PONDICHERY UNIVERSITY
(A CENTRAL UNIVERSITY)

B.Sc. Information Technology
(Choice Based Credit System)

Regulations & Syllabus

2017-18 onwards
1. **Aim of the Course**

The B.Sc. (Information Technology) course aims to impart the students with fundamental and hands on knowledge of computers, information technology and communication and information technology management.

2. **Eligibility of Admission**

Candidates for admission to B.Sc. (IT) shall be required to have passed 10 + 2 system of Examination or equivalent with Mathematics / Business Mathematics / Computer Science/ Computer Applications as one of the subjects of study.

3. **Lateral Entry Admission**

Candidates who have passed Diploma in Computer Science / Information Technology/ Computer Technology / Computer Application in I Class (10+3 years of study) are eligible to apply for the lateral entry to the 2nd year of the course subject to availability of seats, but limited to 10% of the sanctioned intake.

4. **Duration of the course**

The course shall be of three years’ duration spread over six consecutive semesters. The maximum duration to acquire prescribed number of credits in order to complete the Programme of Study shall be twelve consecutive semesters (six years).
5. Medium

The medium of instruction shall be English.

6. Course Structure

<table>
<thead>
<tr>
<th>Category</th>
<th>Course Name</th>
<th>Number Of Papers</th>
<th>Credits Per Paper</th>
<th>Total Credits</th>
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<tbody>
<tr>
<td>MIL</td>
<td>Modern Indian Languages</td>
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<tr>
<td>ENG</td>
<td>English</td>
<td>2</td>
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<tr>
<td>AECC</td>
<td>Ability Enhancement Compulsory Course</td>
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<td>SEC</td>
<td>Skill Enhancement Course</td>
<td>4</td>
<td>2</td>
<td>8</td>
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<tr>
<td>GE</td>
<td>Generic Elective Course</td>
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<td>3</td>
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<td>DSC</td>
<td>Discipline Specific Core Course</td>
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<td>Theory - 12</td>
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<td>Practical - 9</td>
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<td></td>
<td>Project - 1</td>
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<td>DSE</td>
<td>Discipline Specific Elective Course</td>
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<td>24</td>
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<td>OE</td>
<td>Open Elective Course</td>
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**Total 120**

**MIL, ENG, AECC**

The crediting of MIL, ENG and AECC courses is as per Pondicherry University UG CBCS regulations.

**DSC and DSE**

At least 60% (72 credits) of the total minimum credit requirement must be earned by the student from DSC and DSE courses as follows in order to obtain the degree - 60 credits from Discipline Specific Core and 12 credits from Discipline Specific Elective courses.
SEC

Out of the 4 Skill Enhancement Courses, two courses viz. – i) Online Course / In-Plant Training (2 weeks) / One month Internship / mini project and ii) soft skills are mandatory. The Online Course to be studied, the organization to be chosen for In-Plant Training or One month internship is to be validated or approved by a panel of members comprising of the Department Faculty, before a student pursues the same.

For the remaining 2 SEC courses, any of the 2 credit Skill Enhancement Courses specified in the curriculum (B.Sc. IT) could be credited or substituted with Skill Enhancement Courses in the curriculum of other UG computer science courses or Skill Enhancement Courses of other UG Non-Computer Science Disciplines of study that constitute to skill development or an assortment of these without any overlap of courses.

GE

Any 2 of the 3 credit Generic Elective Courses specified in the curriculum (BCA) could be credited to constitute the 6 credits or substituted with Generic Elective courses in the curriculum of other UG Computer Science Disciplines of study or UG Courses of Non-Computer Science Disciplines of study that add proficiency to the students - with the advice of the Faculty Advisor, or an assortment of these without any overlap of courses.

DSE

The six 4 credit papers to be credited under DSE can be credited from Discipline Specific Elective specialization stream courses as follows:

I. Three of the 4 credit courses should be credited from one specialization stream courses or across the different specialization stream courses specified in the curriculum.

II. The remaining three of the 4 credit courses may be credited from
   a. Another specialization stream courses of the curriculum or across the different specialization stream courses specified in the curriculum without any overlap of courses credited in I above.

   or
b. Another specialization stream courses or across the different specialization stream courses in the curriculum of other UG Computer Science Disciplines of study without any overlap of courses credited in I above.

or

c. An assortment of the above options in II a and IIb.

**OE**

Any 2 of the 3 credit Open Elective Courses specified in the curriculum (B.Sc. IT) could be credited to constitute the 6 credits or substituted with Open elective courses in the curriculum of other UG Computer Science disciplines of study or substituted with UG Courses of Non-Computer Science Disciplines of study that add proficiency to the students - with the advice of the Faculty Advisor or an assortment of these without any overlap of courses.

**7. Faculty to Students Ratio**

The Faculty to Student Ratio in all the practical / laboratory classes shall be maintained at 1:25.

**8. Pattern of Examination**

I. The End-Semester examination and internal assessments for MIL, ENG, AECC, DSC, GE and OE courses are as per Pondicherry University UG CBCS regulations.

II. All SEC courses (except Online Course / In-Plant Training (2 weeks) / One month Internship) to be treated as a practical / laboratory course and the End-Semester examination to be conducted as per Pondicherry University UG CBCS regulations.

III. The internal assessments for all practical / laboratory courses (for DSC, SEC courses) shall be as follows – 15 marks from two internal practical / laboratory assessment tests and 5 marks based on practical / laboratory course based mini application development.

IV. The internal assessment for DSE courses shall be conducted as follows - 12 marks from two internal assessment tests and 8 marks based only on two internal practical / laboratory assessment tests.
V. The marks for attendance (5 marks) applies to all courses and the awarding of attendance marks is as per Pondicherry University UG CBCS regulations.

VI. The Project work is to be evaluated as follows:
   i. The internal assessment (25 marks) is awarded as follows:
      a. 10 marks is awarded based on two internal project reviews conducted in periodic intervals by a panel comprising of members of the Department during the tenure of the project.
      b. The student’s project guide awards 10 marks for the project work and 5 marks for attendance (attendance marks as specified in the Pondicherry University UG CBCS regulations).
   ii. The End Semester Examination assessment (75 marks) is evaluated under two aspects viz – i) Project Work – (50 marks) ii) Project Report and Viva-Voce (25 marks)

Passing Minimum

Passing Eligibility and classification for the award of the Degree is as per Pondicherry University UG CBCS regulations.

Lateral Entry

The Lateral Entry students have to complete 102 credits from the DSC, DSE, GE, SE, OE courses as per curriculum (IIIrd to VIth semesters). In addition, they should complete the two AECC courses (4 credits) for the award of the degree. One MIL (3 credits) and one ENG (3 credit) courses also need to be completed, if it is not studied in the last three years of the course eligible for lateral entry admission.

Other aspects of CBCS not covered in this document by default conforms to the Pondicherry University UG CBCS regulations.
# PROPOSED STRUCTURE OF THE COURSE UNDER CBCS 2017-2018

## FIRST SEMESTER

<table>
<thead>
<tr>
<th>COURSE</th>
<th>SUBJECT CODE</th>
<th>Paper</th>
<th>CREDITS</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>MIL</td>
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<td>ENGL112</td>
<td>English-I</td>
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<td>DSC-1</td>
<td>CSIT113</td>
<td>Introduction to Problem Solving using C</td>
<td>3</td>
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<td>CSIT114</td>
<td>Digital Electronics</td>
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<td>AECC-1</td>
<td>PADM115</td>
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**TOTAL** | **18** | **30**

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<td>DSC-4</td>
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**TOTAL** | **21** | **30**
### THIRD SEMESTER

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<td>DSC-8(lab)</td>
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**TOTAL** 21 30

### FOURTH SEMESTER

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**TOTAL** 21 30
### FIFTH SEMESTER

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<th>Paper</th>
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Bachelor of Science (INFORMATION TECHNOLOGY)

under CHOICE-BASED CREDIT SYSTEM (CBCS)

(Effective from the academic year 2017-2018)
INTRODUCTION TO PROBLEM SOLVING USING C

Prerequisite: - Basic knowledge of Mathematics and Computers

Objectives:
• To learn the concepts of “C” Programming
• To learn how to use develop software programs for day-to-day applications.

MODULE – I

MODULE- II

MODULE – III
C Functions - Program Modules in C - Math Library Functions – Functions- Function Definitions -Function Prototypes: A Deeper Look - Function Call Stack and Stack Frames- Passing Arguments By Value and By Reference - Recursion vs. Iteration - C Arrays - Defining Arrays - Passing Arrays to Functions- Sorting Arrays- Searching Arrays - Multidimensional Arrays

MODULE – IV
C Pointers- Pointer Variable Definitions and Initialization- Pointer Operators- Passing Arguments to Functions by Reference - size of Operator - Pointer Expressions and Pointer Arithmetic- Relationship between Pointers and Arrays - Pointers to Functions - C Characters and Strings – Character - Handling Library- String-Conversion Functions - Standard Input/Output Library Functions- String-Manipulation Functions -C Formatted Input/Output

MODULE – V
C File Processing - Files and Streams- Creating a Sequential-Access File- Reading Data from a Sequential-Access File - Random-Access Files - Creating a Random-Access File- Writing Data Randomly to a Random-Access File- Reading Data from a Random-Access File- C Preprocessor

Text Books:
LIST OF EXERCISES

1. Simple C programs
2. Program to illustrate control statements
3. Program to illustrate FOR loop
4. Program to illustrate SWITCH & WHILE statements
5. Program to illustrate functions
6. Program to illustrate user-defined functions
7. Program to illustrate arrays
8. Program to illustrate usage of pointers
9. Program to illustrate character handling libraries.
10. Program to illustrate string manipulation
11. Program to illustrate creation of files & streams.
12. Program to illustrate creation, reading & accessing sequential & random files
Prerequisite: Basic knowledge about computers

Objectives:
- To introduce the fundamentals of digital system design.
- To lay strong foundation to the combinational and sequential logic.
- To educate from basic concepts to advanced system design.

MODULE – I
Number systems & Conversions – Arithmetic of number systems – binary codes – BCD – The excess – 3 code – the gray code – ASCII – EBCDIC

MODULE – II

MODULE – III

MODULE – IV

MODULE – V

TEXT BOOK:
LIST OF EXERCISES

1. Study of Logic Gates
2. Design of Adder and Subtractor
3. Design and Implementation of Code Convertors
4. Design of 4-Bit Adder and Subtractor
5. Design and Implementation of Magnitude Comparator
6. 16 Bit Odd/Even Parity Checker and Generator
7. Design and Implementation of Multiplexer and Demultiplexer
8. Design and Implementation of Encoder and Decoder
9. Design and Implementation of 3 Bit Synchronous Up/Down Counter
10. Design and Implementation of Shift Register
11. Simulation of Logic Gates
12. Simulation of Adder and Subtractor
13. Design of 4-Bit Adder and Subtractor
Paper Code: CSIT123

PYTHON PROGRAMMING

Prerequisite: Knowledge of any programming language

Objectives:
- To learn about the fundamentals of computers
- To learn how to install Python, start the Python shell
- To learn to perform basic calculations, print text on the screen and create lists, and perform simple control flow operations using if statements and for loops
- To learn how to reuse code with functions

MODULE – I
Computer Systems - Python Programming Language Computational Thinking - Python Data Types - Expressions, Variables, and Assignments – Strings – Lists – Objects & Classes – Python standard library

MODULE – II
Imperative programming – Python modules – print() function – functional eval() - Execution Control Structures – user-defined functions python variables & assignments parameter passing

MODULE – III
Text Data, Files & Exceptions – Strings revisited – formatted output – files – errors & exceptions - Execution Control Structures – decision control & the IF statement

MODULE – IV
Container and Randomness – Dictionaries – other built-in container types – character encodings & strings – module random

MODULE – V
FOR loop & Iteration Patterns – two-dimensional lists- while loop – more loop patterns – additional iteration control statements- namespaces – encapsulation in functions – global vs local namespaces exceptional flow control – modules as namespaces

Text Books:
LIST OF EXERCISES

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user’s choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
   - Grade A: Percentage >=80
   - Grade B: Percentage>=70 and <80
   - Grade C: Percentage>=60 and <70
   - Grade D: Percentage>=40 and <60
   - Grade E: Percentage<40
3. Program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number.
6. Program to find sum of the following series for n terms: \(1 - 2/2! + 3/3! - - - - - n/n!\)
7. Program to calculate the sum and product of two compatible matrices.
8. Program to calculate the mass \(m\) in a chemical reaction. The mass \(m\) (in gms) disintegrates according to the formula \(m=60/(t+2)\), where \(t\) is the time in hours. Sketch a graph for \(t\) vs. \(m\), where \(t=0\).
9. A population of 1000 bacteria is introduced into a nutrient medium. The population \(p\) grows as follows:
   \[ P(t) = \frac{(15000(1+t))/(15+ e)} \]
   where the time \(t\) is measured in hours. WAP to determine the size of the population at given time \(t\) and plot a graph for \(P\) vs \(t\) for the specified time interval.
10. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
    - I. velocity wrt time \((v=u+at)\)
    - II. distance wrt time \((s=u*t+0.5*a*t^2)\)
    - III. distance wrt velocity \((s=(v^2-v*u)/2*a)\)
DATA STRUCTURES & ALGORITHMS

Prerequisite: Knowledge of any programming language

Objectives:
- To acquaint students with data structures used when programming for the storage and manipulation of data.
- The concept of data abstraction and the problem of building implementations of abstract data types are emphasized.
- Data Structure Algorithms for stack, queues, linked list, trees, graphs, sorting and searching.

MODULE-I
Definition of a Data structure - primitive and composite Data Types, Arrays, Operations on Arrays, Ordered lists - Stacks - Operations - Applications of Stack - Infix to Postfix Conversion.

MODULE-II

MODULE-III
Trees: Binary Trees - Operations - Graph - Definition, Types of Graphs, Graph Traversal - DFS and BFS.

MODULE-IV

MODULE - V
Role of algorithms in computing - Sorting and Searching Techniques - Elementary sorting techniques –Bubble Sort, Insertion Sort, Merge Sort, Quick Sort

Text Books
Paper Code: CSIT129

DATA STRUCTURES & ALGORITHMS LAB

LIST OF LAB EXERCISES

1. Implementation of stack
2. Implementation of Queue
3. Implementation of Singly Linked List
4. Implementation of Doubly linked list
5. Implementation of Binary tree and traversals (BFS & DFS)
6. Implementation of Insertion sort
7. Implementation of Selection Sort
8. Implementation of Quick sort
9. Implementation of Merge sort
10. Implementation of Infix to Postfix & Infix to Prefix notations.
OBJECT ORIENTED PROGRAMMING USING JAVA

**Prerequisite:** Basic Knowledge of programming

**Objectives:**
- On successful completion of the course the students should have understood the object oriented programming in java
- Should have idea about GUI bases programming
- Should have idea about database programming

**MODULE – I**
Introduction – Introduction to java applications – Introduction to classes, objects, methods & Strings - Control statements - Arrays

**MODULE – II**
Class & Objects – constructor – function overloading & overriding - Inheritance - Polymorphism – Interface – package - exception handling - Introduction to Multithreading

**MODULE – III**

**MODULE – IV**
Files, Streams & Object Serialization – Introduction – Files & Streams – Sequential Access Text Files – Object Sterilization

**MODULE – V**

**Text Books:**
LIST OF EXERCISES

1. Program to illustrate various date types in Java.
2. Program to illustrate class and objects.
3. Program to illustrate control structures (if-then, while, switch).
4. Program to illustrate the concept of arrays (creation, initialization and processing).
5. Program to illustrate Multidimensional arrays.
6. Program to illustrate Constructor and its overloading.
7. Program to illustrate Inheritance and Packages.
8. Program to illustrate Interface and static methods.
9. Program to illustrate modifiers protected, this, final and super.
10. Program to illustrate Exception Handling Technique.
11. Program to illustrate input/output streams.
12. Program to illustrate File handling technique.
13. Program to illustrate threading.
14. Program to illustrate simple Java applets.
15. Program to illustrate database programming
INFORMATION THEORY AND CODING

Prerequisite: Knowledge of Probability

Objectives
- Students will learn about Information Theory, Entropy and Probability.
- To understand Source Coding, Channel Coding, Error Detection and Correction, Error Control Coding and various types of codes

MODULE I:
Introduction to Probability, Sample space and events, The axioms of probability Elementary theorems –Conditional Probability and Independence, Baye’s theorem. Random variables, discrete probability distribution, discrete functions for random and discrete random variables, continuous random variables.

MODULE II

MODULE III
Discrete memory less channel, channel capacity BSC and other channels.

MODULE IV
Information measure for continuous ensembles capacity of AWGN channel. Error control coding. The channel coding Theorem, Application to BSC, Source Coding with fidelity criteria. Types of codes, error and error control strategies, Linear block codes, syndrome and error detection, Minimum distance, Error detecting and correcting capabilities of a block code, Syndrome decoding, Hamming codes.

MODULE V
Cyclic codes, Generator and parity – check matrices, encoding, syndrome computation and error detection and decoding.

Text Books:

REFERENCE BOOKS
COMPUTER NETWORKS

Prerequisite: Basic knowledge of computers

Objectives:
1. Given an environment, after analyzing the channel characteristics, appropriate channel access mechanism and data link protocols are chosen to design a network.
2. Given an environment, analyzing the network structure and limitations, appropriate routing protocol is chosen to obtain better throughput.
3. Given various load characteristics and network traffic conditions, decide the transport protocols and timers to be used.

MODULE –I
Introduction to Networks – Topology - Network Architecture - Reference Models - Example Networks – Transmission Medias

MODULE –II

MODULE –III

MODULE –IV
Application layer - Domain Naming System - DNS Namespace, Resource Records, Name Servers - Electronic mail - Architecture and Services, The User Agent, Messages Formats, Message Transfer

MODULE –V

TEXT BOOK
SOFTWARE ENGINEERING

Prerequisite: Basic knowledge of programming

Objectives:
- Identify, formulate, and solve software engineering problems, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements
- Elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of a software project.
- Need to function effectively as a team member
- Understanding professional, ethical and social responsibility of a software engineer
- Participate in design, development, deployment and maintenance of a medium scale software development project.

MODULE – I

MODULE – II
Software Requirements: Analysis & Specifications – requirements engineering – type of requirements – feasibility studies – requirements elicitation – requirement analysis – requirement documentation – requirement validation – requirement management – Case studies

MODULE – III
Software Project Planning – size estimation – cost estimation – models – Constructive cost model – software risk management – software design – what is design – modularity – strategy of design – function oriented design - object oriented design

MODULE – IV

MODULE – V
Software testing – strategic approach to software testing – terminologies – functional testing – structural testing – levels of testing – validation testing – the art of debugging – testing tools

Text Book:
1. Studying various phases of Water-Fall Model.
2. Prepare SRS for Banking or Online book store domain problem
4. Calculate effort using FP oriented estimation model
5. Analyze the Risk related to the project and prepare RMMM plan.
6. Develop Time-line chart and project table using PERT or CPM project scheduling methods.
7. Draw E-R diagram, DFD, CFD and STD for the project.
8. Design of the test cases.
9. Prepare FTR. Version control and change control for software configuration item
DATABASE MANEGEMENT SYSTEM

Prerequisite: Knowledge of data structures and file-handling

Objectives:
- To learn about the basics of database management systems (DBMS), with an emphasis on how to organize, maintain and retrieve efficiently, and effectively the information from a DBMS.
- To learn the fundamental concepts of the relational model, including relations, attributes, domains, keys, foreign keys, entity integrity and referential integrity.
- To learn how to normalize the data using 1st, 2nd & 3rd normal forms
- To define and manipulate the relational databases in SQL.

MODULE - I

MODULE - II
Entity-Relationship Model - Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, ISA relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, aggregation and composition - advantages of ER modeling.

MODULE - III

MODULE - IV
Structured Query Language - Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Data Manipulation Language, Data Control Language - Table Modification Commands – primary & foreign keys

MODULE - V

Text Books

LIST OF EXERCISES

DBMS

For any TWO online application such as library information system, students; information system, employee information systems, payroll system, ticket reservation system etc., do the followings:

1. Create database and establish relationships between tables
2. Draw ER diagrams
3. Create view to extract details from two or more tables
4. Create stored procedures
5. Create functions
6. Create cursors & database triggers.
7. Create PL/SQLs.
Paper Code: CSIT242

DIGITAL SIGNALS PROCESSING

Prerequisite: Basic knowledge of computers and signals

Objectives:

- To learn the concepts of frequencies and sampling.
- To understand the needs of filtering methods.
- To understand the different types of signals.

MODULE-1

MODULE-II

MODULE-III
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

MODULE-IV
Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

MODULE-V

TEXT BOOKS:

REFERENCES:
Paper Code: CSIT351

OPERATING SYSTEMS

Prerequisite: Knowledge of computers & computer organization

Objectives:
- To learn Structure and functions of OS
- To learn Processes and Threads, Scheduling algorithms
- To learn Principles of concurrency and Memory management
- To learn I/O management and File systems

MODULE - I

MODULE - II

MODULE - III

MODULE - IV

MODULE - V

Text Books:
LIST OF EXERCISES

1. Memory allocation - Mono-programming
2. Memory allocation - Multi-programming
3. Job Scheduling – Mono - programming
4. Job Scheduling – Multi - programming
5. Process Scheduling – Round Robin
6. Process Scheduling - FIFO
7. Process Scheduling - SJF
8. Process Synchronization
9. General File Management
WEB TECHNOLOGY

Prerequisite: Knowledge of Operating system, computer network, DBMS, and java language.

Objectives:
- To inculcate knowledge of web technological concepts and functioning of internet
- To learn and program features of web programming languages.
- To understand the major components of internet and associated protocols.
- To design an innovative application for web.

MODULE – I

MODULE - II

MODULE – III
Client-Side Programming: JavaScript Language - History and versions of JavaScript - Introduction to JavaScript - JavaScript in Perspective - Basic Syntax - Variables and Data Types - Statements - Operators - Literals - Functions - Objects - Arrays - Built-in Objects - Host Objects: Browsers and the DOM - Introduction to the Document Object Model - Intrinsic Event Handling - DOM History and Levels -

MODULE – IV
Server-Side Programming: Java Servlets - Model-View-Controller Paradigm - Servlet Architecture Overview - Servlets Generating Dynamic Content - Servlet Life Cycle - Parameter Data

MODULE – V
Sessions - Cookies - URL Rewriting - Servlets and Concurrency - database programming using Servlet.

Text Book:
WEB TECHNOLOGY LAB

LIST OF EXPERIMENTS

1. Creation of HTML Files
2. Working with Client Side Scripting
   2.1 JavaScript
3. Configuration of web servers
   3.1 Apache Web Server
   3.2 Internet Information Server (IIS)
4. Experiments in Servlet
   5.1 Implementing MVC Architecture using Servlets
   5.2 Data Access Programming (using ADO)
   5.3 Session and Application objects
   5.4 File System Management
5. Write programs in Java to create three-tier applications using servlets
   • for conducting on-line examination.
   • for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
PROJECT

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

The project is of 2 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be either an individual one or a group of not more than three members and submit a project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce examinations.
DISCIPLE SPECIFIC ELECTIVE (DSE) PAPERS
SPECIALIZATION STREAM -I [SOFTWARE ENGINEERING]

Paper Code: CSIT243

OBJECT ORIENTED SYSTEM DESIGN

Prerequisite: Knowledge of object oriented programming

Objectives:
- Understand software modeling and Architectural Concepts
- Understand and apply UML notations in designing software
- Gain knowledge about Static and Dynamic modeling

MODULE - I
Introduction - overview - Object basics - Object state and properties, Behavior, Methods, Messages- Object Oriented system development life cycle - Benefits of OO Methodology. - Overview of Prominent OO Methodologies - Rumbaugh OMT-. The Booch methodology- Jacobson's OOSE methodologies- Unified Process

MODULE - II

MODULE - III
Class Modeling and Design Approaches - Three approaches for identifying classes - using Noun phrases, Abstraction, Use Case Diagram - Comparison of approaches- Using combination of approaches. - Flexibility guidelines for class diagram: Cohesion, Coupling, Forms of coupling - class Generalization, class specialization versus aggregation -Behavioral - State diagram - State Diagram states - Interaction diagrams- Sequence diagram - Sequence diagram notations - Activations in sequence diagram- Collaboration diagram - Collaboration diagram notations

MODULE - IV
Approaches for developing dynamic systems- Top-down approach for dynamic systems- Bottom-up approach for dynamic systems- Flexibility Guidelines for Behavioral Design - Architectural view- Logical architecture - Hardware architecture - deployment diagram notations, nodes, object migration between node - Process architecture - process and threads notations in UML, object synchronization, invocation schemes for threads - Implementation architecture - component diagram notations and examples.

MODULE - V
Reuse - Libraries, Frame works components and Patterns- Reuse of classes- Reuse of components- Reuse of frameworks, black box framework, white box frame- Reuse of patterns - Architectural pattern and Design pattern.
Text Books
SERVICE ORIENTED ARCHITECTURE

Prerequisite: Knowledge of Object oriented system design.

Objectives
1. Understand the concepts of Service Oriented Architecture along with the evolution of SOA.
2. Be aware of the key issues facing many organizations, especially dealing with integration among systems and providing architectural abstractions to them.
3. Integrate SOA technologies with Web Services paradigms.
4. Know related technologies and implementation basics of SOA.

MODULE - I
Fundamental SOA- Common Misperceptions about SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA. The Evolution of SOA:-from XML to Web services to SOA, Comparing SOA with N-tier architecture, The continuing evolution of SOA, The roots of SOA.

MODULE - II

MODULE - III

MODULE - IV

MODULE - V
Service-Oriented Design - Introduction to service-oriented design- WSDL-related XML Schema language basics- WSDL language basics- SOAP language basics- Service interface, design tools. SOA Composition Guidelines: Steps to composing SOA Considerations for choosing service layers and SOA standards, positioning of cores and SOA extensions.

Text Books

Reference Books
SOFTWARE TESTING

Prerequisite: Knowledge of Software Engineering.

Objectives
- To make practitioners/students to understand the state-of-practice in testing industry by learning various types of software testing.

MODULE - I
Principles of testing – Software development life cycle models – phases of software project – life cycle models - Types of Testing – white box testing – static testing – structural testing – challenges in white box testing – black box testing – how to do black box testing

MODULE - II
Integration Testing – integration testing as a type of testing – integration testing as phase of testing – scenario testing – defect bash – System & Acceptance Testing - reason for conducting system testing – functional testing and non–functional testing - acceptance testing – summary of testing phases

MODULE - III

Text Book:

Software Testing Lab:

Implement the below mentioned exercises using any Testing Tool

1. Test Principles and Concepts
2. Test Management
3. Build the Test Environment
4. Test Planning Process
5. Test Design
6. Performing Tests
7. Defect Streaming and Correction
8. Acceptance Testing
9. Status of Testing
10. Test Reporting
DISCIPLE SPECIFIC ELECTIVE (DSE) PAPERS
SPECIALIZATION STREAM -II [ADVANCED COMPUTING]

Paper Code: CSIT244

DISTRIBUTED COMPUTING

**Prerequisite:** Knowledge of Database and Networks.

**Objective**
- To make the students to understand the collaborative operations of collections of computer systems.

**MODULE I**

**MODULE II**

**MODULE III**
Remote Invocation – Introduction - Request-reply protocols - Remote procedure call - Remote method invocation. Case study: Java RMI - Group communication - Publish-subscribe systems -Message queues - Shared memory approaches -Distributed objects - Case study: CORBA -from objects to components

**MODULE IV**

**MODULE V**

**Text Book**
CLOUD COMPUTING

Prerequisite: Knowledge of Parallel and Distributing computing.

Objectives
- To impart the principles and paradigm of Cloud Computing
- To understand the Service Model with reference to Cloud Computing
- To comprehend the Cloud Computing architecture and implementation
- To realize the role of Virtualization Technologies
- To have knowledge on Cloud Computing management and security

MODULE – I

MODULE – II
Cloud Deployment Models – Introduction - Private Cloud - Public Cloud- CommModuley Cloud - Hybrid Cloud- Cloud Service Models- Infrastructure as a Service- Platform as a Service

MODULE – III

MODULE – IV
Virtualization - Approaches to Virtualization- Hypervisors - From Virtualization to Cloud Computing- Programming Models for Cloud Computing

MODULE – V
Software Development in Cloud Introduction - Different Perspectives on SaaS Development - New Challenges - Cloud-Aware Software Development Using PaaS Technology

Text Book:
SERVICES COMPUTING

Prerequisite: Knowledge of Computing and Web services.

Objectives

- To understand the advantages of using XML technology family
- To analyze the problems associated with tightly coupled distributed software architecture
- To use Web services as building block in distributed application development
- To design e-business solutions using SOA and XML based web services

MODULE – I
Web services basics – Introduction - The concept of software as a service - A more complete definition of Web services - A more complete definition of Web services - Characteristics of Web services - Service interface and implementation - The service-oriented architecture - Operations in the SOA - The Web services technology stack - Quality of service(QoS) - Web services interoperability

MODULE – II
Enabling infrastructure - Distributed computing infrastructure- Distributed computing and Internet protocols - The client–server model - Characteristics of inter process communication - Synchronous forms of middleware - Asynchronous forms of middleware - Request/reply messaging - Message-oriented middleware

MODULE – III
Brief overview of XML - XML document structure - URIs and XML namespaces - XML schemas reuse - Document navigation and transformation

MODULE – IV
Core functionality and standards - SOAP: Simple Object Access Protocol - Inter-application communication and wire protocols - SOAP as a messaging protocol - Structure of a SOAP message - The SOAP communication model - Error handling in SOAP - SOAP over HTTP - Advantages and disadvantages of SOAP

MODULE – V
Describing Web services - Why is a service description needed? - WSDL: Web Services Description Language - Using WSDL to generate client stubs - Non-functional descriptions in WSDL - Registering and discovering Web services - Registering and discovering Web services Service registries - Service discovery - UDDI: Universal Description, Discovery, and Integration

Text Book:
DISCIPLE SPECIFIC ELECTIVE (DSE) PAPERS
SPECIALIZATION STREAM -III [WIRELESS COMMUNICATION]

Paper Code: CSIT245

WIRELESS COMMUNICATION TECHNOLOGY

Prerequisite: Knowledge of Data communication and Networks.

Objectives
- To know about the various frequency Spectrum and Signals for wireless communication
- To Know the concept of Infrared, Cordless and WLL
- To understand the concepts wireless communication technologies such as Wireless LAN, WiMAX, Bluetooth and Wi-Fi

MODULE –I

MODULE –II

MODULE –III

MODULE –IV

MODULE –V

TEXT BOOKS

REFERENCES
INTRODUCTION TO MOBILE COMMUNICATION

Prerequisite: Knowledge of Data communication and Wireless Networks.

Objectives
- To understand the concepts of Telecommunication Systems such as GSM, DECT, TETRA, UMTS and UTRAN.
- To understand the Mobile Network Layer and Transport Layer.

MODULE I

MODULE II

MODULE III
Broadcast systems – Overview, Cyclical repetition of data, Digital audio broadcasting, Multi-media object transfer protocol, Digital video broadcasting, DVB data broadcasting, DVB for high-speed internet access, Convergence of broadcasting and mobile communications

MODULE IV
Mobile communications - Radio layer Baseband layer Link manager protocol L2CAP Security SDP Mobile network layer - Mobile IP, Goals, assumptions and requirements, Entities and terminology, IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimizations, Reverse tunneling, IPv6, IP micro-mobility support.

MODULE V

TEXT BOOK
   (Chapter 1, 4, 5, 6, 8.1, 9)
INTERNET OF THINGS

**Prerequisite:** Knowledge of Wireless and Mobile communication.

**Objectives**
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

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

**MODULE- 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.

**MODULE- 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

**MODULE- IV**

**MODULE- V**

**Textbook:**

**Reference Books:**
DISCIPLE SPECIFIC ELECTIVE (DSE) PAPERS
SPECIALIZATION STREAM -IV [MULTIMEDIA]

Paper Code: CSIT246

FUNDAMENTALS OF MULTIMEDIA

Prerequisite: Basic knowledge of Computers and Multimedia elements.

Objectives
1. To understand Multimedia hard ware and software
2. To understand Multimedia system architecture
3. To understand various compression techniques
4. To understand various file formats
5. To understand storage media


MODULE II – Compression and Decompression Techniques Types of Compression, Binary Image Compression Schemes, Color, gray scale, still-video image compression, Discrete Cosine Transform, Video Image compression, MPEG Coding methodology, Audio Compression, Data and File format standards- RTF, TIFF,RIFF, MIDI, JPEG, AVI, JPEG, TWAIN Architecture.


MODULE IV – STORAGE AND RETRIEVAL TECHNOLOGIES Magnetic Media Technology, RAID-Level-0 To 5, Optical Media, WORM optical drives, Hierarchical Storage Management, Cache Management for storage systems.


REFERENCES
MULTIMEDIA APPLICATIONS

Prerequisite: Knowledge of Multimedia elements and Multimedia tools.

Objectives:

- formulate a working definition of interactive multimedia
- Getting basic idea about multimedia components and development process
- Acquiring knowledge about latest multimedia tools & hardware’s
- And also getting knowledge of internal concept and research oriented ideas


Text Books:
1. MULTIMEDIA MAGIC- S. GOKUL, BPU PUBLICATIONS- 2nd Edition

Reference Books:
3. Sound & Video, Lozano. Multimedia, PHI.
4. Multimedia: Production. Planning and Delivery, Villamil & Molina, PHI
5. Multimedia on the Pc, Sinclair, BPB.
AUDIO AND VISUAL TECHNOLOGY

Prerequisite: Basic knowledge of Multimedia and Multimedia Tools.

Objectives:
- formulate a working definition of interactive multimedia
- Getting basic idea about multimedia components and development process
- Acquiring knowledge about latest multimedia tools & hardware’s


MODULE-IV: Multimedia Component Animation: Classification I: Cel animation- Object animation -Classification II: Two-dimensional animation- Three-dimensional animations- Classification III : Animation for movies- Animation for television shows- Animations for multimedia applications and games- Animations for the Internet- Classification – IV: Animation by programming -Morphing- Understanding two-dimensional animation planes- Understanding three-dimensional worlds- Animation tools- Two-dimensional animation software- Three dimensional animation software


Text Book(s):
- MULTIMEDIA MAGIC- S. GOKUL, BPB PUBLICATIONS- 2nd Edition

Reference Book(s):
3. Sound & Video, Lozano. Multimedia, PHI.
4. Multimedia: Production. Planning and Delivery, Villamil & Molina, PHI
5. Multimedia on the Pc, Sinclair, BPB.
DISCIPLE SPECIFIC ELECTIVE (DSE) PAPERS
SPECIALIZATION STREAM -V [IT MANAGEMENT]

Paper Code: CSIT247

IT INFRASTRUCTURE MANAGEMENT

Prerequisite: Knowledge of Information System.

Objectives

- To understand the IT infrastructure
- To learn current computing environment
- To learn how to manage the Information Systems

MODULE I: IT Infrastructure: Overview
Definitions, Infrastructure management activities, Evolutions of Systems since 1960s
(Mainframes-to-Midrange-to-PCs-to-Client-server computing-to-New age systems) and their
Management, growth of internet, current business demands and IT systems issues, complexity of
today’s computing environment, Total cost of complexity issues, Value of Systems management
for business.

MODULE II: IT Infrastructure Management
Factors to consider in designing IT organizations and IT infrastructure, Determining customer’s
Requirements, Identifying System Components to manage, Exist Processes, Data, applications,
Tools and their integration, Patterns for IT systems management, Introduction to the design
process for information systems, Models, Information Technology Infrastructure Library (ITIL).

MODULE III: Current computing environment
Complexity of current computing, multiple technologies, multiple vendors, multiple users, e-
Waste disposal, Total cost of ownership.

MODULE IV: IT system Management
Common tasks in IT system management, approaches for organization Management, Models in
IT system design, IT management systems context diagram, patterns for IT system Management

MODULE V: Establishing business value of information system
Information system costs and benefits, Capital budgeting for information system, Real Options
pricing models, Limitation of financial models.

TEXT BOOK:
IT PROJECT MANAGEMENT

Prerequisite: Knowledge of IT Infrastructure Management.

Objectives
1. To understand the Nature of IT projects
2. To design Project plans and write Project proposals.
3. To understand the Project Development Life Cycle.

MODULE –I
The Nature of Information Technology Projects – Conceptualizing the IT Project - Developing the Project Charter and Baseline Project Plan

MODULE –II
The Human Side of Project Management - Defining and Managing Project Scope

MODULE –III
The Work Breakdown Structure and Project Estimation - The Project Schedule and Budget - Managing Project Risk

MODULE –IV
Project Communication, Tracking and Reporting– IT Project Quality Management

MODULE –V
Managing Organizational Change, Resistance and Conflict – Project Implementation, Closure and Evaluation.

TEXT BOOK
INFORMATION SECURITY MANAGEMENT

Prerequisite: Knowledge of Mathematics, Information System.

Objectives:
- To learn about Information security
- To learn Authentication and Authorization
- To learn how to deal with Information Security Challenges
- Develop a basic understanding of cryptography, how it has evolved and some key encryption techniques used today.

MODULE- I:

MODULE- II:

MODULE- III:
System Security, Desktop & Server Security, Firewalls, Password cracking Techniques, Keylogger, viruses and worms, Malwares & Spywares, Windows Registry

MODULE- IV:

MODULE- V:
Vulnerability Assessment, Penetration Testing, Cyber Laws

Text Book:

Reference Book:
OPEN ELECTIVE - I

Paper Code: CSIT248

E-COMMERCE

Prerequisite: Knowledge of computer networks

Objectives:
- To learn both the technical and business-related implications of electronically mediated commerce.
- To learn the development of electronic business from its origins in electronic data interchange to its current growing importance.
- To learn the potential of electronic business for future development and the development of the ‘Information Society’ and ethical issues facing business organizations in their daily use of the Internet

MODULE – I
Introduction to e-commerce – benefits of e-commerce – impact of e-commerce – classification of e-commerce – Web 2.0 based social networking platform for social media e-commerce – application of e-commerce technologies

MODULE – II

MODULE – III

MODULE - IV

MODULE – V

Text Book:
OPEN ELECTIVE – II

Paper Code: CSIT249

IT ENABLED SERVICES

Prerequisite: Knowledge Information Technology

Objective:

- To understand importance of IT enabled services.
- To encourage the use of Information Technology so as to enable students to improve their skills, knowledge and job prospects and enable them to obtain employment in sunrise industries.
- To develop the ability to integrate various resources for optimization in the industry as well as for strategic utilization of IT enabled services and functions.


MODULE – V IT Enabled Web Services - Overview of basic features of PHP: arrays, functions and state management, working with PHP forms, More advanced PHP, OOP’s concept in PHP, Portable database supported with different, exception handling, concepts of UDDI, WSDL, SOAP - Current Trends in ITES - Current Employment in the IT and ITES industry: Newly emerging area and requirement of IT enabled service sector.

Text Books:
1. Sanjiva Shankar Dubey, “IT strategy and Management”, PHI.
2. K.Venkatesh, “Marketing of Information Technology”, TMH.
Reference Books:
OPEN ELECTIVE –III

Paper Code: CSIT357

TOTAL QUALITY MANAGEMENT

Prerequisite: Knowledge of E-Commerce

Objectives:
- To learn how to understand the customer’s perception and to satisfy the customer
- To understand process capability and Reliability concepts
- To learn the different quality functions and how to develop them

MODULE I

MODULE II

MODULE III

MODULE IV
Quality functions development (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ, QFD process. Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation. Seven Tools (old & new). Bench marking and POKA YOKE.

MODULE V

TEXT BOOKS

REFERENCES
OPEN ELECTIVE – IV

Paper Code: CSIT358

ARTIFICIAL INTELLIGENCE

Prerequisite: Knowledge of predicate calculus and programming

Objectives:
- To study the concepts of Artificial Intelligence and Methods of solving problems using Artificial Intelligence
- To understand the basic techniques of knowledge representation and their use and components of an intelligent agent
- To be able to implement basic decision making algorithms, including search based and problem solving techniques, and first-order logic.

MODULE - I
Introduction to AI & Production Systems - Introduction - AI problems, foundation of AI and history of AI intelligent agents - Agents and Environments - the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

MODULE - II

MODULE - III
Representation of Knowledge - Knowledge Representation & Reasons logical Agents, Knowledge – based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward Chaining

MODULE - IV
First order logic - Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution - Learning - Learning from observations – forms of learning

MODULE - V
An Overview of Prolog - An example program: defining family relations - Extending the example program by rules -A recursive rule definition - How Prolog answers questions - Declarative and procedural meaning of programs - Syntax and Meaning of Prolog Programs - Lists, Operators, Arithmetic - Using Structures: Example Programs

Text Books:
SKILL ENHANCEMENT COURSES (SEC)

Paper Code: CSIT201

SOFT SKILLS

Prerequisite: Basic knowledge of English language

Objectives:
- To enable learners to develop their communicative competence.
- To facilitate learners to improve their soft skills.
- To equip learners with employability skills to enhance their prospect of placements.

MODULE - I
Nature of technical communication: Stages of communication – Channels of communication – Nature of technical communication – Importance and need for technical communication – Technical communication skills - The Listening process: Types of listening – Listening with a purpose – Barriers to listening – The speech process – Conversion and oral skills – Body language.

MODULE - II

MODULE - III
Presentation Skills: Planning the presentation – Preparing the presentation – Organizing your presentation – Rehearsing the presentation – Improving delivery

Text Book:

SOFT SKILLS LAB – EXERCISES
1. ORAL PRESENTATION
- TV violence.
- Is the Fast-Food Industry Accountable Legally for poor health?
- Intelligence depends more on the environment than genetic factors.
- Environment vs. technology Impact of technology on learning
- Learning does not eradicate ignorance
- How WiFi improved your life?

2. GROUP DISCUSSION
- NGOs - Do they serve peoples’ interests or are they pressure groups?
- Role of women in development.
- Kids today are not what they used to be.
- Repeated elections - Should taxpayers pay for it?
- In India, the whole is less than the parts - Do we lack in team spirit?
- "Dot.com" companies - Is there room for everyone?
- Artificial Intelligence - Will man be ever replaced by machines?
3. INTERVIEW SKILLS

- How to make a good impression
- Basic Interview Questions
- Behavioural Interview Questions
OFFICE AUTOMATION TOOLS

Prerequisite: Knowledge of computers
Objectives:
- To understand how to use office automation software packages in day to day activities

MODULE – I

MODULE – II
MS Excel - Introduction and area of use -Working with MS Excel - concepts of Workbook & Worksheets - Working with Data & Ranges - Different Views of Worksheets - Column Freezing, Labels, Hiding, Splitting etc.;-Using different features with Data and Text - Use of Formulas, Calculations & Functions-Cell Formatting including Borders & Shading; Working with Different Chart Types - Printing of Workbook & Worksheets with various options.

MODULE – III
MS Access: DBMS Concept; Creating database, table, fields & its properties; Data types; Adding primary key into table; Relationship; Adding/Editing data; sorting; indexing; designing queries; using forms; Report generation.

Text Books:

LIST OF LAB EXERCISES:
1. To create a personal letter using MS-WORD
2. To create company letter head using MS-WORD
3. To create a memo using MS-WORD
4. To create a greeting card using MS-WORD
5. To create a cover page of a project report.
6. To create letter using mail merge.
7. To create a slide show regarding our college and department.
8. To create a spreadsheet for mark statement of students.
9. To create various graphs with respect to students’ academic details.
LINUX AND SHELL PROGRAMMING

OBJECTIVE:
- It aims to introduce about open source operating system as we can use Linux as Server OS or as standalone OS on our PC, Shell scripting & IPC etc.

MODULE - I
UNIX UTILITIES: Introduction to UNIX file system; vi editor; file handling utilities; security by file permissions; process utilities; disk utilities; networking commands; cp; mv; ln; rm; unlink; mkdir; rmdir; du; df; mount; umount; find; ps; who; w; finger; arp; ftp; telnet; rlogin; text processing utilities and backup utilities; detailed commands to be covered are cat; tail; head; sort; nl; uniq; ggrep; egrep; fgrep; cut; paste; join; tee; pg; comm.; cmp; diff; tr; awk; tar; cpio.

MODULE - II
PROBLEM SOVING APPROACHES IN UNIX: Using single commands; using compound commands; shell scripts; C programs; building own command library of programs; working with the Bourne shell: what is a shell; shell responsibilities; pipes and input redirection; output redirection; shell script examples.

MODULE – III
UNIX FILES: UNIX file structure; directories; files and devices; system calls; library functions; usage of open; creat; read write; close; fseek; stat; fstat; octal; umask; dup; dup2; the standard I/O (fopen; fclose; fflush; fseek; fgetc; getc; getchar; fputc; putc; putchar; fgets; gets); formatted I/O; strem errors; streams and file descriptors; file and directory maintenance (chmod; chown; unlink; link; symlink; mkdir; rmdir; chdir; getcwd).

TEXT BOOKS:

REFERENCE BOOKS:

LINUX – SHELL PROGRAMMING
1. Check whether the given number is prime or not.
2. Find the biggest of given two numbers
3. Write a program to check the given number is odd or even
4. Write a program to generate Fibonacci Series
5. Write a program to prepare a Payroll with Basic Pay, DA, Allowances, PF and Gross Pay.
6. Using Case Statement, write a program to check the files ending with vowels.
7. Write a single program to sort the names and numbers in alphabetical, ascending and Descending order.
Paper Code: CSIT401

PHP PROGRAMMING

Prerequisite: Knowledge of programming

Objectives:

- To learn the fundamentals of PHP language
- To learn how to use PHP language to create websites

MODULE – I


MODULE – II

Functions – Strings – Arrays - Multidimensional Arrays- Extracting Multiple Values - Slicing an Array - Checking Whether an Element Exists - Traversing Arrays – Sorting - Objects – Terminology - Creating an Object - Accessing Properties and Methods - Declaring a Class – Introspection

MODULE – III

Web Techniques - HTTP Basics - Server Information - Processing Forms - Setting Response Headers - Maintaining State - Databases - Using PHP to Access a Database - Relational Databases and SQL MySPLi Object Interface – SQLite

Text Book:

PHP Lab – List of Exercises

1. Create a PHP page using functions for comparing three integers and print the Largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? ( A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
   Sample string : 'The quick "n" brown fox'
   Expected Output : 'Thequick''brownfox'
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
Paper Code: CSIT402

ANDROID PROGRAMMING

Prerequisite: Basic Knowledge of programming

Objectives:
- To study about the android architecture and the tools for developing android applications.
- To create an android application
- To learn about the user interfaces used in android applications
- To learn about how to handle and share android data

MODULE - I

MODULE – II
Linking Activities Using Intents – Resolving Intent Filter Collision - Returning Results from an Intent - Passing Data Using an Intent Object - Adding Fragments Dynamically - Life Cycle of a Fragment - Interactions between Fragments

MODULE – III
Understanding the Intent Object - Using Intent Filters – Adding Categories - Displaying Notifications - Android User Interface - Understanding the Components of a Screen - Adapting to Display Orientation - Managing Changes to Screen Orientation - Utilizing the Action Bar - Creating the User Interface Programmatically - Listening for UI Notifications - Designing Your User Interface with Views - Using Basic Views - Using Picker Views - Using List Views to Display Long Lists

Text Books:

ANDROID PROGRAMMING LAB - LIST OF EXERCISES
1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi-threading
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
Paper Code: CSCS403

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ONLINE COURSE /
IN-PLANT TRAINING (2 WEEKS) /
ONE MONTH INTERNSHIP /
MINI PROJECT
GENERAL ELECTIVE –I

Paper Code: CSIT125

DISCRETE MATHEMATICS

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MODULE –I

MODULE –II

MODULE –III

MODULE –IV

MODULE –V

Text Books

2. Narsingh Deo, “Graph Theory with applications to Engineering and Computer Science”, PHI, 1997. (Unit –4, 5)
GENERAL ELECTIVE –II

Paper Code: CSIT126

PROBABILITY & STATISTICS

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MODULE - I

MODULE – II

MODULE – III
Mathematical Expectation - Definition of Mathematical Expectation - Functions of Random Variables - Theorems on Expectation - Variance & Standard Deviation - Theorems on Variance - Standardized Random Variables - Special Probability Distributions - Binomial Distribution - Normal Distribution - Poisson Distribution

MODULE – IV
STATISTICS - Sampling Theory - Population and Sample - Statistical Inference - Sampling With and Without Replacement Random Samples - Random Numbers - Population Parameters - Sample Statistics - Sampling Distributions - Sample Mean - Sampling Distribution of Means - Sampling Distribution of Proportions - Sampling Distribution of Differences and Sums - Sample Variance - Sampling Distribution of Variances - Computation of Mean, Variance, and Moments for Grouped Data

MODULE – V
Curve Fitting, Regression, Correlation - Curve Fitting – Regression - The Method of Least Squares The Least-Squares Line - The Least-Squares Line in Terms of Sample Variances and Covariance - The Least-Squares Parabola - Multiple Regression Standard Error of Estimate The Linear Correlation Coefficient Generalized Correlation Coefficient Rank Correlation

Text books:
2. S. P. Gupta, Statistical Methods, S. Chand and Sons.
GENERAL ELECTIVE –III

Paper Code: CSIT235

OPERATION RESEARCH

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Module –I
Introduction to Operations Research - Principal components of decision problems - phases of OR study.

Module –II
Linear Programming - graphical solution - simplex method including artificial variable technique - duality.

Module –III
Transportation and assignment models - Sequencing

Module –IV
Game theory - optimal solution of two-person zero-sum games - mixed strategies - graphical solution of (2 X n) and (m X 2) games - solution of (m X n) games by linear programming.

Module – V
PERT and CPM - network diagrams - determination of the floats and critical path - probability considerations in project scheduling.

Text Books

1. Treatment as in Hamdy A.Taha “Operations Research - An introduction (III edition)”, chapters 1, 2, 3 (omit 3.4), 4 (omit 4.4, 4.5), 5 (omit 5.4), 11 (omit all sections except 11.4 only), 12 (omit 12.3, 12.5).
2. R.L. Ackoff and M.W.Sasieni "Fundamentals of O.R.". (For Sequencing)
GENERAL ELECTIVE –IV

Paper Code: CSIT236

NUMERICAL METHODS

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MODULE 1 : Algebraic Equation :


MODULE 4 : Interpolation: Newton’s backward and forward Interpolation Formula, Lagrange’s Interpolation Formula.

MODULE 5 : Numerical Differentiation & Integration: Trapezoidal Rule, Simpson’s one-third rule Simpson’s three- eight rule.

Text Books:
2 Introductory methods of numerical Analysis By S.S.Sastry, Phi Learning publication, Edition Fourth , 2009
Non-Major Elective Course

Paper Code: CSIT171

FUNDAMENTALS OF INFORMATION TECHNOLOGY

Objective:
- To acquire the basic knowledge about computers

Module - I

Module - II
CPU and Memory - Secondary Story Devices - Input Devices - Output Devices.

Module - III
Introduction to Computer Software - Programming Language – Operating Systems - Introduction to Database Management System.

Module - IV
Computer Networks - WWW and Internet - Email - Web Design

Module - V

Text Book:
FUNDAMENTALS OF ‘C’ LANGUAGE

Prerequisite: Knowledge of computers
Objective:
- To learn how to solve common types of computing problems.
- To learn about data types and control structures of C
- To learn how to map problems to programming features of C.
- To learn how to write good portable C programs.

MODULE - I
Introduction to Programming - How to develop a program, Algorithms, Flow-charts, Types of Programming Languages, Compiler and Linker, Testing and Debugging a program, Documentation. Constants, Variables & Data Types - Character set, C Tokens, Identifiers and Keywords, Constants, Variables, Data types - Operators & Expressions - Managing Input & output operations

MODULE - II
Decision Making – Branching & Looping - Arrays - One dimensional array: Array Manipulation, Different operations on one dimensional arrays, two dimensional array, operations on two dimensional arrays, multi-dimensional array, dynamic arrays - Handling of Character Strings.

MODULE - III
Functions - Top down approach of problem solving, standard library functions, passing values between functions, scope rules of functions, calling convention, return type of functions, call by value and call by reference, recursive functions - Storage Classes - Scope and extent, Storage Classes in a single source file: auto, extern and static, register,

MODULE – IV
Structures and Unions - Defining a structure, Declaring Structure variables, accessing structure members, structure initialization, copying and comparing structure variables, operation on individual members, arrays of structures, arrays within structures, structures and functions, union, size of structure, bit fields.

MODULE - V
File Processing - Defining and Opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access to files, Command Line Arguments.

Text Books:
WEB DESIGNING

**Prerequisite:** Knowledge of computers and internet

**Objectives:**
- To acquire the fundamental knowledge about internet & WWW
- To learn how to develop static and dynamic web pages / websites for any organization.
- To learn how to develop animated web pages

**MODULE - I**
Internet and the World Wide Web - Internet - Introduction to internet and its applications, E-mail, telnet, FTP, e-commerce, video conferencing, e-business. Internet service providers, domain name server, internet address, World Wide Web (WWW) - World Wide Web and its evolution, uniform resource locator (URL), browsers – internet explorer, Netscape navigator, opera, Firefox, chrome, Mozilla. search engine, web saver – apache, IIS, proxy server, HTTP protocol

**MODULE – II**
HTML5 – Introduction - formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors - Style sheets, CSS formatting text using style sheets, formatting paragraphs using style sheets.

**MODULE – III**
Page layout and navigation - Creating navigational aids: planning site organization, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division based layouts.

**MODULE – IV**
Tables, Forms and Media - Creating tables: creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment

**MODULE – V**
Creating user forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page.

**Text Books:**
BASICS OF COMPUTERS & OFFICE AUTOMATION

Prerequisite: -- Nil

Objectives:

- To understand how to use software packages in day to day activities

MODULE – I

DOS: Internal & External commands; Wildcard Character; file name; Creating/Editing file; batch file - MS Windows: Windows Basic - Introduction to Windows- Using My Computer; Using Windows Explorer - Printing- Introduction to Accessories and Control Panel

MODULE – II


MODULE – III

MS Excel - Introduction and area of use -Working with MS Excel - concepts of Workbook & Worksheets - Working with Data & Ranges - Different Views of Worksheets - Column Freezing, Labels, Hiding, Splitting etc.;-Using different features with Data and Text - Use of Formulas, Calculations & Functions-Cell Formatting including Borders & Shading; Working with Different Chart Types - Printing of Workbook & Worksheets with various options.

MODULE - IV

MS PowerPoint - Introduction & area of use- Working with MS PowerPoint- Creating a New Presentation-Working with Presentation; Using Wizards- Slides & it’s different views; Inserting, Deleting and Copying of Slides - Working with Notes, Handouts, Columns & Lists- Adding Graphics, Sounds and Movies to a Slide-Working with PowerPoint Objects; Designing & Presentation of a Slide Show

MODULE – V:

MS Access: DBMS Concept; Creating database, table, fields & its properties; Data types; Adding primary key into table; Relationship; Adding/Editing data; sorting; indexing; designing queries; using forms; Report generation.

Text Books:
