

BCA COURSE STRUCTURE FOR 2017 – 2018 BATCH
(Syllabus for students admitted in the year 2017 – 2018)

Sem	Subject Code	Course	Subject Title	Hrs/Week	Credits	Int. Mark	Ext. Mark	Total
I	U15TM1L1	Tamil I/*	செய்யுள், உரைநடை, மொழிப்பயிற்சி	6	3	25	75	100
	U16EGPL1	English I	English for Communication	6	3	40	60	100
	U16CA101	Core I	Programming in C	7	6	25	75	100
	U16CA1P1	Core Prac. I	C Programming Lab	4	3	40	60	100
	U14MAZ11	Allied I	Operations Research	5	4	25	75	100
	U14VL1:1/ U14VL1:2	Val. Edu	Value Education	2	2	25	75	100
Total				30	21	165	435	600
II	U15TM2L2	Tamil II/*	செய்யுள், சிறுகதைத்திருட்டு, மொழிப்பயிற்சி	6	3	25	75	100
	U16EGPL2	English II	Language Through Literature	6	3	40	60	100
	U17CA202	Core II	Programming in C++	4	4	25	75	100
	U17CA2P2	Core Prac. II	C++ Programming Lab	3	3	40	60	100
	U14MAZ22	Allied II	Numerical Methods	5	4	25	75	100
	U14MAY23	Allied III	Probability and Statistics	4	4	25	75	100
	U15EST21	Env. Stu	Environmental Studies	2	2	25	75	100
Total				30	23	190	510	700
III	U15TM3L3	Tamil III/*	செய்யுள், நாடகம், மொழிப்பயிற்சி	6	3	25	75	100
	U16EGNL3	English III	English for Competitive ExaminationS	6	3	40	60	100
	U16CA303	Core III	Programming in JAVA	6	5	25	75	100
	U16CA3P3	Core Prac III	JAVA Programming Lab	3	5	40	60	100
	U16CA3Y4	Allied IV	Digital Computer Fundamentals	5	3	25	75	100
	U16CA3S1	SBEC I	Internet Programming	2	2	25	75	100
	U16CA3E1	NMEC I	Fundamentals of Web Design	2	2	25	75	100
Total				30	23	190	510	700
IV	U15TM4L4	Tamil IV/*	செய்யுள், நாடகம், மொழிப்பயிற்சி	6	3	25	75	100
	U16EGNL4	English IV	English through Literature	6	3	40	60	100
	U16CA404	Core IV	Database Concepts	5	4	25	75	100
	U16CA4P4	Core Prac IV	Database Concepts Lab	3	2	40	60	100
	U16CA4Y5	Allied V	Microprocessor and Microcontroller	5	3	25	75	100
	U16CA4Y6	Allied VI	Introduction to Internet of Things	3	3	25	75	100
	U16CA4E2	NMEC II	Working Principles of Internet	2	2	25	75	100
Total				30	20	190	510	700
V	U16CA505	Core V	Programming in ASP.NET with C#	6	5	25	75	100
	U16CA506	Core VI	Operating Systems	6	5	25	75	100
	U16CA507	Core VII	Fundamentals of Data Structures and Algorithms	6	5	25	75	100
	U16CA5P5	Core Prac. V	Programming in ASP.NET with C# Lab	4	4	40	60	100
	U16CA5:1	Elective I	Software Engineering	6	5	25	75	100
	U17CA5:2		Software Testing and Quality Assurance					
	U17CA5:3		Data Warehousing and Data Mining					
U16CAPS2	SBEC II	Soft Skills (Oral and Written Communication)	2	2	40	75	100	
Total				30	26	180	435	600
VI	U16CA608	Core VIII	Programming in PHP	5	5	25	75	100
	U16CA6:1	Elective II	Computer Networks	6	5	25	75	100
	U17CA6:2		Management Information System					
	U17CA6:3		Organizational Behaviour					
	U16CA6P6	Core Prac. VI	PHP Programming Lab	5	4	40	60	100
	U17CA6:4	Elective III	E-Commerce and its Applications	6	5	25	75	100
	U16CA6:5		Multimedia Systems Design					
	U16CA6:6		Cloud Computing					
	U16CA6PJ	Core Project	Project Work	6	5	40	60	100
U16CA6S3	SBEC III	Programming in Android	2	2	25	75	100	
Total				30	26	180	420	600
Extensive Activities					2			
Gender Studies					1	20	80	100
Total				180	142	1115	2900	4000

S.No.	Courses	No. of Courses
1	Tamil	4
2	English	4
3	Allied	6
1	Core Courses	8
2	Core Practicals	6
3	Elective	3
4	Non Major Elective Course	2
5	Skill Based Courses	3
6	Value Education	1
7	Core Project	1
8	Environmental Studies	1
9	Extensive Activities	1
10	Gender Studies	1
Total		41

Non Major Elective Course offered by the Department:

- a) Fundamentals of Web Design - U16CA3E1
- b) Working Principles of Internet - U16CA4E2

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Core - I: PROGRAMMING IN C

Objectives:

1. To impart programming knowledge using C language.
2. To study the various concepts of C language.

Prerequisite: International 'A' Level/ Indian Higher Secondary Mathematics

UNIT-I: 12 hrs

Fundamentals of Computers - Introduction to C: Overview of Compilers and Interpreters – Structure of a C program – **C Declarations:** Introduction – C Character Set – Delimiters – The C Keywords – Identifiers – Constants – Variables – Rules for defining variables – Data types – Declaring variables – Initializing variables – Type Conversion.

UNIT-II: 12 hrs

Operators and Expressions: Comma and Conditional Operators – Arithmetic, Relational, Logical and Bitwise Operators - **The Input and Output in C:** Formatted Functions – Unformatted Functions – Commonly Used Library Functions - **Decision Statements:** if Statement – if...else Statement – Nested if...else Statement – The Break Statement – The Continue Statement – The Goto Statement – The Switch Statement.

UNIT-III: 12 hrs

Loop Control Statements: The for Loop – Nested for Loops – The while Loop – The do...while Loop - **Arrays:** Initializing – Definition – One-Dimensional Array – Two-Dimensional Array- **Strings:** Introduction – Declaration and Initialization of String – String Standard Functions.

UNIT-IV: 12 hrs

Functions: Introduction – Definition of Function – Declaration of Function - Function Prototypes – The return Statement – Types of Functions – Call by Value and Reference - **Structure and Union:** Introduction – Features of Structures – Declaration and Initialization of Structures – Structures within Structure – typedef – Enumerated Data Types – Union.

UNIT-V: 12 hrs

Pointers: Introduction – Features of Pointers – Pointer Declaration – Pointers and Arrays – Array of Pointers – Pointers to Pointers - **Files:** Introduction – Streams and File Types – Steps for File Operations – File I/O – Other File Function.

Text Book:

1. Ashok N Kamthane, *“Programming with ANSI and Turbo C”*, Pearson Education, 2011.

References:

1. Balagurusamy E., *“Programming in ANSI C”*, TMH, 5th Edition, 2010.
2. www.c4learn.com
3. www.cprogramming.com

Core Practical - I: C PROGRAMMING LAB

Objectives:

1. To enrich the practical knowledge in C programming.
2. To create useful programs using C programming concepts.

Prerequisite: Knowledge about C programming Language.

Lab Exercises:

1. Largest of Three Numbers.
2. Largest among n Numbers.
3. Ascending and Descending Order of Numbers.
4. Simple Interest and Compound Interest.
5. Sorting of names in Alphabetical order.
6. Solution of a Quadratic Equation.
7. Matrix Operations (Addition , Subtraction & Multiplication –use functions)
8. Sum of Series using Functions
9. Addition of Two Numbers using Call by Value and Call by Reference.
10. Recursive functions:
 - a. Finding Factorials
 - b. Generating Fibonacci numbers.
11. String Manipulations without using recursive functions.
12. Palindrome using pointers.
13. Using Structures
 - a. Bank Account
 - b. Student Mark List
14. File Processing
 - a. Payroll
 - b. Mark List

Core - II: PROGRAMMING IN C++

Objectives:

1. To impart knowledge in Object Oriented Programming.
2. To learn important concepts such Pointers, Constructors and Files.

Prerequisite: Knowledge about C programming Language.

UNIT-I:

12 hrs

Introduction to C++: Evolution – Object Oriented Technology – Key Concepts – Advantages - **I/O in C++:** Streams in C++ – Formatted and Unformatted Console I/O Operations - Manipulators – Custom built I/O Objects - **C++ Declarations:** Keyword – Identifiers – Data Types in C++ - Type modifiers – Type Casting – Constants – Operators in C++.

UNIT-II:

12 hrs

Control Structure: Decision Making Statements – Looping Statements – **C++ Functions:** Parts of Functions - Passing Arguments – Returning Values – Default Arguments – Inline Function – Function Overloading – Library Functions.

UNIT-III:

12 hrs

Classes and Objects: Declaring Objects – Defining member functions - Data hiding and Encapsulation – Classes, Objects and Memory – Static Member Variable and Functions –Array of Objects - Object and Function Arguments – Friend functions – Recursive Member Function – Local Classes – Empty, Static and Const Classes – Member and Non-Member Functions –Overloading Member Functions - **Constructors and Destructors:** Characteristics – Applications – Overloading Constructors – Copy Constructors - Destructors – Calling Constructors and Destructors – Private Constructors and Destructors – Dynamic Initialization –Dynamic Operators and Constructors –Recursive Constructor-Constructor and Destructor with Static Members – **Operator Overloading:** The Keyword Operator – Overloading Unary & Binary Operators – Type Conversion – Rules for Overloading Operators.

UNIT-IV:

12 hrs

Inheritance: Access Specifiers and Simple Inheritance –Types of Inheritance –Virtual Base Classes –Object as a Class member - Abstract Classes - **Pointers and Arrays:** Pointer Declaration – Pointer to Classes and Objects- ‘this’ Pointer –Pointer to derived and base classes - Pointer to members - Accessing Private members – Arrays of classes - **Binding, Polymorphism and Virtual Functions:** Binding in C++ -Pointer to derived class Objects – Virtual Functions - Array of Pointers – Abstract Classes – Virtual Functions in Derived Classes - Constructors and Destructors in Virtual Functions.

UNIT-V:

12 hrs

Files in C++: File Stream Classes – Steps of File Operations –File Pointers and Manipulators – Sequential Read and Write Operations – Random Access Operations – Error handling Functions – Command Line arguments – **Exception Handling:** Principles –Exception Handling Mechanism –Catching Multiple Exceptions - Rethrowing and Specifying Exceptions - Exceptions in Constructors and Destructors - Controlling Uncaught Exception – Exception and Operator Overloading –Exception and Inheritance –Guidelines for Exception Handling.

Text Book:

1. Ashok N. Kamthane, “*Object Oriented Programming with ANSI and Turbo C++*”, Pearson Education Pvt. Ltd., New Delhi, 2013.

References:

1. Balagurusamy E., “*Object Oriented Programming with C++*”, 6th Edition, TMH Publishing Company Ltd., New Delhi, 2013.
2. www.tutoriwal4us.com/cpp-program

Core Practical - II: C++ PROGRAMMING LAB

Objectives:

1. To learn Object Oriented Programming concepts.
2. To implement simple applications using OOPs concepts.

Prerequisite: Knowledge about C++ programming Language.

Lab Exercises:

- 1. Default Arguments**
 - (a) Write a C++ program to find out the Sum of the given Numbers using Default Argument.
- 2. Reference Arguments**
 - (a) Write a C++ program to Swap Two Numbers using Reference Arguments.
- 3. Inline Functions**
 - (a) Write a C++ program to Add and Multiply Two integer Numbers using Inline Functions.
- 4. Function overloading**
 - (a) Write a C++ program using Function Overloading.
- 5. Class and objects**
 - (a) Create Student Mark List
 - (b) Create Employee Pay Roll
 - (c) Create Bank Account.
- 6. Friend Function**
 - (a) Write a C++ program to demonstrate the Friend Function.
- 7. Constructor & Destructor**
 - (a) Write a C++ program to initialize the Complex Number with zero, to initialize with the given values and to read the value.
- 8. Operator Overloading**
 - (a) Write a C++ program to Overload Unary Operators. (-, ++, --)
 - (b) Write a C++ Program to Add Two Complex Numbers using Binary Operators.
 - (c) Write a C++ Program to Concatenate Two Strings using Binary Operator.
 - (d) Write a C++ program to Add, Subtract Two Matrices using Operator Overloading.
- 9. Inheritance**
 - (a) Prepare Pay Roll of an Employee using Single Inheritance.
 - (b) Prepare Student Mark List using Multilevel Inheritance.
- 10. Virtual Function**
 - (a) Demonstrate the use of Virtual Function (run time polymorphism) to find the Area of the Given Object.
Base class : shape
Subclass : circle, square, rectangle, triangle.
- 11. Files**
 - (a) Write a C++ program to Read the Numbers from a file, Write the Even Numbers into "even.txt" file and Odd Numbers into "odd.txt" file.
 - (b) Write a program to create a Student Mark List using File.

Core – III: PROGRAMMING IN JAVA

Objectives:

1. To create dynamic website using Java.
2. To design simple App using Android.

Prerequisite: Basic Knowledge about C, C++ programming Languages.

UNIT-I: **12 hrs**
INTRODUCTION TO JAVA: Primaries – Control Statements. **CLASSES AND OBJECTS:** General Form of a Class – Creation of Objects –Usage of Constructors – ‘this’ Keyword- Constructor Overloading - Copy Constructors - Static Data Members - Static Methods - ‘finalize()’ Method.

UNIT-II: **12 hrs**
INHERITANCE AND POLYMORPHISM: Inheriting Variables in a Class – Inheriting Methods in a Class – Inheritance and Constructors – Abstract Classes – Final Classes - **INTERFACES AND PACKAGES:** Interfaces - Structure of an Interface – Implementation of an Interface – Interface Inheritance - Packages – Placing the Classes in a Package.

UNIT-III: **12 hrs**
EXCEPTION HANDLING: Default Exception Handling – Exception and Error Classes – Catch Block Searching Pattern – ‘Throw’ Statement – ‘Throws’ Statement – Custom Exceptions - **THREADS:** Life Cycle of a Thread – Creating and Running Threads – Methods in the Thread Class – Setting the Priority of a Thread - **APPLETS:** The Life Cycle of an Applet – The Applet Class – Development and Execution of a Simple Applet – Syntax of Applet Tag.

UNIT-IV: **12 hrs**
ABSTRACT WINDOWING TOOLKIT: Events – Listeners – Event Handling Methods – Inheritance Hierarchy of Control Classes - Windows and Frames – Menus – Dialogs – Mouse Events and their Listeners – Data Base Connectivity – JDBC-ODBC Connection.

UNIT-V: **12 hrs**
Swing: Introduction - JApplet Class - Icons - JLabel Control- JTextField Control - JButton Control - JCheckbox Control - JRadioButton Control – Menu - JSlider Control - JComboBox Ccontrol - JTabbedPane Control - JScrollPane Control – Tables.

Text Books:

1. C.MUTHU, “*Programming with JAVA*”, Vijay Nicole Imprints, Chennai, 2014.

References:

1. Balagurusamy.E, “*Programming with Java A Primer*”, Tata McGraw Hill, 5th Edition, 2015.
2. Herbert Schildt, “*JAVA 2 Complete References*”, TMH publications, 4th Edition, 2001.

Core Practical - III: JAVA PROGRAMMING LAB

Objectives:

1. To create dynamic website using Java.
2. To design simple Application using Swing.

Prerequisite: Fundamental Knowledge about Java.

Lab Exercises

1. Classes and Objects

Write a Java program to create a class named “EMP with the empname, empno, department, salary, age, sex and create objects to access and display them.

2. Method Overloading

Write a Java program to find the Area of Shapes (Square, Rectangle, Circle) using Method Overloading.

3. Inheritance

Write a Java program to perform Inheritance using the following details:

Design a mark sheet which has the following details Regno, StudName, DateOfBirth, YearofStudy, Total, Result using 2 classes as follows.

Class 1: “Student” contains Regno, StudName, DateOfBirth and YearOfStudy

Class 2: “Mark” contains Regno, subject1, subject2, subject3 and subject4.

Methods: Total () and Result () to calculate total marks and results respectively. Class 2 (Mark) inherits the class 1 (Student).

4. Packages

Create a package called Homepack. Insert two classes called Income and Expenditure in Homepack. The Expenditure class has variables to store value of food, clothing and educational expenses. The Income class has variables to store salary, allowance and rent. Create a class called Budget, which uses the class of this package to calculate the savings of the family.

5. Interfaces

Create an Interface A. This interface contains a method add (). Create a class B and implement interface A, in class B, use add () method to add two Integer values and make this method to return an Integer value. Create a class C and implement interface A, in class C, use add () method to add two Float values and make this method to return a Float value.

6. Exception Handling

(a) Create a try block that is likely to generate any 4 exceptions and then incorporate necessary catch blocks and handle them appropriately.

(b) Write a Java program to create User Defined Exception.

7. Multithreading

Write a Java program to create three Threads by extending Thread class. For thread1, set MAX_PRIORITY, for thread2, set MIN_PRIORITY and for thread3, set NORM_PRIORITY. Initially make the thread1 to sleep for 1000 ms and then make the thread1 to perform its task.

8. Applet

Write an Applet program to design a Login form using AWT controls.

9. JDBC

Write a java program to establish data base connection using JDBC and create a table, insert and select records using AWT controls.

10. Swing

Write a java program to design a Registration form using Swing controls.

Allied – IV: DIGITAL COMPUTER FUNDAMENTALS

Objectives:

1. To learn the basic operations of the computer.
2. To learn the digital circuit fundamentals, memories and equip the students with basic knowledge of digital electronics.

Prerequisite: Basic Operations on Computers/Simple Mathematical Knowledge.

UNIT-I:

10 hrs

Number Systems: Binary Arithmetic (Addition, Subtraction, Multiplication, 1's and 2's complements, 9's Complement, 10's Compliments and Subtraction using complements) – Binary Coded Decimal Number Representation. Conversions in Binary, Decimal, Octal, Hexadecimal - BCD Codes (8421 code, 2421 and 4221 codes, Excess-3 Code, Gray Code) - Binary Character Codes (ASCII & EBCDIC Codes).

UNIT-II:

10hrs

Fundamental Concepts of Boolean Algebra – Basic Laws Of Boolean Algebra – evaluation of Expressions – De Morgan's Laws - **Logic Gates and Logic Circuits:** Basic logic gates – AND, OR, NAND, NOR, XOR, XNOR - Universal Gates - Logic circuits and Logic Expressions - Karnaugh Map Simplification – Sum of Products (SOP) & Product of Sum (POS).

UNIT-III:

10 hrs

Arithmetic Circuits: Half Adder and Full adder - Four bit Binary Adder - Half Subtractor and Full subtractor - Four bit Adder/Subtractor Circuit - **Combination Circuits:** Multiplexer, De-multiplexer, Encoder and Decoder - **Flip-Flops:** SR, D, JK, T & Master Slave flops.

UNIT-IV:

10 hrs

Registers – Shift Registers – Shift Left Register – Shift Right Register – Bi-directional Shift Register - **Counters** - Ring Counter - Shift Counter/Johnson's Counter - Asynchronous Counters - Synchronous Counters - **Memories:** Memory Addressing – ROM – Types of ROMs – RAM – Types of RAMs.

UNIT-V:

10 hrs

D/A Conversion: Variable Resistor Network – Binary Ladder - D/A & A/D Conversions - D/A Converter – A/D Converter - Simultaneous Conversion – Counter Method – Continuous A/D Conversion

Text Books:

1. Thomas C. Bartee, "**Digital Computer Fundamental**", 6th Edition, Tata Mcgraw Hill, 2011.

References:

1. V. Vijayendran, "**Digital Fundamentals**", S. Viswanathan (Printers & Publishers) Pvt Ltd, 1st Edition, Reprint, 2008.
2. Albert Paul Malvino, Donald P. Leach, "**Digital Principles and Applications**", TMH Publishing Company Ltd, New Delhi, 4th Edition 1991.
3. www.tutorialspoint.com
4. www.laynetworks.com

SBEC – I: INTERNET PROGRAMMING

Objectives:

1. To learn the basic of HTML and CSS.
2. To design dynamic web sites using web designing tags.

Prerequisite: Fundamental Knowledge about any Programming Language.

UNIT-I: 5 hrs

Getting Started with HTML – Formatting Text by using Tags – using Lists and Backgrounds – Creating Hyperlinks and Anchors – Introduction to Style Sheets – Formatting Text by using Style Sheets – Formatting Paragraphs by using Style Sheets.

UNIT-II: 5 hrs

Creating Tables – Formatting Tables – Creating User Forms - **The Basics of Java Script:** Overview of Java Script – Object Oriented and Java Script – General Syntactic Characteristics – Primitives, Operations, and Expressions.

UNIT-III: 5 hrs

Screen Output and Keyboard Input – Control Statements – Object Creation and Modification
.Java Script and XHTML Documents: The Java Script Execution Environment – The Document Object Model –Element Access in Java Script.

UNIT-IV: 5 hrs

Events and Event Handling: Handling Events from Body Elements – Handling Events from Button Elements - Handling Events from Text Box and Password Elements – The DOM 2 Event Model – The Navigator Object – DOM Tree Traversal and Modification.

UNIT-V: 5 hrs

Introduction To XML: Introduction – The Syntax of XML – XML Document Structure – Document Type Definitions – Namespaces – XML Schemas – Displaying Raw XML Documents – Displaying XML Documents With CSS – XSLT Style Sheets – XML Processors.

Text Book:

1. Faithe Wempen, *“HTML5 Step by Step”*, Microsoft Press, 2011.
2. Robert W. Sebesta, *“Programming the World Wide Web”*, Pearson Education, Fourth Edition, 2009.

References:

1. Joel Sklar, *Principles of Web Design: The Web Technologies Series*, Fifth Edition, 2011.
2. www.w3schools.com

NMEC – I: FUNDAMENTALS OF WEB DESIGN

Objectives:

1. To learn about Internet and communication.
2. To provide fundamental knowledge in web page designing using HTML.

Prerequisite: Basic Knowledge about Internet and Communication.

UNIT-I: **5 hrs**
Introduction to the Internet: Computers in Business - Networking-Internet - **Internet Technologies:** Modem – Internet Addressing – Physical Connections – Telephone Lines

UNIT-II: **5 hrs**
Introduction to HTML: Designing a home page-History of HTML-HTML Generations-HTML Documents-Anchor Tag-Hyperlinks-**Designing the Body Section:** Images and Pictures

UNIT-III: **5 hrs**
List: Unordered Lists - Headings in a list – Ordered Lists-**Tables:** Table creation in HTML- Coloring Cells –**MARQUEE**

UNIT-IV: **5 hrs**
Frames: Frameset Definition - Frame Definition - Nested Framesets - **Forms:** Action Attribute- Method Attribute - Enctype Attribute-Drop Down List

UNIT-V: **5 hrs**
Audio: Audio on the web – Audio formats and browser support-**Video:** Playing videos in HTML – Problems, problems and solutions-HTML video using <embed>, <object>,<video> tags – HTML video using a Hyperlink.

Text Book:

1. C Xavier, *“World Wide Web design with HTML”*, Tata Mc-Graw Hill, 2010.

References:

1. Steven Holzner, *“HTML Black Book”*, Dreamtech Publishers, 2000.
2. Jeremy Keith, *“HTML5 for Web Designers”*, A Book Apart Jeffrey Zeldmann, 2010.

Core – IV: DATABASE CONCEPTS

Objectives:

1. To learn the basic data base services in a dynamic and flexible environment.
2. To study SQL program.

Prerequisite: Knowledge about any Programming Language.

UNIT-I: 11 hrs
Introduction to Database Systems: Basic Concepts and Definitions - Data Dictionary - Database - Database System - Data Administrator - Database Administrator - **Database System Architecture:** Three-level ANSI-SPARC Data Base Architecture - Data Independence – Mappings.

UNIT-II: 11 hrs
Relational Query Languages: Query Language – **Structured Query Language:** Advantages and Disadvantages of SQL- Basic SQL Data Structure - SQL Data Types - SQL Operators - Data Definition Language - Data Query Language - Data Manipulation Language - Data Control Language - Data Administration Statements - Transaction Control Statements.

UNIT-III: 12 hrs
Data Models: Record-Based Data Model-Object-Based Data Model-Physical Data Model-Hierarchical Data Model-Network Data Model- Relational Data Model-Object-Oriented Data Model-Comparisons between Data Model- **Entity-Relational Model:** Basic E-R Concepts – Conversion of E-R Model into Relations.

UNIT-IV: 10 hrs
Normalization: Introduction – Normalization - Normal Forms - BCNF – Multi-value Dependencies and 4NF – Join Dependencies and 5NF- **Query Processing:** Introduction – Query Processing – Syntax Analyzer – Query Decomposition.

UNIT-V: 11 hrs
Transaction Processing and Concurrency Control: Introduction - Transaction Concepts - Concurrency Control - Locking Methods for Concurrency Control – **Database Recovery System:** Database Recovery Concepts - Types of Database Failures - Types of Database Recovery.

Text Book:

1. S.K. Singh, “*Database Systems - Concepts, Design and Application*”, Pearson education, 1st edition, 2013.

References:

1. Jeffrey D. Ullman, Jennifer Widom, “*A First Course in Database Systems*”, Addison Wesley Longman pvt. Ltd., Delhi, 2001.
2. Date.C.J, “*An Introduction to Database Systems*”, 8th Edition, Pearson Education, India, 2003.

Core Practical - IV: DATABASE CONCEPTS LAB

Objectives:

1. To create programs based on important concepts on RDBMS
2. To provide complete coverage of RDBMS concepts

Prerequisite: Basic Knowledge about DBMS.

Lab Exercises:

1. Creating, Updating, and inserting into databases and simple queries.
2. Uses of Select statement for queries using
 - a. AND, OR, and NOT operators, WHERE clause
 - b. UNION, INTERSECTION, MINUS
 - c. Sorting and Grouping
3. Nested Queries using SQL
 - a. Sub Queries
 - b. Join
4. Built-in functions of SQL
5. Working with TCL Commands
6. Cursors, Triggers, Stored procedures and functions
7. Pay roll preparation
8. Mark List preparation
9. Splitting a table
10. Merging a table

Allied -V: MICROPROCESSOR AND MICROCONTROLLER

Objectives:

1. To impart knowledge about basic parts and functions of microprocessor.
2. To study basic concepts of microcontrollers.

Prerequisite: Knowledge about Digital Fundamentals, Memories and I/O Devices.

UNIT-I: 11 hrs

Introduction: Evolution of Microprocessors – Single Chip Microcomputers – CPU – Memory – Buses – **Microprocessor Architecture:** Introduction – Intel 8085 – Instruction Cycle – Timing Diagram.

UNIT-II: 11 hrs

Instruction Set of Intel 8085: Introduction - Instruction and Data Formats – Addressing Modes – Status Flags – Intel 8085 Instructions – Stack – Subroutines.

UNIT-III: 11 hrs

Assembly Language Programming: Simple Examples – Addition and Subtraction of Binary and Decimal Numbers – Complements – Shift – Masking – Finding Largest Number In An Array – Arranging a Series of Numbers – Multiplication and Division – Multi Byte Addition and Subtraction.

UNIT-IV: 11 hrs

Peripheral Devices and Their Interfacing: Address Space Partitioning – Memory and I/O Interfacing – Data Transfer Schemes – Interrupts of Intel 8085 – Interfacing Devices and I/O Devices – I/O Ports – Programmable DMA Controller – Programmable Interrupt Controller – Programmable Communication Interface – Programmable Counter / Interval Timer.

UNIT-V: 11 hrs

Microprocessor And Microcontrollers: Single chip microcomputer – Intel 8051 series of microcontrollers (registers, I/O lines, the 8051 interrupts, Boolean processor, instruction set) – Intel 8096 series of microcontrollers (CPU, RAM, serial port) – Description of 8096 Microcontrollers- Thirty two bit microcontrollers- RUP144 Microcontrollers with on Chip Communication- Embedded Processor.

Text Book:

1. Badri Ram, “*Fundamentals of Microprocessors and Microcomputers*”, Dhanapat Rai Publications, New Delhi, 6th edition, 2013.

References:

1. Ramesh S Gaonkar, “*Microprocessors Architecture, Programming and Applications with the 8085/8080*”, Penram International Publishers, India, 1997.
2. www.8085microprocessor4u.blogspot.com
3. www.8085.codeplex.com

Allied - VI: INTRODUCTION TO INTERNET OF THINGS

Objectives:

1. To understand the fundamentals of Internet of Things.
2. To apply the concept of Internet of Things in the real world scenarios

Prerequisite: Basic Knowledge about Microprocessor and embedded system.

UNIT- I:

12 Hrs

Smart Connectivity: Welcome to the Internet of Things: Welcome to the Future - What Is the Internet of Things? -What Kinds of Things Can Be Connected to the Internet of Things? - What Do All Those Connected Things Do?- When Will the Internet of Things Arrive? - How Important Is the Internet of Things? - Smart Connectivity and You **Smart Technology: How the Internet of Things Works:** Understanding the Internet of Things: The Big Picture- Building the Internet of Things - Understanding Smart Devices - Understanding Network Connections- Examining Wireless Technologies Understanding the Data - Understanding Intelligent Applications - Understanding Big Data

UNIT-II:

12 Hrs

Smart Appliances: From Remote Control Ovens to Talking Understanding Smart Appliances Today -Smarter Food Storage with Smart Refrigerators - Smarter Cooking with Smart Ovens - Smarter Cleaning with Smart Washers and Dryers- Smarter Dishwashing with Smart Dishwashers - Smart Appliances and You **Smart Homes: Tomorrowland Today:** Automating the Home - A Short History of Smart Homes - Smart Steps to a Smart Home- Simple Components for a Smart Home - Smarter Living with Smart Furniture - Smarter Environment with Smart Lighting - Smarter Views with Smart Windows -Smarter Heating and Cooling with Smart Thermostats-Smarter Protection with Smart Security Systems-Smarter Sensing with Smart Monitors

UNIT-III:

12 Hrs

Smart Clothing: Wearable Tech: Wearable Technology Today—and Tomorrow - Watching the Smartwatches - Exercising with Fitness Trackers - Understanding Fitness and Activity Trackers - Keeping Well with Wearable Healthcare Devices - Monitoring Your Family with Wearable Trackers -Recording with Wearable Cameras- Eyeing Smart Eyewear - Wearing Other Smart Clothing - Dealing with Your Personal Data. **Smart Shopping:** Eliminating the Need to Shop- Changing the Retail Environment - Smart Store Tech- Making It Easier to Pay - Deliveries by Drone - Managing Inventory Smarter - What About Your Data?

UNIT-IV:

12 Hrs

Smart Cars: Connecting on the Road: Smart Cars Today—and Tomorrow - Cars That Drive Themselves Pros and Cons of Autonomous Autos.- Navigating the Legal Landscape - Smart Cars and You . **Smart Aircraft: Invasion of the Drones** - What Drones Are—and What They Aren't - How Drones Are Used Today- The Future of Drone Aircraft -Regulating Drone Aircraft-Fly the Scary Skies: The Problems with Drones

UNIT- V:

12 Hrs

Smart Warfare: Rise of the Machines - The Past, Present, Future of Tech-Based Warfare- Smart Bombs - Smart Weapons - Robot Soldiers -Smart Strategy-Smart Combat and You **Smart Businesses: Better Working Through Technology:** Smart Offices - Smart Stores - Smart Inventory Management - **Smart World: The Global Internet of Everything:** Scaling the Internet of Things Globally- Connecting Cities, States, and Countries - The Rural Internet of Things- The Agricultural Internet of Things - The Environmental Internet of Things - Battling Climate Change - Impediments to the Global Internet of Things

Text Book:

1. Michael Miller, *“The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World”*, Que Publishing, 2015.

References:

2. Arshdeep Bahga and Vijay Madisetti, “Internet of Things, A Hands on Approach”, Universities Press, 2015.
3. www.libelium.com/top_50_iot_sensor_applications_ranking/

NMEC – II: WORKING PRINCIPLES OF INTERNET

Objectives:

1. To learn the basics of Internet.
2. To provide fundamental knowledge in web page designing using HTML.

Prerequisite: Fundamental Knowledge about Web Browsers and Web Designing.

UNIT-I:

5 hrs

Internet: The wired world of the internet – Information travels across the internet – TCP/IP – Understanding internet addresses and domains – Anatomy of web connections – Internet file types. **Internet’s Underlying Architecture:** Domain name system – Routers – The internet’s client/server architecture.

UNIT-II:

5 hrs

Connecting to the internet: Connecting your computer – Connecting to the internet from online services – ISDN – The internet/television connection – Network computers – DSL(Digital Subscriber Line). **Communicating on the internet:** E-mail – Usenet and newsgroups – Internet chat and instant messaging – Making phone calls on the internet.

UNIT-III:

5 hrs

World Wide Web: Web pages – Web browsers – Markup Languages – Hypertext – Image maps and interactive forms – Web host servers – Websites with databases. **Common Internet Tools:** Gophers – Telnet – FTP and downloading files – Searching the internet.

UNIT-IV:

5 hrs

Multimedia on the Internet: Audio on the internet – Video on the internet – Intranet and shopping on the internet.

UNIT-V:

5 hrs

Safeguarding the internet: Firewalls – Viruses – Digital certificates.

Text Book:

1. Preston Gralla, *“How the Internet works”*, 10th Edition, Que publishers, 2014.

References:

1. Raj Kamal, *“Internet and Web Technologies”*, Tata Mc Graw Hill, 2002.
2. C Xavier, *“World Wide Web design with HTML”*, Tata Mc-Graw Hill, 2008.
2. www.informatics.buzdo.com/p912-internet-principles.htm

Core – V: PROGRAMMING IN ASP.NET WITH C#

Objectives:

1. To impart knowledge in designing an interactive websites using ASP.Net.
2. To create Web based applications using ASP.Net with C#.

Prerequisite: Fundamental Knowledge about C and C++ programming Languages.

UNIT-I:

7 hrs

Introducing .NET: The Evolution of Web Development – HTML and HTML Forms, Server-Side Programming, Client-Side Programming - The .NET Framework- C#, VB, and the .NET Languages, The Common Language Runtime, The .NET Class Library. **The C# Language:** C# Language Basics – Variables and Data Types – Variable Operations – Object-Based Manipulation - Conditional Logic – Loops – Methods.

UNIT-II:

14 hrs

Types, Objects, and Namespaces: The Basics About Classes – Static Members, A Simple Class. Building a Basic Class – Creating an Object, Adding Properties, Automatic Properties, Adding a Method, Adding a Constructor, Adding an Event. Value Types and Reference Types – Understanding Namespaces and Assemblies – Advanced Class Programming. **Developing ASP.NET Applications:** The Promise of Visual Studio – Creating Websites – Designing a Web Page – The Anatomy of a Web Form – Writing Code – Visual Studio Debugging .

UNIT-III:

13 hrs

Web Form Fundamentals: The Anatomy of an ASP.NET Application – Introducing Server Controls – HTML Server Controls, Converting an HTML Page to an ASP.NET Page, View State, The HTML Control Classes, Event Handling, Error Handling. The Page Class – Application Events – ASP.NET Configuration. **Web Controls:** Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Web Page.

UNIT-IV:

13 hrs

Error Handling: Exception Handling – Handling Exceptions. **State Management:** The Problem of State – View State – Transferring Information Between Pages – Cookies – Session State – Session State Configuration – Application State. **Validation:** Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with Multiple Views.

UNIT-V:

13 hrs

ADO.NET Fundamentals: Understanding Databases – Configuring Your Database –SQL Basics – The Data Provider – Model Direct Data Access – Disconnected Data Access.**The Data Controls:** The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – The DetailsView and FormView.

Text Book:

1. Matthew MacDonald, *“Beginning ASP.NET in C# 2010”*, Apress, 2013.

References:

1. Dr.J.G.R.Sathiaseelan and N.Sasikaladevi, *“Programming with c#.net”*, Pearson Education Inc, 2009.
2. Matthew MacDonald, Adam Freeman, *“Pro ASP.NET 4 in C# 2010”*, Apress, 2010.
3. Stephen Walther, Kevin Hoffman and Nate Dudek, *“ASP.NET4 Unleashed”*, Pearson Education Inc, 2011.
4. Dean Alan Hume, *“Fast ASP.NET Websites”*, Manning Publications Co, 2013.
5. www.csharpnpoints.com
6. www.asp.net-tutorials.com

Core – VI: OPERATING SYSTEMS

Objectives:

1. To impart fundamental knowledge about operating systems.
2. To study functions of operating system.

Prerequisite: Basic Knowledge about I/O devices, Memories, Hardware and Software.

UNIT-I: 12 hrs

Introduction to Operating System: Basic Concepts and Terminology - An Operating System as Resource Manager - I/O Programming - Interrupt Programming - Machine Structure – I/O Programming - Interrupt Structure and Processing.

UNIT-II: 12 hrs

Memory Management: Single Contiguous Allocation - Partitioned Allocation – Re-locatable Partitioned Memory Management - Paged Memory Management - Demand Paged Memory Management - Segmented Memory Management - Segmented and Demand Paged Memory Management.

UNIT-III: 12 hrs

Processor Management: State Model - Job Scheduling - Process Scheduling - Multiprocessor Systems - Process Synchronization.

UNIT-IV: 12 hrs

Device Management: Techniques for Device Management - Channels and Control Units - Device Allocation Considerations - I/O Traffic Controller - I/O Scheduler - I/O Device Handlers.

UNIT-V: 12 hrs

The Unix File System: Creating Files: touch, cat – Indulging in File Play: cp, rm, mv – Listing File and Directories: ls, cat, ln, chmod – Directory Related Commands: pwd, mkdir, rmdir, cd – Miscellaneous Commands: logname, id, uname, tty, date – Essential Unix Commands: who, passwd, cal – File Related Commands: wc, sort, cut – Viewing Files: head, tail – File Compression: compress, uncompress.

Text Books:

1. Stuart E. Madnick, John J. Donovan, *“Operating Systems”*, TATA McGraw Hill Publications, 18th reprint, 2011. (Units I, II, III and IV)
2. Yashavant P.Kanetkar, *“UNIX Shell Programming”*, BPB Publications, 1st edition 2010. (Unit V)

References:

1. Abraham SilberSchatz and Peter Baer Galvin, *“Operating Systems”*, 9th Edition, Addison Wesley Longman Inc, 2012.
2. www.tutorialspoint.com/operating_system/

Core – VII: FUNDAMENTALS OF DATA STRUCTURES AND ALGORITHMS

Objectives:

1. To impart knowledge on the various representations of Data
2. To study the different algorithms involved in sorting and finding the shortest path.

Prerequisite: Knowledge about C, C++ programming Language.

UNIT-I: 7 hrs

Arrays and Sequential Representations: Ordered Lists – Stacks and Queues – Evaluation of Expressions – Multiple Stacks and Queues – Singly Linked Lists – Linked Stacks and Queues – Doubly Linked Lists and Dynamic Storage Management.

UNIT-II: 14 hrs

Trees: Binary Tree Representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals, Connected Components and Spanning Trees – **Shortest Paths:** Single Source All Destinations – Activity Networks – Topological Sort and Critical Paths.

UNIT-III: 16 hrs

Divide and Conquer: General Method – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort – **The Greedy Method:** General Method – Knapsack Problem – Job Sequencing with Deadlock – **Minimum Cost Spanning Trees:** Krushcal’s Algorithm – Optimal Storage on Tapes – Optimal Merge Patterns.

UNIT-IV: 9 hrs

Dynamic Programming: General Method – Reliability Design – All Pairs Shortest Paths – 0/1 Knapsack Problem – The Traveling Salesperson Problem.

UNIT-V: 9 hrs

Backtracking: The General Method – The 8-Queen’s Problem – Graph Coloring – Hamiltonian Cycles – Knapsack Problem.

Text Book:

1. Ellis Horowitz, Sartaj Sahni, Rajasekaran, *“Fundamentals of Computer Algorithms”*, Silicon Press, 2010.

References:

1. Anany Levitin, *“Introduction to the Design and Analysis of Algorithms”*, Pearson Education, 2nd edition, 2011.
2. Ellis Horowitz and Sartaj Sahni, *“Fundamentals of Data Structure”*, Galgotia Book House, 1978.
3. www.studytonight.com/data-structures/

Core Practical – V: PROGRAMMING IN ASP.NET WITH C# LAB

Objectives:

1. To enhance the programming skills about ASP.Net.
2. To design the dynamic and interactive websites using ASP.NET.

Prerequisite: Knowledge about ASP.Net Programming Language.

Lab Exercises:

1. Write C# windows application for currency conversion.
2. Write C# windows application for calculator with some scientific function.
3. Design website for online entrance examination registration form.
4. Create a job search portal by using web controls.
5. Design ASP.Net login page for website with Session and cookies.
6. Create the webpage to validate E-Mail registration.
7. Design a web page that makes use of Ad Rotator Control.
8. Design a web page involving Multi View Control.
9. Create a MSSQL table and execute queries to read, add, remove and modify a record from that table.
10. Design website for your College, Department.

Elective – I A: SOFTWARE ENGINEERING

Objectives:

1. To impart knowledge in the life cycle of software engineering.
2. To study about the software design.

Prerequisite: Fundamental Programming Knowledge and Software.

UNIT-I: 11 hrs

Introduction: Definitions – Size factors – Quality and Productivity Factors – Managerial Issues – **Planning a Software Project:** Introduction – Defining the Problem – Developing a Solution Strategy – Planning and Development Process – Planning and Organizational Structure – Other Planning Activities.

UNIT-II: 11 hrs

Software Cost Estimation: Cost Factors – Cost Estimation Techniques – Staffing Level Estimation – Estimating Software Maintenance Costs – Software Requirement Definition – Software Requirement Specification – Formal Specification Techniques – Languages and Processors for Requirements.

UNIT-III: 11 hrs

Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real Time and Distributed Systems – Test Plans – Milestones, Walkthroughs and Inspections – Design Guidelines.

UNIT-IV: 11 hrs

Implementation Issues: Documentation Guidelines – Data Abstraction – Exception Handling – Concurrency Mechanisms.

UNIT-V: 11 hrs

Structured Coding Techniques – Coding Style – Standards and Guidelines – **Verification and Validation Techniques:** Quality Assurance – Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification – Software Maintenance – Enhancing Maintainability During Development – Managerial Aspects – Configuration Management – Source Code Metrics – Other Maintenance Tools.

Text Book:

1. Richard Fairley, “*Software Engineering Concepts*”, TMH Publication, 2012.

References:

1. Ian Sommerville, “*Software Engineering*”, Pearson education Asia, 6th Edition, 2000.
2. www.bcanotes.com
3. www.newagepublishers.com

Elective – I B: SOFTWARE TESTING AND QUALITY ASSURANCE

Objectives:

1. To know about the physical structure of networks.
2. To know about various network communications.

Unit-1:

12 Hrs

Principles of Testing : Testing in Producing Software – Dijkstra’s Doctrine – Test the Tests First – Automation Syndrome. - **Software Development Life Cycle Models :** Phases of Software Project – Quality, Quality Assurance, and Quality control – Testing, Verification, and Validation – Process Model to Represent Different Phases – Life Cycle Models – Spiral or Iterative model – The V model – Modified V Model.

Unit-2:

12 Hrs

White Box Testing: Static Testing – Structural Testing – Challenges in White Box Testing - **Black box testing:** Why and When to Do Black Box Testing – How To Do Black Box Testing.

Unit-3:

12 Hrs

Integration Testing – Integration Testing as A Type Of Testing – Integration Testing As a Phase of Testing – Scenario Testing – Defect Bash. - **System and Acceptance Testing:** Overview of System Testing – Why System Testing? – Functional vs Non-Functional Testing – Functional System Testing – Non-Functional Testing – Acceptance Testing – Summary of Testing Phases.

Unit-4:

12 Hrs

Performance Testing : Factors Governing Performance Testing – Methodology for Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges - **Regression Testing :** What is Regression Testing – Types of Regression Testing – When to do Regression Testing – How to Do Regression Testing – Best Practices in Regression Testing.

Unit-5:

12 Hrs

Internationalization Testing – Primer on Internationalization – Test Phases for Internationalization – Enabling Testing – Locale Testing – Internationalization Validation – Fake Language Testing – Language Testing – Localization Testing – Tools Used For Internationalization – Challenges and Issues - **Adhoc Testing :** Overview – Buddy Testing – Pair Testing – Exploratory Testing – Interactive Testing – Agile and Extreme Testing – Defect Seeding – Conclusion.

Text Book:

1. Srinivasan Desikan and Goplalaswamy Ramesh – “**Software Testing – Principles and Practices**” – Pearson Education, 2010. Chapters 1 to 10

Elective – III A: DATA WAREHOUSING AND DATA MINING

Objectives:

1. To impart the Measures and Metrics for Data Mining
2. To learn various Data Mining Techniques.

Prerequisite: Knowledge about Software Engineering.

UNIT-I: 11 hrs

Introduction: Why Data Mining? – What is Data Mining? – What Kinds of Patterns can be Mined? – Which Technologies Are Used? – Which Kinds of Applications Are Targeted? – Major issues in Data Mining.

UNIT-II: 11 hrs

Data Preprocessing: Data Preprocessing: An Overview – Data Clearing – Data Integration – Data Reduction – Data Transformation and Data Discretization - **Data Warehousing and Online Analytical Processing:** Data Warehouse: Basic Concepts – Data Warehouse Modeling.

UNIT-III: 11 hrs

Data Cube and OLAP – Data Warehouse Design and Usage – Data Warehouse Implementation – Data Generalization by Attribute – Oriented Induction - **Mining Frequent Patterns, Associations, and Correlations: Basics Concepts and Methods:** Basic Concepts.

UNIT-IV: 11 hrs

Frequent Itemset Mining Methods **Classification: Basic Concepts:** Basic Concepts – Decision Tree Induction – Rule Based Classification – Lazy Learners.

UNIT-V: 11 hrs

Cluster Analysis: Basic Concepts and Methods: Cluster Analysis – Partitioning Methods – Hierarchical Methods – Density Based Methods – Grid Based Methods - **Data Mining Trends and Research Frontiers:** Data Mining Applications.

Text Book:

1. Jiawei Han and Micheline Kamber, *“Data Mining Concepts and Techniques”*, Morgan Kaufmann, Third Edition, 2012.

References:

1. Margaret H.Dunham, *“Data Mining: Introductory and Advanced Topics”*, Pearson Education, 2003.
2. Arun K.Pujari, *“Data Mining Techniques”*, University Press, 2001.

SBEC – II: SOFT SKILLS (ORAL AND WRITTEN COMMUNICATION)

Objectives:

1. To impart oral communication skills.
2. To impart written communication skills

Prerequisite: Basic knowledge about English Grammar

Exercises:

I – Oral communication skills:

- Presentation
- Debate
- Group Discussion
- Interviews

II – Written communication skills:

- Preparing presentations for new products
- Preparing CV
- Preparing minutes of meeting
- Letters to press, officials and the like

Students will practise I above during class hours. Assignments will be given from II.

Evaluation:

CIA: Performance in the class	: 10
Assignment	: 10
Test I – Oral Communication	: 10
Test II- Written Communication	: 10

	40

End Semester Examination:

Tests based on presentation / Stress Interviews / GD / Mock Interviews	: 20
Testing written communication skills	: 40

Total	60

Core – VIII: PROGRAMMING IN PHP

Objectives:

1. To create dynamic website using PHP.
2. To design simple web Application using MySQL.

Prerequisite: Basic Knowledge about C, C++ programming Languages.

UNIT-I: **12 hrs**
ESSENTIAL PHP: Creating your Development Environment- Mixing HTML and PHP – Command Line PHP - Working with Variables - Creating Constants - Understanding PHP's Internal Data Types - Operators and Flow Control.

UNIT-II: **12 hrs**
STRINGS AND ARRAYS: String Function - Modifying Data in an Array - Deleting Array Elements - Array with Loops - PHP Array Functions - Sorting Array - Splitting Array - Merging Array - **CREATING FUNCTION:** Passing Function - Passing Arrays to Function - Passing by Reference - Using Default Arguments - Passing Variable Numbers of Argument - Returning Data from Function - Nesting Functions.

UNIT-III: **12 hrs**
READING DATA IN WEB PAGES: Setting up Web Pages to communicate with PHP - Text field - Checkbox - Radio Button - Password Controls - List Boxes -Button - Hidden Control - File Upload. **PHP BROWSER HANDLING POWER:**PHP's Server Variables - HTTP Header - Getting the User's Browser Type - HTTP Header - Data Validation - Client Side Data Validation.

UNIT-IV: **12 hrs**
WORKING WITH DATABASE: Creating a MYSQL Database - Creating a New Table - Putting Data into the New Database - Accessing the Database -Update data into the Database- Insert data into the Database - Delete data from Database- Handling and Avoiding Errors.

UNIT-V: **12 hrs**
AJAX: Writing AJAX - Creating XMLHttpRequest Object - Passing Data to the server with GET AND POST - Handling XML with PHP. **PHP DATA OBJECTS:** Introduction- Using PDO: Connecting to the Database - Connection Strings - Issuing Sql Queries, Quoting Parameters and handling result sets - Using PHP Data Objects: Connection Strings - Creating the sample database - Designing our code.

Text Books:

1. Steven Holzner, *“The Complete Reference PHP”*, Tata McGraw Hill Pvt. Ltd., 2011. (UNIT I, II, III and IV)
2. Dennis Popel, *“Learning PHP Data Objects: A Beginner's Guide to PHP Data Objects, Database Connection Abstraction Library for PHP 5”*, Packt Publishing, 2009. (UNIT V)

References:

1. Leon Atkinson, *“Core PHP Programming”*, Pearson Education, 2004.
2. www.jkmaterials.yolasite.com/resources/labmanuals/BTech/WT-PHP-Record.pdf

Elective – II A: COMPUTER NETWORKS

Objectives:

1. To know about the physical structure of networks.
2. To know about various network communications.

Prerequisite: Knowledge about Internet and Communications.

UNIT-I: 12 hrs

Introduction: Data Communication Networks - Protocols and Standards - Basic Concepts – Line Configuration – Topology - Transmission Mode - Categories Of Networks - The OSI Model – Functions of the Layers.

UNIT-II: 12 hrs

Physical Layer Signals: Analog and Digital - Periodic and Aperiodic Signals - Analog Signals, Composite Signals - Digital Signals - Transmission Media – Unguided Media & Guided Media.

UNIT-III: 12 hrs

Data Link Layer: Error Detection and Correction – Types of Errors – Error Detection - Various Redundancy Checks – Checksum - Error Correction - Data Link Control – Line Discipline - Flow Control - Error Control - Data Link Protocols – Character Oriented Protocols and Bit Oriented Protocols.

UNIT-IV: 12 hrs

Network Layer: Switching – Circuit Switching, Packet Switching and Message Switching - Networking and Internetworking Devices – Repeaters – Bridges – Routers – Gateways - Routing Algorithm – Distance Vector Routing and Link State Routing - **Transport Layer:** Functions of Transport Layer.

UNIT-V: 12 hrs

Session Layer: Session and Transport interaction - Synchronization points - Session Protocol Data Unit - **Presentation Layer:** Translation - Encryption and Decryption - Authentication and Data compression – **Application Layer:** Message Handling System - File transfer - Access and Management - Virtual Terminal - Directory Services - Common Management Information Protocol.

Text Book:

1. Behrouz A. Forouzan, *“Data Communication and Networking”*, TATA McGraw-Hill Publications, 2nd Edition, 2012.

References:

1. Andrew S. Tannenbaum, *“Computer Networks”*, Pearson Education, 4th Edition, 2011.
2. William Stallings, *“Data and Computer Communications”*, 8th Edition, Pearson Education, 2011.
3. www.practicallynetworked.com/networking/lan.htm

Elective – I B: MANAGEMENT INFORMATION SYSTEM

Objectives:

1. To understand the concepts of organizational information systems.
2. To study the concepts of information systems in organization.

Prerequisite: Knowledge about Storage and Retrieval of Data.

UNIT-I: **11hrs**
Introduction to Management Information System – An Overview of MIS – Structure of MIS.

UNIT-II: **11hrs**
Survey of Information Systems Technology – H/W, S/W and Communication Technology for Information Systems –Storage and Retrieval of Data – Transaction Processing, Office Automation and Information Processing Control Functions.

UNIT-III: **11hrs**
Conceptual Foundations – The Decision Making Process – Concepts of Information – Concepts of Planning and Control – Organizational Structure and Management Concepts.

UNIT-IV: **11hrs**
Information Based Support System – Support Systems for Planning Control and Decision Making – Information System Requirements – Developing a Long Range Information System Plan – Database Requirements And User Interface Requirements.

UNIT-V: **11hrs**
Development - Implementation and Management of Information Systems Resources – Quality Assurance and Evaluation of the Information Systems.

Text Book:

1. Gordon B. Davis, Margrethe H. Olson, *“Management Information System - Conceptual Foundations, Structure and Development”*, 2nd Edition, McGraw Hill International Edition, 2010.

References:

1. G. Mardrick, Joel E. Ross, James R. Claggett, *“Information System for Modern Management”*, 3rd Edition, Prentice Hall of India, 2009.
2. Jerome Kanterr, *“Managing with Information”*, 4th Edition, Prentice Hall of India, 2009.
3. www.tutorialspoint.com/management_information_system/

Elective - I C: ORGANIZATIONAL BEHAVIOUR

Objectives:

1. To help the students to understand ethics and social responsibility.
2. To improve the understanding of individual behaviour in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality and motivational theories.

Pre-requisite: Basic understanding about one's self and society.

UNIT-I: 11 Hrs
Foundations of Individual Behaviour: Ability – Biographical Characteristics – Learning – Global Implications. **Attitudes and Job Satisfaction:** Attitudes – Job Satisfaction

UNIT-II: 12 Hrs
Personality and Values: Personality – Values – Values and Ethical Behaviour in Asian Countries. **Perception and Individual Decision Making:** What is perception? – Person Perception: Making Judgments About others – The link Between Perception and Individual Decision Making – Decision Making in Organizations

UNIT-III: 13 Hrs
Motivation Concepts: Defining Motivation – Early Theories of Motivation – Contemporary Theories of Motivation – Integrating Contemporary Theories of Motivation. **Emotions and Moods:** What are Emotions and Moods? – Emotional Labor- Affective Events Theory – Emotional Intelligence – OB Applications of Emotions and Moods

UNIT- IV: 12 Hrs
Foundations of Group Behavior: Defining and Classifying Groups – Stages of Group Development – Group Properties: Roles, Norms, Status and Cohesiveness – Group Decision Making – Group Behavior: An Asian Perspective. **Understanding Work Teams:** Types of Teams

UNIT-V: 12 Hrs
Communication: Functions of Communication – The Communication Process – Direction of Communication – Interpersonal Communication – Organizational Communication – Choice of Communication channel – Barriers to Effective Communication. **Basic Approaches to Leadership:** What is Leadership? Trait Theories – Behavioral Theories.

Text Book:

1. Stephen P. Robbins, Timothy A Judge, Seema Sanghi, "*Organizational Behaviour*", Pearson Education, 2011.

Reference Book:

1. K. Aswathappa, "*Organizational Behavior Text, Cases and Games*", Himalaya Publishing House, Mumbai, 2005.
2. www.scdlpune.com/organisational-behaviour-notes.html

Elective – II C: E-COMMERCE AND ITS APPLICATIONS

Objectives:

1. To know about the physical structure of networks.
2. To know about various network communications.

Unit-1: 12 Hrs

Welcome to Electronic Commerce: Electronic Commerce Framework-Media Convergence-Anatomy of E-Commerce Applications. **The Network Infrastructure for Electronic Commerce:** Components of the I-Way-Network Access Equipment- The Last Mile: Local Roads and Access Ramps-Global Information Distribution Networks.

Unit-2: 12 Hrs

The Internet as a Network Infrastructure: The Internet Terminology-Chronological History of the Internet- NSFNET: Architecture and Components- National Research and Education Network- Globalization of the Academic Internet.

Unit-3: 12 Hrs

Network Security and Firewalls: Client –Server Network Security-Emerging Client-Server Security Threats- Firewalls and Network Security-Data and Message Security-Challenge-Response Systems-Encrypted Documents and Electronic Mail.

Electronic Commerce and World Wide Web: Architectural Framework for Electronic Commerce-Technology Behind the Web -Security And The Web.

Unit-4: 12 Hrs

Consumer Oriented Electronic Commerce: Mercantile Process Models- Mercantile Models from the Consumers Perspective- Mercantile Models from the Merchants Perspective.

Electronic Payment Systems: Types of Electronic Payment Systems-Digital Token- Based Electronic Payment Systems-Smart Cards and Electronic Payment Systems-Credit Card –Based Electronic Payment Systems-Risk and Electronic Payment Systems-Designing Electronic Payment Systems.

Unit-5: 12 Hrs

Interorganizational Commerce and EDI: Electronic Data Interchange-EDI Applications in Business- EDI:Legal,Security and Privacy Issues-EDI and Electronic Commerce. **EDI Implementation,MIME, and Value-Added Networks:** EDI Software Implementation-EDI Envelope for Message Transport- Value-Added Networks(VANs)-Internet-Based EDI.

Text Book:

1. Dr.Ravi Kalakota & Andrew B Whinston, “**Frontiers of E-Commerce**”,Pearson Education,2004.(For Unit-1:Chapters 1,2,For Unit-2:Chapters 3, For Unit-3:Chapters 5,6,For Unit-4:Chapters 7,8,For Unit-5:Chapters 9,10)

Reference Book:

2. Kamlesh K Bajaj and Debjani Nag-“**E-Commerce- The Cutting Edge of Business**”,Tata McGraw Hill Publishing Company Ltd,IV Reprint 2000.

Elective – III B: MULTIMEDIA SYSTEMS DESIGN

Objectives:

1. To impart knowledge in graphical interfaces, multimedia applications
2. To design web based applications.

Prerequisite: Fundamental Knowledge Computer Graphics.

UNIT-I:

7 hrs

Introduction to Multimedia: CDROM and the Multimedia Highway – Use of Multimedia –Introduction to Making Multimedia – Multimedia Skills.

UNIT-II:

11 hrs

Multimedia Hardware and Software : Macintosh and Windows Production Platforms –Connections – Memory and Storage Devices – Input Devices – Output Devices – Communication Devices – Basic Software Tools – Text Editing and Word Processing Tools – Painting and Drawing Tools – 3-D Modeling and Animation Tools – Image Editing Tools – Sound Editing Tools –Animation, Video and Digital Movie Tools – Making Instant Multimedia – Multimedia Authoring Tools.

UNIT-III:

12 hrs

Multimedia Building Blocks – Text – Fonts and Faces – Using Text in Multimedia – Computers and Text – Font Editing and Design Tools – Hypermedia and Hypertext – Sound – Multimedia System Sounds – MIDI Versus Digital Audio – Digital Audio – Making MIDI Audio – Audio File Formats – Images – Making Still Images – Color – Image File Formats – Animation –Principle of Animation – Making Animations That Work – Video – How Video Works –Integrating Video standards – Integrating computers and Television – Shooting and Editing –Video – Video Tips – Recording Formats – Digital Video.

UNIT-IV:

12 hrs

Multimedia and the Internet – The Internet and How it Works – Internetworking – Connections – Internet Services – The World Wide Web and HTML – Dynamic Web Pages – Multimedia on the Web – Tools for the World Wide Web – Web Services – Web Browsers – Plug-ins and Delivery Vehicles – Designing for the World Wide Web – Working on the Web – Text for the Web – Images for the Web – Sound for the Web – Animation for the Web.

UNIT-V:

13 hrs

Assembling and Delivering a Project – Planning and Costing – Project Planning – Estimating – Designing and Producing – Content and Talent – Using Content Created by others – Using Content Created for a Project – Delivering – Testing – Preparing for Delivery – Delivering on CD – ROM – Delivering on World Wide Web.

Text Book:

1. Tay Vaughan, *“Multimedia Making It Work”*,Tata McGraw Hill Edition, 5th edition, 2010.

References:

1. James E.Shuman , *“Multimedia In Action”* , Cengage Learning Publishers, 1997.
2. John Villamil , *“Multimedia An Introduction”* , Pearson Education Ltd, 1997.
3. www.webstyleguide.com/wsg2/multimedia/applications.html

Elective – III C: CLOUD COMPUTING

Objectives:

1. To understand the basic concepts of cloud computing, cloud components, cloud architecture and services.
2. To understand the design of cloud Services.

Prerequisite: Fundamental Knowledge about operating system and distributed computing.

UNIT-I: 11 hrs
Cloud Computing Basics: Cloud Computing Overview: Disambiguation - Cloud Computing - **Cloud Components:** Infrastructure -Services **Applications:** Storage - Database Services **-Intranets and the Cloud:** Components - Hypervisor Applications - **First Movers in the Cloud:** Amazon - Google - Microsoft.

UNIT-II: 11 hrs
Your Organization and Cloud Computing: When You Can Use Cloud Computing: Scenarios: Use Cloud Computing - **Benefits:** Scalability - Simplicity - Knowledgeable Vendors - More Internal Resources - Security – **Limitations:** Your Sensitive Information -Applications Not Ready -Developing Your Own Applications **-Security Concerns:** Privacy Concerns with a Third Party - Doing Enough to Secure It -Security Benefits - **Cloud Computing with the Titans:** Google – EMC - NetApp - Microsoft - Amazon - Salesforce.com - IBM.

UNIT III: 13 hrs
The Business Case for Going to the Cloud: Cloud Computing Services - Infrastructure as a Service - Platform as a Service - Software as a Service - **How Those Applications Help Your Business:** Operational Benefits - Economic Benefits - Tips for Evaluating SaaS - Staffing Benefits - **Hardware and Infrastructure: Clients:** Mobile - Thin - Thick - **Security:** Data Leakage - Offloading Work - Logging - Forensics - Development - Auditing - **Network :** Basic Public Internet - The Accelerated Internet - Optimized Internet Overlay - Site-to-Site VPN Cloud Providers - Cloud Consumers - Pipe –Redundancy - **Services:** Identity – Integration – Mapping - Payments - Search.

UNIT- IV: 13 hrs
Cloud Storage: Overview: The Basics - Storage as a Service -Providers .- Security - Reliability - Cautions - Outages – Theft - Cloud Storage for me - **Cloud Storage Providers:** Amazon Simple Storage Service (S3) - Nirvanix – Google Bigtable Datastore – MobilMe - Live Mesh - **Software as a Service: Overview:** Advantages - Software - Considerations -Vendor Advantages - Limitations **-Driving Forces:** Popularity - Virtualization Benefits - SaaS and SOA - Economic Impact - **Company Offerings:** Intuit - Google - Microsoft – IBM.

UNIT -V: 12 hrs
Software plus Services: Overview: Pros – Cons – Vendors- **Mobile Device Integration:** Google Android - **Providers:** Adobe AIR - Apple iPhone SDK - **Developing Applications:** Google: Payment Force.com and Google - Google Gears – **Microsoft:** Live Services - Microsoft SQL Services - Microsoft .NET Services - Microsoft SharePoint Services and Dynamics CRM Services- **Migrating to the Cloud: Cloud Services for Individuals:** Available Services - Skytap Solution- **Cloud Services Aimed at the Mid-Market:** Force.com - **Enterprise-Class Cloud Offerings:** MS Exchange – Vmotion -VMware vCenter Converter- Hyper-V Live Migration

Text Book:

1. Anthony T. Velte Toby J. Velte, Robert Elsenpeter, *“Cloud Computing: A Practical Approach”*, Tata McGraw Hill, 2010.

References:

1. Barrie Sosinsky, *“Cloud Computing Bible”*, Wiley Publishing, 2011.
2. www.ibm.com/cloud-computing/

Core Practical – VI: PHP PROGRAMMING LAB

Objectives:

1. To create dynamic website using PHP.
2. To design simple web Application using MySql.

Prerequisite: Fundamental Knowledge about HTML, Java and Android programming Language.

Lab Exercises

1. Write a PHP programs to perform control and looping statements.
2. Write a PHP program to handle various String Functions.
3. Create a Home Page about your College using PHP
4. Form Validation
 - a. Write a HTML file to create a simple form with 5 input fields such as Name, Password, Email, Pincode, Phone No. and a Submit button.
 - b. Write a PHP program to demonstrate required field validations to validate that all input fields are required.
 - c. Write a PHP program to validate Name, Email and Password.
 - d. Create a form for your college library entering student details for each student in the college. Validate the form using PHP validators and display error messages.
5. Database in PHP
Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Use PHP script for programs 1 and 2.
 - a. Create a Cookie and add these four user ID's and passwords to this Cookie.
 - b. Read the User id and Passwords entered in the Login form and authenticate with the values (UserId and Passwords) available in the cookies. If he is a valid user (i.e., UserName and Password match) you should welcome him by name (UserName) else you should display "You are not an Authenticated User"
 - c. Create a table which should contain at least the following fields:
name, password, email-id, phone number (these should hold the data from the registration form).
Write a PHP program to connect to that database and extract data from the tables and display them. Experiment with various SQL queries. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page
6. Sessions Tracking and Cookies Manipulation
 - a. Write a PHP program to start a PHP Session.
 - b. Write a PHP program to destroy a PHP Session.
 - c. Create a PHP Session without cookies.
7. File Handling in PHP
 - a. Create a PHP program to demonstrate opening and closing a file
 - b. Create a PHP program to demonstrate reading a file.
 - c. Create a PHP program to demonstrate writing in a file.
8. Message Passing Mechanism between Pages

SEMESTER : VI
CODE : U16CA6PJ

HOURS/WEEK : 5
CREDITS : 5

Core Project- : PROJECT WORK

SBEC - III: PROGRAMMING IN ANDROID

Objectives:

1. To design Useful APPs using Android.
2. To create Dynamic APPs using MAppviews.

Prerequisite: Basic Knowledge about Java and .Net.

UNIT-I:

5 hrs

Getting to know Android – Android development environment – Android development environment for real applications – start up code, M J Android applications.

UNIT-II:

5 hrs

Debugging Android applications: The Tools-Eclipse Java Editor: Java Errors-The Debugger–Log cat-Android Debug Bridge-DDMS-TraceView - The ApiDemos Application: Application Setup up in the Manifest File-Finding the source to an Interesting example

UNIT-III:

5 hrs

SQLite databases and connect providers: Databases-Basic structure of the MicroJobsDatabase class–Reading Data from Database-Modifying the Database. Content Providers: Introducing Notepad-Content Providers-Consuming a Content Provider.

UNIT-IV:

5 hrs

Locating and Mapping: Location-Based Services-Mapping-The Google Maps Activity-The Map View and MapActivity-Working with MapView-Location without Maps. Building a view: Android GUI Architecture–The Model-The View-The Controller-Assembling a Graphic Interface- Wiring up the Controller: Listening to the Model-Listening for Touch Events-Listening for Key events-Alternative ways to handle events-Advanced Wiring-The Menu.

UNIT-V:

5 hrs

Drawing 2D and 3D graphics: Rolling your own widgets-Layout-Canvas Drawing-Drawables-Bitmaps.Bling: Shadows, Gradients and Filters-Animation-OpenGL Graphics.

Text Book:

1. R. Roger, J Lombardo, Z Mednieks and B. Meike, “*Android – Applications Development*”, O’Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010.

References:

1. Pradeep Kothari, “*Android Application Development (with Kitkat Support), Black Book*”, Dreamtech Press , 2014.
2. Wei-Meng Lee, “*Beginning Android 4 Application Development*”, Wiley, 2012.
3. www.androidexample.com/
4. www.java2s.com/Code/Android/CatalogAndroid.htm