

**ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
CUDDALORE-1**



**PG & RESEARCH DEPARTMENT OF COMPUTER  
SCIENCE**

**MSC.COMPUTER SCIENCE  
SYLLABUS 2017-2018**

**CURRICULUM DESIGN TEMPLATE**

**ADMITTED IN THE YEAR 2017 - 2018**

| <b>Semester</b> | <b>Code</b> | <b>Subject Title</b>   | <b>Hrs/<br/>Week</b> | <b>Credit</b> |
|-----------------|-------------|--|----------------------|---------------|
| I               | PIT701T     | Computer Architecture  | 4                    | 4             |
|                 | PIT702S     | Problem Solving using C  | 4                    | 4             |
|                 | PIT703      | Relational Database Management Systems   | 4                    | 4             |
|                 | PIT704      | Linux Operating System   | 4                    | 4             |
|                 | EPIT705TA   | Elective-1<br>(i)-Introduction to Information Technology*<br>(ii)-Management Information Systems<br>(iii)Object Oriented Analysis and Design | 4                    | 3             |
|                 | EPIT705TB   |  |                      |               |
|                 | EPIT705TC   |  |                      |               |
|                 | PITP101S    | Practical -1 - C-Programming   | 5                    | 3             |
|                 | PITP102S    | Practical- 2 - Linux Programming   | 5                    | 3             |
| <b>Total</b>    |             |  | <b>30</b>            | <b>25</b>     |
| II              | PIT806S     | Software Engineering   | 4                    | 4             |
|                 | PIT807      | Object Oriented Programming using C++  | 4                    | 4             |
|                 | PIT808      | Data Structures and Algorithms   | 4                    | 4             |
|                 | PIT809S     | Dot Net Technology   | 4                    | 4             |
|                 | EPIT810SA   | Elective-II<br>(i)-E- Commerce<br>(ii)-Multimedia and Virtual Reality*<br>(iii) Xml & Web services   | 4                    | 3             |
|                 | EPIT810SB   |  |                      |               |
|                 | EPIT810SC   |  |                      |               |
|                 | PITP203     | Practical-3 - OOP and Data Structures using C++  | 5                    | 3             |
|                 | PITP204S    | Practical-4 Dot Net Lab  | 5                    | 3             |
| <b>Total</b>    |             |  | <b>30</b>            | <b>25</b>     |
|                 | PIT911S     | Web Graphics   | 4                    | 4             |

|              |           |   |           |           |
|--------------|-----------|---|-----------|-----------|
| III          |           |   |           |           |
|              | PIT912    | Java Programming  | 4         | 4         |
|              | ECHR901S  | Human Rights  | 2         | 1         |
|              | EPIT913A  | Elective-III<br>(i)Digital Image Processing<br>(ii)Data Mining*<br>(iii)Mobile Computing              | 4         | 3         |
|              | EPIT913B  |   |           |           |
|              | EPIT913C  |   |           |           |
|              | EPIT914SA | Elective-IV<br>(i)Data Communication and Networks*<br>(ii)Grid Computing<br>(iii)Information Security | 4         | 3         |
|              | EPIT914SB |   |           |           |
|              | EPIT914SC |   |           |           |
|              | PITP305S  | Practical-5 Java Programming  | 6         | 5         |
|              | JPIT306   | Mini project  | 6         | 5         |
| <b>Total</b> |           |   | <b>30</b> | <b>25</b> |
| IV           | JPIT1015  | Main Project  |           | <b>25</b> |

|                     |                              |                 |
|---------------------|------------------------------|-----------------|
| <b>I M.Sc IT</b>    | <b>COMPUTER ARCHITECTURE</b> | <b>PIT701T</b>  |
| <b>SEMESTER – I</b> |                              | <b>HRS/WK-4</b> |
| <b>CORE - 1</b>     |                              | <b>CREDIT-4</b> |

**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 RAMs - 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:**

1. Morris Mano ,Computer System Architecture,PH –Publications.
2. 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.

|                     |                                  |                 |
|---------------------|----------------------------------|-----------------|
| <b>I M.Sc IT</b>    | <b>PROBLEM SOLVING USING ‘C’</b> | <b>PIT702S</b>  |
| <b>SEMESTER – I</b> |                                  | <b>HRS/WK-4</b> |
| <b>CORE - 2</b>     |                                  | <b>CREDIT-4</b> |

**Objectives:**

In the programming world “C” language stands firm in its features and strength. This paper makes the student to get inside the programming stuff and get well acquainted with all the concepts in “C” language.

**Unit-1**

**[12 HRS]**

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 Fibonacci 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 fibonacci series.

**Unit-2**

**[12 HRS]**

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 of Strings, Writing C programs using arrays for strings manipulation Pointers : Definition and use of pointers-address operator-pointer variable- pointer arithmetic-arrays of pointers-passing arrays to functions-pointers and functions-pointer constants-string-library-functions-pointers to functions

**Unit-4**

**[12 HRS]**

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**

**[12 HRS]**

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

|                     |  |                 |
|---------------------|--|-----------------|
| <b>I M.Sc IT</b>    | <b>RELATIONAL DATABASE MANAGEMENT<br/>SYSTEM</b> | <b>PIT703</b>   |
| <b>SEMESTER – I</b> |  | <b>HRS/WK-4</b> |
| <b>CORE - 3</b>     |  | <b>CREDIT-4</b> |

**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**

**[14 HRS]**

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**

**[14 HRS]**

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

**Unit-3**

**[10 HRS]**

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**

**[10 HRS]**

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]**

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.

|                     |                               |                 |
|---------------------|-------------------------------|-----------------|
| <b>I M.Sc IT</b>    | <b>LINUX OPERATING SYSTEM</b> | <b>PIT704</b>   |
| <b>SEMESTER – I</b> |                               | <b>HRS/WK-4</b> |
| <b>CORE - 4</b>     |                               | <b>CREDIT-4</b> |

**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]**

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**

**[12 HRS]**

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

**Unit-3**

**[12 HRS]**

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

**Unit-4**

**[12 HRS]**

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.

|                     |   |                  |
|---------------------|---|------------------|
| <b>I M.Sc IT</b>    | <b>INTRODUCTION TO INFORMATION<br/>TECHNOLOGY</b> | <b>EPIT705TA</b> |
| <b>SEMESTER – I</b> |   | <b>HRS/WK-4</b>  |
| <b>ELECTIVE - 1</b> |   | <b>CREDIT-3</b>  |

**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**

**[12 HRS]**

**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**

**[12 HRS]**

**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**

**[12 HRS]**

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

**Unit-5**

**[12 HRS]**

**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.

|                     |                                       |                  |
|---------------------|---------------------------------------|------------------|
| <b>I M.Sc IT</b>    | <b>MANAGEMENT INFORMATION SYSTEMS</b> | <b>EPIT705TB</b> |
| <b>SEMESTER – I</b> |                                       | <b>HRS/WK-4</b>  |
| <b>ELECTIVE - 1</b> |                                       | <b>CREDIT-3</b>  |

**Objectives:**

This is an interdisciplinary paper which makes the student abreast with management information systems and to make them acquainted with proper management techniques.

**Unit – I**

Definition – Computer based user machine system – Integrated system – Need for a database – Utilization of models – Evolution – Subsystems – Organizational subsystems – Activities subsystems.

**Unit – II**

Basic model – Hierarchical – Specialization – Formalization – Centralization – Modifications of basic organizational structure – Project organization – Lateral relations – Matrix organization – Organizational culture and power organizational change

**Unit – III**

Operating elements – Physical components – Processing functions – Outputs – MIS support for decision making – Structured programmable decisions – Unstructured non-programmable decisions – MIS structure based on management activity and organizational functions – Synthesis of MIS structure

**Unit – IV**

Data representation – Communication network – Distributed systems – Logical data concepts – Physical storage devices – File organizations – Data base organization – Transaction processing

**Unit – V**

A contingency approach to choosing an application – Developing strategy – Lifecycle definition stage – Lifecycle development stage – Lifecycle installation and operation stage – Project management

**Text book:**

Gordon B. Davis, Margrethe H. Olson, Management Information Systems: Conceptual foundations, Structure and development –2nd Edition – Tata-Mc Graw hill International Book Company, 2000

**Reference books:**

1. E.Wainright Martin, Carol V. Brown, Danial W. DeHayes, Jeffrey A. Hoffer, William C. Perkins, "Managing Information Technology" 3rd Edition, Prentice Hall International edition 1999.
2. Harold Koontz, Heinz Weihrich, "Essentials of Management", 5th Edition, Tata McGraw Hill 1998.

|                     |  |                   |
|---------------------|--|-------------------|
| <b>I M.Sc(I.T)</b>  | <b>OBJECT ORIENTED ANALYSIS AND<br/>DESIGN AND UML</b> | <b>EPIT705TC</b>  |
| <b>SEMESTER – I</b> |  | <b>HRS/WK – 4</b> |
| <b>ELECTIVE-1C</b>  |  | <b>CREDIT – 3</b> |

**Objective:**

To enable the students to learn the Software development methods and tools related with Object Oriented Technology.

**UNIT – I: (12 Hrs)**

**OVERVIEW OF OOSD:** Introduction – Methodology – OBJECT BASICS: Objects-Attributes- Encapsulation and Information Hiding – Class Hierarchy – Polymorphism-Object Relationships and Associations-OOSDLC – The Software Development Process.

**UNIT – II: (13 Hrs)**

**OBJECT ORIENTED METHODOLOGIES:** Introduction – Rumbaugh et al.’s Object Modeling Technique – The Booch Technology – Jacobson et al. Methodologies – Patterns – Frameworks – The Unified Approach.

**UNIT – III: (11 Hrs)**

**UNIFIED MODELING LANGUAGE:** Introduction – UML Diagrams – UML Class Diagram – Use Case Diagram – UML DynamicModeling – UML Extensibility – UML Meta model.

**UNIT – IV: (12 Hrs)**

**OBJECT ORIENTED ANALYSIS:** Introdcution – Use Case Model – Developing Effective Documentation  
**OBJECT ORIENTED DESIGN:** Introduction – Axioms – Corollaries – Design Patterns.

**UNIT – V: (12 Hrs)**

**SOFTWARE QUALITY ASSURANCE:** Introduction-Quality Assurance tests – Testing Strategies – Impact of Object Orientation on Testing – Test Cases – Test Plan – Continuous Testing – Myer’s Debugging Principles

**Text Books:**

Ali Bahrami - “Object Oriented Systems Development” - Irwin-McGraw Hill, New Delhi, International editions, 1999.

**Reference Book(s):**

- Grady Booch - “Object –Oriented analysis and Design with Applications” - Pearson Education– Ninth Indian Reprint 2002.
- Grady Booch, James Rumbaugh and Ivar Jacobson - “The Unified Modeling Languages User Guide” - Addison Wesley – Fourth Indian Reprinting 2000.

|                               |                      |                 |
|-------------------------------|----------------------|-----------------|
| <b>I M.Sc IT</b>              | <b>C PROGRAMMING</b> | <b>PITP101S</b> |
| <b>SEMESTER – I</b>           |                      | <b>HRS/WK-5</b> |
| <b>CORE<br/>PRACTICAL - 1</b> |                      | <b>CREDIT-3</b> |

**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

|                               |                          |                 |
|-------------------------------|--------------------------|-----------------|
| <b>I M.Sc IT</b>              | <b>LINUX PROGRAMMING</b> | <b>PITP102S</b> |
| <b>SEMESTER – I</b>           |                          | <b>HRS/WK-5</b> |
| <b>CORE PRACTICAL -<br/>2</b> |                          | <b>CREDIT-3</b> |

**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
- ❖ Write the shell script to find the grade of student's marks.
- ❖ Implementing Control Structures in shell script - Sorting
- ❖ Shell Programming – Menu driven Program
- ❖ Shell Programming – Fibonacci Series
- ❖ Shell Programming – Sum of the Series
- ❖ Write a shell script to perform case conversion.
- ❖ Searching for a substring

**C-Linux**

Matrix addition and Subtraction

Menu driven program for complex number manipulation



|                     |  |                 |
|---------------------|--|-----------------|
| <b>I M.Sc IT</b>    | <b>SOFTWARE ENGINEERING<br/>2016 BATCH</b> | <b>PIT806T</b>  |
| <b>SEMESTER –II</b> |  | <b>HRS/WK-4</b> |
| <b>CORE - 5</b>     |  | <b>CREDIT-4</b> |

**Objectives:**

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

**Unit - I:**

**Software Engineering and Models:** Introduction-Characteristics of Software-Software Myths-Process Models: Waterfall Model- RAD Model-Prototyping Model- Evolutionary Process Models.

**Unit –II :**

**Requirement Engineering:** Requirement Engineering Tasks - Initiating the Requirements Engineering Process- Eliciting Requirements.

**Unit III:**

**Analysis Model:** Elements -Data Modeling –Functional Modeling and Information Flow – Behavioral Modeling-The Mechanics of Structured Analysis- The Data Dictionary.

**Unit –IV:**

**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.

|                     |   |                 |
|---------------------|---|-----------------|
| <b>I M.Sc IT</b>    | <b>OBJECT ORIENTED PROGRAMMING WITH<br/>C++</b> | <b>PIT807</b>   |
| <b>SEMESTER –II</b> |   | <b>HRS/WK-4</b> |
| <b>CORE - 6</b>     |   | <b>CREDIT-4</b> |

**Objectives:**

This paper deals with all the concepts involved in Object oriented programming with reference to C++ and make the student abreast with different OOP concepts.

**Unit-1**

**[12 HRS]**

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**

**[12 HRS]**

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

**Unit- 3**

**[12 HRS]**

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**

**[12 HRS]**

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**

**[12 HRS]**

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 Salwith. 2007. Absolute C++. Addison 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.

|                     |   |                 |
|---------------------|---|-----------------|
| <b>I M.Sc IT</b>    | <b>DATA STRUCTURES &amp; ALGORITHMS</b> | <b>PIT808</b>   |
| <b>SEMESTER –II</b> |   | <b>HRS/WK-4</b> |
| <b>CORE - 7</b>     |   | <b>CREDIT-4</b> |

**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 Method.

**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.

|                      |  |                   |
|----------------------|--|-------------------|
| <b>I M.Sc(IT)</b>    | <b>Dot NET TECHNOLOGY</b><br><b>For the students admitted from the year 2015</b> | <b>PIT809S</b>    |
| <b>SEMESTER – II</b> |  | <b>HRS/WK – 4</b> |
| <b>CORE – 6</b>      |  | <b>CREDIT – 4</b> |

**Objectives:**

- ❖ To enable the students to learn the fundamentals of .NET, .Net Framework and C#.

**UNIT - I: (10 Hrs)**

Introduction to DotNet Technology – Dot Net Framework Overview – Activities of CLR – DotNet Applications – Introduction to Visual Studio IDE – Types of Dotnet Languages.

**UNIT - II: (12 Hrs)**

**INTRODUCTION TO C#** : Introduction to C# - data types in C# - conditional statement, if...else – looping statement, while.../for loop – properties in C# - namespaces in C#.

**UNIT - III: (13 Hrs)**

**INTRODUCTION TO ASP.NET** : Introduction to ASP.NET – architecture of ASP.NET – difference between asp and ASP.NET – page events in ASP.NET – controls in ASP.NET(server side controls and html controls) – the code behind web forms (separation of content & business logic) – life cycle of a web forms page – stages in web forms page – web forms event model.

**UNIT - IV: (12 Hrs)**

**INTRODUCTION TO ADO.NET** : Introduction to ADO.net –ADO.net Architecture – Connection – data reader – command Class.

**UNIT - V: (13 Hrs)**

**DISCONNECTED ARCHITECTURE IN ADO.NET** : Key components of ADO.net disconnected –DataSet class– DataAdapter class – Working with data grids in ASP.NET - with ADO.net

**Text Books:**

1. E. Balagurusamy, “Programming in C#”- Tata Mc Graw Hill, 2002.
2. Chris Ullman, John Kauffman – “Beginning ASP.NET 1.1 with VB.NET 2003”- Wrox Publication.
3. Alex Homer, Dave Sussman – “Professional ASP.NET 1.1” – Wrox Publication.
4. Crouch – “ASP.NET and VB.NET web programming” – Pearson Education.
5. Greg Buczek – “ASP.NET Developer’s Guide” – Tata McGraw Hill 2002.

**Reference Book(s):**

1. Deitel and Deitel – “Internet & World Wide Web how to program” – PHI, 2003.
2. Andrew Troelsen – “C# and the .NET platform” – A Press, 2001.
3. Justin Couch, Daniel H. Steinberg – “J2EE Bible” – Wiley India (P) Ltd., New Delhi 2002.

|                     |                    |                  |
|---------------------|--------------------|------------------|
| <b>I M.Sc IT</b>    | <b>E -COMMERCE</b> | <b>EPIT810SA</b> |
| <b>SEMESTER –II</b> |                    | <b>HRS/WK-4</b>  |
| <b>ELECTIVE - 2</b> |                    | <b>CREDIT-3</b>  |

**Objective:**

Almost all Business that is done in this world is electronically. This paper deals with all issues pertaining to the E-Commerce and equips the students with almost all technical issues regarding E-Commerce.

**Unit-1**

**[12 HRS]**

Electronic commerce environment and opportunities: Background – the electronic commerce environment - electronic marketplace technologies – models of electronic commerce: Overview – electronic data interchange – migration to open EDI – electronic commerce with WWW/Internet – Commerce Net Advocacy – Web commerce going forward.

**Unit-2**

**[12 HRS]**

Approaches to safe electronic commerce: Overview – secure transport protocols – secure transactions – secure electronic payment protocol(SEPP) – Secure electronic transaction(SET) – certificates for authentication – security on web servers and enterprise networks – electronic cash and electronic payment schemes: Internet monetary payment and security requirements – payment and purchase order process – on-line electronic cash.

**Unit-3**

**[12 HRS]**

Internet/Intranet security issues and solutions: The need for computer security – specific intruder approaches – security strategies – security tools – encryption – enterprise networking and access to the internet – antivirus programs – security teams.

**Unit-4**

**[12 HRS]**

MasterCard/visa secure electronic transaction: Introduction – business requirements – concepts – payment processing – E-mail and secure E-mail technologies for electronic commerce: Introduction – The means of distribution A Model for message handling – how does E-mail work? – MIME: Multipurpose internet mail extensions – S/MIME: Secure multipurpose internet mail extensions – MOSS: Message object. Security services – Comparisons of security methods – MIME and related facilities for EDI over the internet.

**Unit-5**

**[12 HRS]**

Internet and web site establishment: Introduction – technologies for web servers – internet tools relevant to commerce – internet applications for commerce – internet charges – internet access and architecture – searching the internet – internet resources: A travelogue of web malls: Introduction – a shopping experience – a travelogue – applications: Advertising on the internet: Issues and technologies: Introduction – advertising on the web – “Marketing 101” – creating a web site.

**Text Books:**

1. Daniel Minoli and Emma Minoli. 1999. Web commerce technology handbook. Tata Mc Graw Hill.
2. Kamallesh K Bajaj and Debjani Nag. 1999. E-Commerce, the cutting edge of business. TataMc Graw Hill.
3. Janice Reynolds. 2004. The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-based Business. Focal Press Publication.

**Reference Books:**

1. Kenneth C. Laudon, Carol Guercio Traver. 2001. E-commerce: Business, Technology, Society. Addison Wesley Publication.
2. Constance H. McLaren, Bruce J. McLaren. 1999. E-commerce: Business on the Internet South. Western Educational Publication.



|                     |                                       |                  |
|---------------------|---------------------------------------|------------------|
| <b>I M.Sc IT</b>    | <b>MULTIMEDIA AND VIRTUAL REALITY</b> | <b>EPIT810SB</b> |
| <b>SEMESTER –II</b> |                                       | <b>HRS/WK-4</b>  |
| <b>ELECTIVE - 2</b> |                                       | <b>CREDIT-3</b>  |

**Objectives:**

To enable the students to learn the concepts of Multimedia.

*UNIT - I:*

*(10 Hrs)*

**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:*

*(12 Hrs)*

**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:*

*(13 Hrs)*

**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:*

*(12 Hrs)*

**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.

|                       |                               |                   |
|-----------------------|-------------------------------|-------------------|
| <b>II M.SC (I.T)</b>  | <b>XML &amp; WEB SERVICES</b> | <b>EPIT810SC</b>  |
| <b>SEMESTER – III</b> |                               | <b>HRS/WK – 4</b> |
| <b>ELECTIVE-2C</b>    |                               | <b>CREDIT - 3</b> |

**Objective:**

- To enable the students to learn the basic concepts of XML and Web Services

**UNIT -I:**

**Introduction:** Role of XML- XML and The Web – XML Languages Basics – SOAP – Web Services – Revolutions of XML – Service Oriented Architecture (SOA).

**UNIT -II:**

**XML Technology:** XML – Name Spaces – Structuring With Schemas and DTD – Presentation Techniques – Transformation – XML Infrastructure.

**UNIT -III:**

**SOAP:** Overview of SOAP – HTTP – XML – RPC – SOAP; Protocol – Message Structure – Intermediaries – Actors – Design Patterns And Faults – SOAP With Attachments.

**UNIT -IV:**

**Web Services:** Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML – SOAP And Web Services In E-Com – Overview of .NET And J2EE.

**UNIT -V:**

**XML Security:** Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines For Signing XML Documents – XML In Practice.

**Text Books:**

1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.

**Reference Books:**

1. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, “ Developing Java Web Services”, Wiley Publishing Inc., 2004.
2. Sandeep Chatterjee, James Webber, “ Developing Enterprise Web Services”, Pearson Education, 2004.
3. McGovern, et al., “Java Web Services Architecture”, Morgan Kaufmann Publishers, 2005.

|                               |  |                 |
|-------------------------------|--|-----------------|
| <b>I M.Sc IT</b>              | <b>OBJECT ORIENTED PROGRAMMING AND<br/>DATA STRUCTURES USING C++</b> | <b>PITP203</b>  |
| <b>SEMESTER –II</b>           |  | <b>HRS/WK-5</b> |
| <b>CORE<br/>PRACTICAL - 3</b> |  | <b>CREDIT-3</b> |

**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.

|                           |   |                   |
|---------------------------|---|-------------------|
| <b>I M.Sc (IT)</b>        | <b>DOT NET LAB</b><br><b>For the students admitted from the year 2015</b> | <b>PITP204S</b>   |
| <b>SEMESTER – II</b>      |   | <b>HRS/WK – 5</b> |
| <b>CORE PRACTICAL - 3</b> |   | <b>CREDIT - 3</b> |

**Objectives:**

- ❖ To enable the student to build applications in DOT NET Languages

**C#.NET**

1. Splash Screen
2. Notepad Application
3. Student Marksheet program and msaccess.
4. Login Form Creation program and msaccess

**ASP.NET**

5. Creating Student Bio-Data.
6. Request and Response Application using C# and Ms-Access.
7. Chatting using application and session object.
8. Application using Ad rotator Control.
9. File uploading and downloading using server object.
10. Telephone Record maintenance and Ms-Access.

|                      |                         |                 |
|----------------------|-------------------------|-----------------|
| <b>II M.Sc IT</b>    | <b>JAVA PROGRAMMING</b> | <b>PIT912</b>   |
| <b>SEMESTER –III</b> |                         | <b>HRS/WK-4</b> |
| <b>CORE - 10</b>     |                         | <b>CREDIT-4</b> |

**Objectives:**

To make the students abreast with some of the rich concepts in Java and to make them industry ready.

**UNIT – I**

**[12 HRS]**

Introduction to Java – Java Buzzwords– Object Oriented Concepts – Data Types – Variables – Arrays – Operators - Control Statements.

**UNIT – II**

**[12 HRS]**

Classes – Objects – Constructors – Overloading method – Access control – Static methods – Inner classes –Inheritance – Overriding methods – Using super – Abstract class-Command-Line Arguments.

**UNIT – III**

**[12 HRS]**

Packages – Importing Packages – Interfaces – Exception Handling – Thread – Synchronization– Runnable Interface – Multithreading-I/O streams-File Streams.

**UNIT –IV**

**[12 HRS]**

String Handling-Java Utilities: Random class-Vector class-Calendar class-Date class-TreeSet class. Working with Windows using AWT classes- Using AWT Controls- Basic concepts of Swing-Architecture of Swing.

**UNIT – V**

**[12 HRS]**

Network Basics: Socket Overview-InetAddress-TCP/IP Server Sockets – Datagrams-RMI-JDBC Connectivity.

**Text Books:**

1. Cay S. Horstman, Gray Cornell – Core Java 2 Vol. I and Vol. II – 7<sup>th</sup> Ed. PHI, 2000.
2. H. Schildt – Java2 (The Complete Reference] – Fourth Edition, TMH 1999.

**Reference Books:**

1. Wesley, K. Arnold and J. Gosling – The Java Programming Language Addison. Pub.
2. Patrick Naughton, Michael Morrison. The Java Handbook . Osborne/McGraw-Hill Pub.
3. James Gosling , Bill Joy, Guy Steele . The Java Language Specification , Addison-Wesley Pub.

|                      |                                 |                 |
|----------------------|---------------------------------|-----------------|
| <b>II M.Sc IT</b>    | <b>DIGITAL IMAGE PROCESSING</b> | <b>EPIT913A</b> |
| <b>SEMESTER –III</b> |                                 | <b>HRS/WK-4</b> |
| <b>Elective – 3</b>  |                                 | <b>CREDIT-3</b> |

**Objectives:**

Digital image Processing is an area which is ever growing in the research side. This paper intends to improve the student’s perspective on research side with an eye opener on Digital image processing.

**UNIT – I** **[10 HRS]**

Introduction : Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21- 44, 50-69).

**UNIT-II** **[14 HRS]**

Image enhancement in the spatial domain : Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement Methods(p.nos76-141).

**UNIT-III** **[12 HRS]**

Image restoration : A model of the image degradation/restoration process, noise models, restoration in the presence of noise—only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos147-167,220-243,256-276).

**UNIT-IV** **[12 HRS]**

Image Compression : Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards (p.nos: 409-467,492-510).

**UNIT-V** **[12 HRS]**

Image Segmentation : Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation (p.nos: 567-617).

**Text Books**

Rafeal C.Gonzalez, Richard E.Woods, Digital Image Processing, , Second Edition, Pearson Education/PHI.

**Reference Books**

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, Image Processing, Analysis, and Machine Vision, Second Edition, Thomson Learning.
2. Adrian Low, Computer Vision and Image Processing, Second Edition, B.S.Publications.
3. William K. Prat ,Digital Image Processing, , Wily Third Edition.
4. Chanda, D. Datta Majumder , Digital Image Processing and Analysis, , Prentice Hall of India, 2003.

|                      |                    |                 |
|----------------------|--------------------|-----------------|
| <b>II M.Sc IT</b>    | <b>DATA MINING</b> | <b>EPIT913B</b> |
| <b>SEMESTER –III</b> |                    | <b>HRS/WK-4</b> |
| <b>Elective – 3</b>  |                    | <b>CREDIT-3</b> |

### **Objectives**

Data Mining is an area which is ever growing in the research side. This paper intends to improve the student's perspective on research side with an eye opener on Data Mining.

### **Unit-I**

**[12 HRS]**

Relation To Statistics, Databases- Data Mining Functionalities-Steps In Data Mining Process- Architecture Of A Typical Data Mining Systems- Classification Of Data Mining Systems - Overview Of Data Mining Techniques.

### **Unit – II**

**[12 HRS]**

Data Preprocessing-Data Cleaning, Integration, Transformation, Reduction, Discretization Concept Hierarchies-Concept Description: Data Generalization And Summarization Based Characterization- Mining Association Rules In Large Databases.

### **Unit – III**

**[12 HRS]**

Classification And Prediction: Issues Regarding Classification And Prediction-Classification By Decision Tree Induction-Bayesian Classification-Other Classification Methods-Prediction- Clusters Analysis: Types Of Data In Cluster Analysis- Categorization Of Major Clustering Methods: Partitioning Methods –Hierarchical Methods

### **Unit –IV**

**[12 HRS]**

Data Warehousing Components -Multi Dimensional Data Model- Data Warehouse Architecture- Data Warehouse Implementation- -Mapping the Data Warehouse to Multiprocessor Architecture- OLAP.-Need- Categorization of OLAP Tools.

### **Unit – V**

**[12 HRS]**

Applications of Data Mining-Social Impacts Of Data Mining-Tools-An Introduction To DB Miner-Case Studies-Mining WWW-Mining Text Database-Mining Spatial Databases.

### **Text Book**

Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2002.



**Reference Books**

1. Alex Berson, Stephen J. Smith, "Data Warehousing, Data Mining, & OLAP", Tata McGraw-Hill, 2004.
2. Usama M. Fayyad, Gregory Piatetsky - Shapiro, Padhraí Smyth And Ramasamy Uthurusamy, "Advances In Knowledge Discovery And Data Mining", The M.I.T Press, 1996.
3. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 1998.
4. Sean Kelly, "Data Warehousing In Action", John Wiley & Sons Inc., 1997.

|                       |                         |                   |
|-----------------------|-------------------------|-------------------|
| <b>II M.SC (I.T)</b>  | <b>MOBILE COMPUTING</b> | <b>EPIT913C</b>   |
| <b>SEMESTER – III</b> |                         | <b>HRS/WK – 4</b> |
| <b>Elective – 3C</b>  |                         | <b>CREDIT - 3</b> |

**Objectives:**

- To provide basics for various techniques in Mobile Communications.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

**UNIT I (12 Hrs)**

**INTRODUCTION:** Mobile and Wireless Devices-Simplified Reference Model-Need For Computing- Multiplexing-Spread Spectrum and Cellular Systems-Medium Access Control-Comparisons.

**UNIT II (12 Hrs)**

**TELECOMMUNICATION SYSTEMS:** Telecommunication systems – GSM – Architecture-Protocols- Hand Over and Security – Satellite Networks - Satellite Systems.

**UNIT III (13 Hrs)**

**WIRELESS LAN:** IEEE 802.11– System Architecture – Protocol Architecture – Blue Tooth – MAC layer –Security and Link Management.

**UNIT IV (12 Hrs)**

**MOBILE IP:** Goals– Packet Delivery– Agent Advertisement and Solicitation - Registration-Tunneling and Reverse Tunneling.

**UNIT V (11 Hrs)**

**WIRELESS APPLICATION PROTOCOL:** Objectives of WAP– Architecture of WAP– WML Features-WML Script.

**Text Book:**

Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, 2/e.Delhi,2000.

**Reference Book(s):**

- Sandeep Singhal,Thomas Bridgman,Lalitha Suryanarayana,Danil Mouney,Jari Alvinen,David Bevis,Jim Chan and Stetan Hild,”The Wireless,Application Protocol:Writing Applications for the Mobile internet”,Pearson Education Delhi,2001.
- Asoke K Talukder,Roopa R Yavagal,”Mobile Computing”,TMG,2006.

|                      |  |                  |
|----------------------|--|------------------|
| <b>II M.Sc IT</b>    | <b>DATA COMMUNICATION AND NETWORKS</b> | <b>EPIT914SA</b> |
| <b>SEMESTER –III</b> |  | <b>HRS/WK-4</b>  |
| <b>Elective - 4</b>  |  | <b>CREDIT-3</b>  |

**Objective:**

To enable the Students to learn the Software development methods and tools related with Object Oriented Technology.

**Unit-I**

Data Communication-Networks\_ Protocol and Standards-Standard Organizations- Basic Concepts-Line Configuration –Topology-Transmission Mode-Categories of Networks – Internetworks –OSI Model-Layered Architecture.

**Unit-II**

Error Detection and Correction – Methods - VRC – LRC – CRC – Checksum - Hamming Code - LAN Architecture- Project 802-Ethernet-Token Bus-Token Ring-FDDI-Comparison.

**Unit-III**

Switching Concepts – Circuit Switching – Packet Switching - Message Switching - Routers-Gateways - Routing Algorithms - Distance Vector Routing - Link State Routing.

**Unit-IV**

Overview of TCP/IP – TCP/IP – Layered Architecture – Network Layer-Addressing – Subnetting – Other Protocols in the Network Layer ARP- RARP – ICMP- IGMP - Transport Layer- TCP- UDP.

**Unit-V**

Client/Server Model- BOOTP –DHCP – DNS – TELNET - FTP – FTP – TFTP – SMTP – SNMP – HTTP – WWW– Introduction to– ISDN- ATM .

**Text Book:**

“Data Communication and Networking” , Behrouz A. Forouzan, Second Edition , THM-2002.

**Reference Books:**

1. William Stallings, "Data and Computer Communications", Prentice Hall of India, 1997.
2. Larry L. Peterson, Bruce S. David, "Computer Networks-A Systems Approach", Morgan Kaufman, 1996.
3. Douglas E. Comer, "Internetworking with TCP/IP-Volume I", Prentice Hall of India, 1997.
4. W. Richard Stevens, "TCP/IP Illustrated Volume I, II", Addison Welsley, 1999.
5. A.S. Tanenbaum, "Computer Networks", Prentice Hall of India, 1998.

|                      |                       |                  |
|----------------------|-----------------------|------------------|
| <b>II M.Sc IT</b>    | <b>GRID COMPUTING</b> | <b>EPIT914SB</b> |
| <b>SEMESTER –III</b> |                       | <b>HRS/WK-4</b>  |
| <b>Elective – 4A</b> |                       | <b>CREDIT-3</b>  |

**Objectives:**

Grid Computing is the latest concept for making use of the data and computing resources. This paper makes the student to get abreast with some of the concepts of Grid Computing.

**UNIT I** **[12 HRS]**

Grid Computing: Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

**UNIT II** **[12 HRS]**

Autonomic Computing, Examples of the Grid Computing Efforts (IBM).

**UNIT III** **[12 HRS]**

Cluster setup & its Advantages, Performance Models & Simulations; Networking Protocols & I/O, Messaging systems.

**UNIT IV** **[12 HRS]**

Process scheduling, Load sharing and Balancing; Distributed shared memory, parallel I/O .

**UNIT – V** **[12 HRS]**

Example cluster System - Beowlf; Cluster Operating systems: COMPaS and NanOS

**Text Book :**

J. Joseph & C. Fellenstein:’ Grid Computing ‘, Pearson Education.

**Reference Books :**

1. Raj Kumar Buyya:’High performance cluster computing’, Pearson Education.
2. Neilsen & Chung L:’Quantum computing and Quantum Information’, Cambridge University Press

|                       |                             |                   |
|-----------------------|-----------------------------|-------------------|
| <b>II M.SC (I.T)</b>  | <b>INFORMATION SECURITY</b> | <b>EPIT914SC</b>  |
| <b>SEMESTER – III</b> |                             | <b>HRS/WK – 4</b> |
| <b>Elective – 4C</b>  |                             | <b>CREDIT - 3</b> |

**Objective:**

□ To help the students to understand the importance of information security and security Mechanisms

**UNIT-I:**

**Introduction:** Security Attacks (Interruption, Intersection, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access control and Availability) and Mechanisms, A model for Internet work security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking and man-in-the-middle attacks.

**UNIT -II:**

**Encryption:** Conventional Encryption Principles, Conventional encryption algorithms, cipher lock modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

**UNIT -III:**

**Cryptography:** Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certification, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

**UNIT -IV:**

**Email privacy:** Pretty Good Privacy (PGP) and S/MIME. IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**UNIT -V:**

**Web Security Requirements:** Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3, Intruders, Viruses and related threats Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

**Text Books:**

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W Manzuik and Ryan Permech, Wiley Dreamtech. Master of Computer Applications 44.

**Reference Books:**

1. Fundamental of Network Security by Eric Maiwald ( Dreamtech press)
2. Network Security – Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Principles of Information Security, Whitman, Thomson

|                       |                     |                   |
|-----------------------|---------------------|-------------------|
| <b>II M.Sc (IT)</b>   | <b>Mini Project</b> | <b>JPIT306</b>    |
| <b>SEMESTER - III</b> |                     | <b>HRS/WK-6</b>   |
| <b>Core Practical</b> |                     | <b>CREDIT - 5</b> |

**Objective:**

The main objective of this Mini project is to expose the students to get a broad idea to develop project.

|                               |                         |                 |
|-------------------------------|-------------------------|-----------------|
| <b>II M.Sc IT</b>             | <b>JAVA PROGRAMMING</b> | <b>PITP305S</b> |
| <b>SEMESTER –III</b>          |                         | <b>HRS/WK-6</b> |
| <b>CORE<br/>PRACTICAL - 5</b> |                         | <b>CREDIT-5</b> |

**Objectives:**

To improve the programming skills of the students with respect to Java and to make the student to cop up with the latest programming concepts.

1. Determining the order of numbers generated randomly using Random class.
2. Usage of Vector Classes.
3. Substring Replacement using StringBuffer class.
4. Application using Interface.
5. Application using Method Overriding.
6. Application using Synchronization-Runnable interface.
7. Application using File Streams (Sequential file)
8. Application using File Streams (Random file)
9. Database creation for Storing and Retrieving student information.
10. Remote command Execution application using Client and Server.
11. Chatting application using TCP/IP
12. Working with Frames and Various Controls
13. Arithmetic Operations using Grid Layout
14. Incorporating Graphics
15. Font animation using Applets Interface



## **THEORY EXAMINATION**

### **Continuous internal assessment (CIA) (25 marks)**

|                           |                 |
|---------------------------|-----------------|
| Two internal Examinations | 15 marks        |
| Assignment / Seminar      | 10 marks        |
| <b>Total</b>              | <b>25 marks</b> |

### **External Examination (75 marks)**

#### **Question Pattern**

#### **M. Sc Information Technology**

**Time: 3 Hours**

**Max. Marks: 75**

#### **Section – A (5 X 5 = 25)**

**(Answer any FIVE questions out of EIGHT)**

One question from each unit and three questions from important topics with problems and programs

#### **Section – B (5 X 10= 50)**

**(Answer any FIVE questions out of EIGHT)**

One question from each unit and three questions from important topics with problems and programs