constant Flow of Big Data - Calculating Risk in Marketing - Other Industries Benefit from Financial Services’ Risk Experience - Big Data and Advances in Health Care - “Disruptive Analytics” - A Holistic Value Proposition - BI Is Not Data Science - Pioneering New Frontiers in Medicine - Advertising and Big Data: From Papyrus to Seeing Somebody - Big Data Feeds the Modern-Day Donald Draper - Reach, Resonance, and Reaction - The Need to Act Quickly (Real-Time When Possible) - Measurement Can Be Tricky - Content Delivery Matters Too - Optimization and Marketing Mixed Modeling - Beard’s Take on the Three Big Data Vs in Advertising - Using Consumer Products as a Doorway.

UNIT III

Big Data Technology : The Elephant in the Room: Hadoop’s Parallel World - Old vs. New Approaches - Data Discovery: Work the Way People’s Minds Work - Open-Source Technology for Big Data Analytics - The Cloud and Big Data - Predictive Analytics Moves into the Limelight - Software as a Service BI - Mobile Business Intelligence is Going Mainstream - Ease of Mobile Application Deployment - Crowdsourcing Analytics - Inter- and Trans-Firewall Analytics - R&D Approach Helps Adopt New Technology - Adding Big Data Technology into the Mix - Big Data Technology Terms - Data Size 101.

UNIT IV

Information Management : The Big Data Foundation - Big Data Computing Platforms (or Computing Platforms That Handle the Big Data Analytics Tsunami) - Big Data Computation - More on Big Data Storage - Big Data Computational Limitations - Big Data Emerging Technologies.

Business Analytics : The Last Mile in Data Analysis - Geospatial Intelligence Will Make Your Life Better - Listening: Is It Signal or Noise? - Consumption of Analytics - From Creation to Consumption - Visualizing: How to Make It Consumable? - Organizations Are Using Data Visualization as a Way to Take Immediate Action - Moving from Sampling to Using All the Data - Thinking Outside the Box - 360° Modeling - Need for Speed - Let's Get Scrappy - What Technology Is Available? - Moving from Beyond the Tools to Analytic Applications.

UNIT V

The People Part of the Equation : Rise of the Data Scientist - Learning over Knowing - Agility - Scale and Convergence - Multidisciplinary Talent - Innovation - Cost Effectiveness -Using Deep Math, Science, and Computer Science - The 90/10 Rule and Critical Thinking - Analytic Talent and Executive Buy-in - Developing Decision Sciences Talent - Holistic View of Analytics - Creating Talent for Decision Sciences - Creating a Culture That Nurtures Decision Sciences Talent - Setting Up the Right Organizational Structure for Institutionalizing Analytics.

Data Privacy and Ethics : The Privacy Landscape -The Great Data Grab Isn't New - Preferences, Personalization, and Relationships - Rights and Responsibility - Playing in a Global Sandbox - Conscientious and Conscious Responsibility - Privacy May Be the Wrong Focus - Can Data Be Anonymized? - Balancing for Counterintelligence – Now What?

TEXT BOOK

Michael Minelli, Michele Chamboss, Ambiga Dhiraj , "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for today's businesses" John Wiley , 2014

REFERENCE BOOKS

1. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, EMC Education Services
2. Bill Franks, Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Wiley, 2012
3. Arvind Sathi, Big Data Analytics: Disruptive Technologies for Changing the Game, MC Press, 2012

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Semester-V/ Ppr.no.40 (B)/ Major Elective - III (B)

ARTIFICIAL NEURAL NETWORKS

UNIT I

Introduction to Neural networks: Neural processing- Neural networks- an overview – the raise of neuro computing – introduction to artificial neural networks : introduction- artificial neural networks – historical development of neural networks – biological neural networks – comparison between the brain and the computer – artificial and biological neural networks – basic building blocks of artificial neural networks – artificial neural network terminologies.

UNIT II

Fundamental models of artificial neural networks: McCulloch-Pits neuron Model-Learning rules. Perceptron networks: Introduction –single layer perceptron –brief introduction to multi layer perceptron networks.

UNIT III

Feedback networks: Introduction- discrete Hopfield net-continuous Hopfield net-relation between BAM and Hopfield nets. Feed forward networks: introduction-back propagation networks.

UNIT IV

Kohonen self - organizing feature maps - counter propagation network: introduction-Full counter propagation network-Forward only propagation network.

UNIT V

Applications of Neural Networks: Applications of neural networks in Arts-Bioinformatics - Knowledge Extraction – Forecasting - Bankruptcy forecasting-Healthcare-Intrusion - Detection.

TEXT BOOK

Introduction to Neural Networks using MATLAB 6.0., S N Sivanandam S Sumathi S N Deepa Tata McGraw Hill, 2006

REFERENCE BOOKS

- 1.Artificial neural Networks B.Yegnanarayana, Prentice Hall India, 2005
- 2.Neural Networks Alogorithms, Applications and programming Techniques, James A Freeman David M Skapura, Pearson Education.
- 3.Neural Networks for Pattern Recognition, Christopher M. Bishop, Indian Edition, OXFORD University Press

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Semester-V/ Ppr.no.40 (C)/ Major Elective - III (C)

INTERNET OF THINGS

UNIT I

M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.

UNIT II

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies.

M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT III

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

UNIT IV

IoT Architecture-State of the Art – Introduction, State of the art,

Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model

UNIT V

IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control.

TEXT BOOK

Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **“From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”**, 1st Edition, Academic Press, 2014.

REFERENCE BOOKS

1. Vijay Madiseti and Arshdeep Bahga, **“Internet of Things (A Hands-on-Approach)”**, 1st Edition, VPT, 2014.
2. Francis daCosta, **“Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”**, 1st Edition, Apress Publications, 2013.