#### BATCH - 2014 SEMESTER – I COMPUTER ARCHITECTURE - PIT701T

#### **Objectives:**

In this computerized world almost everything is automated. This paper brushes out all the Architectural issues pertaining to a computer and equip the students with knowledge on Hardware.

#### Unit-I

Data and number representation- binary-complement representation, BCD-ASCII,conversion of numbers from one Number system to the other, (r-1)'s & r's complement representation, binary arithmetic. Logic gates, basic logic operations, truth tables, Boolean expression, simplification

#### Unit- II

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

#### Unit- III

Pipelining- Arithmetic Pipeline –Instruction Pipeline -Example, Data Dependency, Handling of Branch Instructions -RISC Pipeline- Example, Delayed Load, Delayed Branch-Vector processing- Array processors-Attached Array Processor and SIMD Array Processor.

#### **Unit-IV**

Basic concepts – Semiconductor <u>RAMs</u> - ROMs – Speed - size and cost – Cache memories -Performance consideration – Associative -Virtual memory- Memory Management Requirements Secondary storage.

#### Unit-V

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

#### **Text Books:**

Morris Mano ,*Computer System Architecture*,PH –Publications.
 Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "*Computer Organization*", *McGraw-Hill*, 5th Edition 2002.

#### **Reference Books**

1. William Stallings, "*Computer Organization and Architecture – Designing for Performance*", 6th Edition, Pearson Education, 2003.

2. David A.Patterson and John L.Hennessy, "*Computer Organization and Design: The hardware / software interface*", 2nd Edition, Morgan Kaufmann, 2002.

3. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

#### SEMESTER – I PROBLEM SOLVING USING 'C' - PIT702S

#### Unit-1

Introduction: The Problem Solving aspect top-down-step wise refinement - implementation of algorithms - program verification - efficiency of algorithms analysis of algorithms. Basic Algorithms: Exchange of value of two variables-Summation of set numbers-Factorial Computation-Sine function computation - Generation of Fibbonacci Sequence - Reversing of Digits of an integer - base conversion character to number conversion - Finding Square root -Factoring - GCD - Generating Prime numbers - Finding which number in the fibbonacci series.

#### Unit-2

C Programming Basics: Variables-Constants-Expressions-Operators and their precedence. Basic Input-Output Statements. Control Structures Simple- Programs in C using all the operators and Control structures. Functions: Concept of function-parameters and how they are passed automatic variables, Recursion, Scope and Extent of Variables, Writing Programs using recursive and non-Recursive functions.

#### Unit-3

[12 HRS] Arrays and Strings : Single and Multi dimensional arrays - Character Array as strings - Functions Strings, Writing programs using arrays for strings manipulation of С Pointers : Definition and use of pointers-address operator-pointer variable- pointer arithmeticarrays of pointers-passing arrays to functions-pointers and functions-pointer constants-stringlibrary-functions-pointers to functions

#### Unit-4

Structures and Unions : Declaring and using Structures-operations on Structures-arrays of structures - user defined data type-pointer to structure. Unions : Difference between Unions and structures-operations on a union - scope of a union-Bit fields in structures programming ,example with structure & unions

#### Unit-5

Dynamic Memory Allocation : Library functions for Dynamic Memory allocation-dynamic multidimensional arrays Self Referencing Structures-Files : Introduction-File Structure-File handling functions.

#### **Text Books:**

- 1. Yashavant Kanetkar Let us C Bpb Publications 2006.
- 2. Brian W. Kernighan, Dennis M. Ritchie. 1988. C Programming Language. Pearson Education Asia publication.

#### **Reference Books:**

- 1. J. Rajaram. 2006. C Interview Questions and Answers Firewall Media.
- 2. Yashavant Kanetkar. 1997. C Pearls Bpb Publications.
- 3. Yashavant Kanetkar. Mastering C. Tata McGraw Hill Publication. Yashavant Kanetkar. 2001. Understanding Pointers in C. Bpb Publications

#### [12 HRS]

[12 HRS]

#### [12 HRS]

#### SEMESTER – I RELATIONAL DATABASE - PIT703 MANAGEMENT SYSTEM

#### **Objectives:**

Almost all disciplines are related to computers some way or other. These involves large amount of data. To store these data a proper maintenance of Database is essential. This paper covers all the primary stuff needed to efficiently manage a database and equips the student with different RDBMS techniques.

#### Unit-1

Advantages and Components of a Database Management Systems - Feasibility Study - Class Diagrams - Data types - Events - Normal Forms - Integrity-converting class diagrams to normalized tables - data dictionary.

#### Unit-2

Query basics - computation using Queries - subtotals and GROUP BY command - Queries with Multiple tables - Sub queries - Joins - DDL & DML - Testing Queries.

#### Unit-3

# Effective Design of Forms and Reports - form Layout - Creating forms - graphical objects - Reports - Procedural languages - Data on forms - Programs to retrieve and save data - error handling.

#### Unit-4

Power of application structure- User Interface Features -Transactions - Form Events- Custom reports - distributing applications - Table operations - Data Storage methods - Storing Data columns - Data Clustering and partitioning.

#### Unit-5

#### [12 HRS]

[10 HRS]

Database administration - Development Stages - Application types - backup and recovery - security and Privacy - Distributed databases - Client / Server databases - web as a client/server system - Objects - Object Oriented Databases - integrated applications.

#### **Text Books:**

- 1. Gerald.V.Post. 1999. DataBase Management Systems Designing and Building business Applications. TMH International Edition.
- 2. S. Sumathi, S. Esakkirajan Fundamentals of Relational Database Management Systems Springer Verlag publication may 2007.

#### **Reference Books:**

- 1. Raghu Ramakrishnan. 1999. *DataBase Management Systems, Computer Science Series*. International: Tata McGraw Hill.
- 2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Henry Korth. 2005. *Database system Concepts* McGraw-Hill Science Engineering publication.
- 3. Raghu Ramakrishnan, Peter Stuckey. 1997. *Constraints and Databases*. Kluwer Academic Publications.

### [14 HRS]

[14 HRS]

#### [10 HRS]

#### SEMESTER - I LINUX OPERATING SYSTEM - PIT704

#### **Objectives:**

There is a saying "Know Operating System you will master the working of a Computer". This paper is intended to make the student aware of all concepts related to operating system and make them well versed in Linux Operating System.

#### Unit-1

#### [12 HRS]

[12 HRS]

[12 HRS]

[12 HRS]

Introduction – Operating System – Functions – Types – Linux Operating System: History – Architecture – Linux compared to UNIX – Shells available – Managing File and Directories in Linux – Types of Editor – Vi Editor

#### Unit-2

Window Manager - Configuring Services: SMTP - FTP - Apache Server

#### Unit-3

Arguments, Options and the Environment – User level memory management – File and File I/O

#### Unit-4

Automating Tasks using Shell Script – Variables – Control Structures – Library Interfaces

#### Unit-5

#### [12 HRS]

Programming in Linux: Shell Programming – Gawk programming – Network Programming – C and C++ Programming

#### **Text Books:**

- 1. David Pitts, Bill Ball. 1999. Red Hat Linux 6 .Techmedia Publication.
- 2. Arnold Robbins. 2006. *Linux Programming by Examples: The Fundamentals* . (1<sup>st</sup> ed.) Pearsons Education.
- 3. Mark G. Sobell. 2003. A Practical Guide to Red Hat Linux 8. Addison Wesley Techmedia.

#### **Reference Books:**

- 1. Richard Peterson. 2006. Linux: The Complete Reference. Tata McGraw Hill publication.
- 2. Mark G. Sobell. 2005. A Practical Guide to Linux Commands, Editors, And Shell Programming. Prentice Hall Publication.

#### **SEMESTER – I INTRODUCTION TO INFORMATION - EPIT705T TECHNOLOGY**

#### **Objectives:**

This is the base paper that enables students to understand the purpose and need for this course and shape their career based on the upcoming technologies.

#### Unit-1

[12 HRS] INFORMATION TECHNOLOGY TODAY - An Introduction - Information systems -Software and Data - IT in Business, Industry, Home, Play, Education and Training, Entertainment and Arts, Science, Engineering and Math, Computers in Hiding - The Global Positioning System (GPS) – How GPS Works.

#### Unit-2

**COMPUTER SYSTEM AND DEVICES:** Types of Computers – Anatomy of Computers INPUT-OUTPUT DEVICES - Input Devices - Text Input - Graphics Input - Output Devices -Monitors – Printers.

#### Unit-3

SOFTWARE - Definition - Application Programs - Major Software Issues - WORD PROCESSING and DESKTOP PUBLISHING: Entering and Editing Documents -Formatting Documents - Desktop Publishing for Print and Screen.

#### Unit-4

PROGRAMMING & IT ISSUES: Introduction - Programming Languages - Methods -Programming Techniques - Corporate Development - Computers and Your Health - Viruses -Intelluctual Property Rights - Computer Crime - Burning Issues.

#### Unit-5

IT IN BUSINESS - Corporate Computing - Transaction Processing - Information Tools for Management Control - Marketing, Advertising and Sales - Design, Production and Manufacturing – Business on Internet – Life Outside Office – Careers – Keeping up-to-date.

#### Text Books:

Information Technology - The Breaking Wave - Dennis.P.Curtin, Kim Foley, Kunal Sen, Cathleen Morin – TMH. New Delhi.

#### [12 HRS]

[12 HRS]

#### [12 HRS]

#### SEMESTER – I C PROGRAMMING - PITP101S

#### **Objective:**

To make the student get started with programming stuff and to implement all C features by sample programs.

- 1. Determining a given number is prime or not.
- 2. Pascal's triangle
- 3. String Manipulation
- 2. Matrix Multiplication.
- 3. Finding determinant of a Matrix.
- 4. Finding inverse of a Matrix.
- 5. Euclidean's Algorithm for finding GCD.
- 6. Generating Permutation.
- 7. Computing Combinations.
- 8. Sorting & Searching
- 9. Insertion sort
- 10. Bubble sort
- 11. Selection sort
- 12. Linear search
- 13. Binary search

#### SEMESTER – I LINUX PROGRAMMING PITP102

#### **Objective:**

To make the student get started with Linux shell programming stuff and to implement all Linux commands and features by sample programs.

- Working with Basic Linux Commands
- Implementing Control Structures in shell script Sorting
- Process Management using Pipes Message Passing
- Shell Programming Menu driven Program
- Shell Programming Fibonacci Series
- Shell Programming Sum of the Series
- ✤ Gwak Programming nCr
- Searching for a substring
- ✤ Matrix addition and Subtraction
- Menu driven program for complex number manipulation

#### SEMESTER -II SOFTWARE ENGINEERING PIT806S

**Objectives:** This paper deals with all the concepts involved in developing a project and equip the student with industry ready project implementation techniques.

<u>Unit - I:</u> Software Engineering and Models: Introduction-Characteristics of Software-Software Myths-Process Models: Waterfall Model- RAD Model-Prototyping Model- Evolutionary Process Models.

<u>Unit –II : Requirement Engineering:</u> The Requirements Engineering Process-Software Requirements Documents- Requirements Validation-Evolution.

<u>Unit III:</u>Analysis Model: Elements -Data Modeling –Functional Modeling and Information Flow – Behavioral Modeling-The Mechanics of Structured Analysis- The Data Dictionary.

<u>Unit –IV:</u> Testing: Software Testing Fundamentals -White Box Testing –Basic Path- Control Structure – Black Box Testing-Software Testing strategies-Unit Testing-Integration Testing-Validation Testing-System Testing.

Unit -V: Project Management: Management Spectrum - Formal Technical Reviews.

#### **Text Books :**

1. R.S.Pressman – Software Engineering –Fourth Edition McGraw Hill International edition – 1997.

2. Software Engineering: 5th Edition by Ian Sommerville

#### **Reference Books**

1. Software Engineering Programs Documentation Operating procedures.

2. Carlo Ghezzi, Mehdi Jazayasi, Dino Mandrioloi," Fundamentals of Software Engineering " Phi

Pvt.Ltd., 1991.

3. Schaum's Outline of Software Engineering by David A. Gustafson.

4. Richard Fairley – Software Engineering – (Design, Reliability and Management) – Tata McGraw Hill edition –1983.

### **SEMESTER - II OBJECT ORIENTED PROGRAMMING - PIT807** WITH C++

Unit-1 Introduction to OOP – Overview of C++ - classes – structures – union – friend functions – friend classes - inline functions - constructors - destructors - static members - scope resolution operator - passing objects to functions - function returning objects.

#### Unit-2

Arrays - pointers - this pointer - references - dynamic memory allocation - function overloading – default arguments – overloading constructors – pointers to functions – Ambiguity in function overloading.

#### Unit-3

Operator overloading – member operator function – friend operator function – overloading some special operators like [], (), and comma operator – inheritance – types of inheritance – protected members – virtual base class – polymorphism - virtual function – pure virtual functions.

#### Unit-4

#### Class templates and generic classes - function templates and generic functions - overloading a function template - power of templates - exception handling - derived class exception - over handling generic functions - exception handling function - terminate() unexpected ()- uncaught - exception ().

#### Unit-5

I/O Streams - formatting I/O with ios class functions and manipulators - creating own manipulator – overloading << and >>. – File I/O – name spaces – conversion functions – array based I/O – Standard template library (STL).

#### **Text Books:**

- 1. Herbert Schildt. 1999.C++ The Complete Reference. (3<sup>rd</sup> ed.) Tata McGraw Hill Publication.
- 2. E. Balagurusamy. 2008. Object Oriented Programming using C++ .TataMcGraw Hill Publication.
- 3. Yashavant Kanetkar. 2004. *Object Oriented Programming with C++*. Bpb Publications.

#### **Reference Books:**

- 1. Jain V.K. 2003. *Object Oriented Programming with C++*. Cyber Tech Publication.
- 2. Walter Salvith. 2007. Absolute C++. Addisson Wesley Publication.
- 3. Dr. D.S. Malik. 2008. C++ Programming From Problem Analysis to Program Design. Course Technology Publication.
- 4. Bjarne Stroustrup. 1986. The C++ Programming Language. Addison Wesley Publication.
- 5. Yashavant Kanetkar. 2003.*Test your C++ skills*.Bpb Publications.

#### [12 HRS]

#### [12 HRS]

#### [12 HRS]

## [12 HRS]

#### **SEMESTER – II DATA STRUCTURES & ALGORITHMS - PIT808**

#### **Objectives:**

Data Structures and Algorithm are the fundamental building blocks of Programming. This subject will make the student get acquainted with different storage techniques and also make them to implement the logic using different algorithms.

#### Unit-1

#### [12HRS]

Abstract data types – asymptotic notations – Complexity analysis – arrays – representation of arrays – operations on arrays – ordered lists – polynomials.

#### Unit-2

#### [12HRS]

Singly linked lists – Circular linked lists – Doubly linked lists – general lists – stacks – queues – circular queues – evaluation of expressions.

#### Unit- 3

[12 HRS]

Trees – binary trees – binary tree traversals- binary tree representations – binary search trees – threaded binary trees – application of trees (sets).

#### Unit-4

#### [12 HRS]

Representation of graphs – graph implementation – graph traversals – application of graph traversals – minimum cost spanning trees – shortest path problems.

#### Unit- 5

#### [12 HRS]

Algorithm- Definition- Examples- complexity- Divide and Conquer- Binary search- Maximum and Minimum- Merge sort- Quick Sort- Selection Sort.

#### **Text Books:**

1. Yashavant Kanetkar. 2003. *Data Structures through C++*. BPB Publication.

- 2. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman. 1983. *Data Structures and Algorithms*. Addison-Wesley Publication.
- 3. E.Horowitz, S.Sahni and Mehta. 1999. Fundamentals of Data structures in C++. Galgotia.

#### **Reference Books:**

- 1. Nell B. Dale, Dale. 2002. C++ Plus Data Structures. Jones and Bartlett Publication.
- 2. Mark Allen Weiss. 2006. *Data Structures and Algorithm Analysis in C++ Addison*. Wesley Longman Publication.
- 3. Dinesh P. Mehta, Sartaj Sahni. 2004. *Handbook of Data Structures and Applications*. CRC Publication.

4. Robert Lafore. Sams. 1999. *Teach Yourself Data Structures and Algorithms in 24 Hours*. NetLibrary Publication.

### SEMESTER –II DOT NET FRAMEWORK AND - PIT809 C# PROGRAMMING

#### **Objectives:**

To make the student get exposed with the latest programming concept Dot Net and to equip them with skills related to C# Programming.

#### Unit-1

The Origin of .Net Technology -.Net Vision and Overview-the .Net framework Overview-Major Components of .Net Framework.

#### Unit-2

The Common language runtime-CLR activities for executing a program-Components of CLR-MSIL-JIT-Managed Code - .Net languages-Benefits of the .Net Approach-THE ANATOMY OF .Net Applications.

#### Unit-3

# Introducing C# and its features –Types of applications in Visual C# -Visual Studio IDE-Variables-Data types and Operators.

#### Unit-4

#### Control structures (Branching & Looping)-Methods-Classes-Namespaces-Structs-Enumerations-Interfaces.

#### Unit-5

# Windows Forms-Standard Controls-Overview of ADO.NET Objects-Creating New Data Connection-Accessing data with data adapters and data sets-Displaying data.

#### **Text Books:**

- 1. Yashavant Kanetkar. 2004 C#. NET. Motilal Books of India.
- 2. Peter Drayton, Ben Albahari, Ted Neward. C# in a nutshell. O'Reilley Publication.
- 3. James D. Foxall, Wendy Haro-Chun. 2002. *Sams Teach Yourself C# in 24 Hours*. Sams Pubication.

#### **Reference Books:**

- 1. Herbert Schildt. 2002 C# A Beginner's Guide. Osborne/McGraw-Hill Publication.
- 2. Panikkar Shibi, Kumar Sanjeev. 2005. *Magic of C# with .Net Frame Work Firewall*. Media Publication.
- 3. Herbert Schildt. 2002. C#: The Complete Reference. Osborne: McGraw-Hill Publication.
- 4. E.Balagurusamy. *Programming with C#- 1- Edition*. Tata McGraw Hill Publication.
- 5. Yashavant Kanetkar. 2003C#. NET Fundas. BPB Publication.

#### [12 HRS]

# [12 HRS]

[12 HRS]

[12 HRS]

#### SEMESTER –II **MULTIMEDIA AND VIRTUAL REALITY - EPIT810S**

#### **Objectives:**

To enable the students to learn the concepts of Multimedia.

#### UNIT - I:

WHAT IS MULTIMEDIA: Definitions – Where to use multimedia – Introduction to Making Multimedia: What you need – Macintosh and Windows production platforms.

**TEXT:** The power of meaning – About fonts and faces – Using text in multimedia – Computers and Text – Font editing and Design tools – Hypermedia and Hypertext.

#### UNIT - II:

(13 Hrs)

**SOUND:** The power of sound – Multimedia system sounds – MIDI versus Digital Audio – Digital Audio - Making MIDI audio - Audio, File formats - Working with sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding sound to your multimedia project.

**IMAGES**: Making still Images – Color – Image file formats.

#### **UNIT - III:**

ANIMATION: The Power of Motion - Principles of Animation - Making animations that works.

**VIDEO**: Using Video – How Video works – Broadcast video standards – Integrating computers and television - Shooting and Editing Video - Video tips - Recording formats - Digital Video.

#### UNIT - IV:

PLANNING AND COSTING: Project planning - Estimating - RFPs and Bid Proposals -Designing – Producing.

MULTIMEDIA PACKAGES: Cool3d, Photoshop, Sound forge, Windows Movie maker, Flash- a Simple Project for Multimedia using the Multimedia Packages.

#### UNIT - V:

**INTRODUCTION TO VIRTUAL REALITY**: Introduction to virtual reality – goals of virtual reality- Issues in Virtual Reality- Introduction to VRML.

#### **Text Books:**

1. Tay Vaughan – "Multimedia Making it Work" - McGraw Hill, 1994.

2. John Hayward – Adventures in Virtual Reality, One Publications

#### **Reference Book(s):**

Jeffcoate, Judith - "Multimedia in Practice" - Prentice Hall, 2001.

(12 Hrs)

(12 Hrs)

#### (13 Hrs)

### (10 Hrs)

#### SEMESTER –II OBJECT ORIENTED PROGRAMMING AND -PITP203 DATA STRUCTURES USING C++

#### PRACTICAL – 3

#### **Objective:**

To implement all object oriented programming concepts using C++ and to implement different data structures techniques using it.

- 1. Write a C++ program to illustrate classes with inline functions.
- 2. Write a C++ program to illustrate array objects in classes.
- 3. Write a C++ program to illustrate the role of destructors in classes.
- 4. Write a C++ program to illustrate the overloading of constructors in classes.
- 5. Write a C++ program to illustrate strings as member of classes.
- 6. To illustrate comparison Operator (<) Overloading.
- 7. To illustrate ++ Operator Overloading.
- 8. To illustrate \* Operator Overloading.
- 9. To illustrate the difference among public, protected and private using Inheritance.
- 10. To illustrate the use of friend class.
- 11. To illustrate the concept of pure virtual functions.
- 12. Stack Implementation using arrays.
- 13. Queue Implementation using arrays.
- 14. Stack Implementation using pointers.
- 15. Queue Implementation using pointers.
- 16. Infix to Postfix Conversion.
- 17. Linked List Implementation.

#### SEMESTER –II C# PROGRAMMING - PITP204 PRACTICAL - 4

#### **Objective:**

To make the student abreast with C# Windows forms applications and Database applications using ADO.Net.

- 1. Create custom windows forms in C# with images.
- 2. Create splash screens.
- 3. Create a color chooser using standard controls.
- 4. Develop a ticktacktoe game in C#
  (i) 2 player game-b/w user & computer
  (ii) 2 player game-b/w two different users.
- 5. Create a simple notepad application using menus, rich textbox controls and other necessary controls.
- 6. Create a basic form application which can be used to store the phone numbers along with the name. Create a two field table in MSACCESS and use ADO.NET to connect to this table. Application should provide provisions for adding, updating, viewing and deleting data.
- 7. Write a menu driven application to store the salary details of employees in an Oracle table and provide facilities for adding, updating, viewing and deleting data.