

**DEPARTMENT OF INFORMATION TECHNOLOGY  
JAMAL MOHAMED COLLEGE AUTONOMOUS  
TIRUCHIRAPPALLI – 620020**



**BACHELOR OF COMPUTER APPLICATION  
SYLLABUS – 2017  
UNDER CHOICE BASED CREDIT SYSTEM**

# BCA Programme – Course Structure under CBCS

Applicable to the candidates admitted from the academic year 2017 -2018 onwards

| SEM                | COURSE CODE             | PART | COURSE                        | COURSE TITLE                       | Ins Hrs / Week | CREDIT     | MARKS |      | TOTAL       |
|--------------------|-------------------------|------|-------------------------------|------------------------------------|----------------|------------|-------|------|-------------|
|                    |                         |      |                               |                                    |                |            | CIA   | ESE  |             |
| <b>I</b>           | 17U1LT1/LA1/LF1/LH1/LU1 | I    | Language – I                  |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCN1E1                | II   | English – I                   |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCA1C1                | III  | Core – I                      | HTML Fundamentals                  | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA1C2P               |      | Core – II                     | HTML Lab                           | 3              | 2          | 20    | 80   | 100         |
|                    | 17UCA1A1                |      | Allied – I                    | Numerical and Statistical Methods  | 5              | 4          | 25    | 75   | 100         |
|                    | 17UCA1A2                |      | Allied – II                   | Entrepreneurship Development       | 3              | 2          | 25    | 75   | 100         |
|                    | 17UCN1VE                | IV   | Value Education               | Value Education                    | 2              | 2          | -     | 100  | 100         |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>21</b>  |       |      | <b>700</b>  |
| <b>II</b>          | 17U2LT2/LA2/LF2/LH2/LU2 | I    | Language – II                 |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCN2E2                | II   | English – II                  |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCA2C3                | III  | Core – III                    | Programming in C                   | 6              | 5          | 25    | 75   | 100         |
|                    | 17UCA2C4P               |      | Core – IV                     | C Programming Lab                  | 3              | 2          | 20    | 80   | 100         |
|                    | 17UCA2A3                |      | Allied – III                  | Operations Research                | 4              | 3          | 25    | 75   | 100         |
|                    | 17UCA2A4                |      | Allied –IV                    | PC Administration                  | 3              | 2          | 25    | 75   | 100         |
|                    | 17UCN2ES                | IV   | Environmental Studies         | Environmental Studies              | 2              | 2          | -     | 100  | 100         |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>20</b>  |       |      | <b>700</b>  |
| <b>III</b>         | 17U3LT3/LA3/LF3/LH3/LU3 | I    | Language– III                 |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCN3E3                | II   | English – III                 |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCA3C5                | III  | Core– V                       | Data Structures                    | 4              | 4          | 25    | 75   | 100         |
|                    | 17UCA3C6                |      | Core– VI                      | Multimedia and its Applications    | 3              | 2          | 25    | 75   | 100         |
|                    | 17UCA3A5                |      | Allied– V                     | Programming in C++                 | 4              | 3          | 25    | 75   | 100         |
|                    | 17UCA3A6P               |      | Allied–VI                     | C++Programming Lab                 | 3              | 2          | 20    | 80   | 100         |
|                    | 17UCA3N1                | IV   | Non Major Elective –I #       |                                    | 2              | 2          | -     | 100  | 100         |
|                    | 17UCN3S1                |      | Skill Based Elective – I @    | Soft Skills Development            | 2              | 2          | -     | 100  | 100         |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>21</b>  |       |      | <b>800</b>  |
| <b>IV</b>          | 17U4LT4/LA4/LF4/LH4/LU4 | I    | Language–IV                   |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCN4E4                | II   | English– IV                   |                                    | 6              | 3          | 25    | 75   | 100         |
|                    | 17UCA4C7                | III  | Core– VII                     | Java Programming                   | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA4C8P               |      | Core– VIII                    | Java Programming Lab               | 3              | 2          | 20    | 80   | 100         |
|                    | 17UCA4A7                |      | Allied– VII                   | Principles of Accountancy          | 5              | 3          | 25    | 75   | 100         |
|                    | 17UCA4A8P               |      | Allied–VIII                   | Accounting Package Lab             | 3              | 2          | 20    | 80   | 100         |
|                    | 17UCA4N2                | IV   | Non Major Elective – II #     |                                    | 2              | 2          | -     | 100  | 100         |
|                    | 17UCN4EA                |      | Extension Activities          | NCC, NSS, etc.                     | -              | 1          | -     | -    | -           |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>21</b>  |       |      | <b>700</b>  |
| <b>V</b>           | 17UCA5C9                | III  | Core – IX                     | VB .Net                            | 6              | 5          | 25    | 75   | 100         |
|                    | 17UCA5C10               |      | Core – X                      | Scripting Languages                | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA5C11T              |      | Core – XI A                   | General Aptitude                   | 3              | 3          | 10    | 40   | 50          |
|                    | 17UCA5C11P              |      | Core – XI B                   | Scripting Languages Lab            | 2              | 2          | 10    | 40   | 50          |
|                    | 17UCA5C12P1             |      | Core – XII A                  | VB .Net Lab                        | 3              | 3          | 10    | 40   | 50          |
|                    | 17UCA5C12P2             |      | Core – XII B                  | RDBMS Lab                          | 2              | 2          | 10    | 40   | 50          |
|                    | 17UCA5M1 A/B            |      | Major Based Elective –I**     |                                    | 5              | 4          | 25    | 75   | 100         |
|                    | 17UCA5S2 A/B            | IV   | Skill Based Elective– II @    |                                    | 2              | 2          |       | 100  | 100         |
|                    | 17UCA5S3 A/B P          |      | Skill Based Elective – III @  |                                    | 2              | 2          |       | 100  | 100         |
|                    | 17UCA5EC1               |      | Extra Credit – I              | Java Servlets                      | -              | 4*         | --    | 100* | 100*        |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>28</b>  |       |      | <b>700</b>  |
| <b>VI</b>          | 17UCA6C13               | III  | Core– XIII                    | Data Communications and Networking | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA6C14               |      | Core– XIV                     | Operating Systems                  | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA6C15               |      | Core – XV                     | Software Engineering               | 5              | 5          | 25    | 75   | 100         |
|                    | 17UCA6C16P              |      | Core –XVI                     | Software Development Lab           | 5              | 5          | 20    | 80   | 100         |
|                    | 17UCA6M2 A/B            |      | Major Based Elective –II **   |                                    | 5              | 4          | 25    | 75   | 100         |
|                    | 17UCA6M3 A/B P          |      | Major Based Elective – III ** |                                    | 4              | 4          | 20    | 80   | 100         |
|                    | 17UCN6GS                | V    | Gender Studies                | Gender Studies                     | 1              | 1          | -     | 100  | 100         |
|                    | 17UCA6EC2               |      | Extra Credit – II             | Open Source Computing              | -              | 4*         | --    | 100* | 100*        |
| <b>TOTAL</b>       |                         |      |                               |                                    | <b>30</b>      | <b>29</b>  |       |      | <b>700</b>  |
| <b>GRAND TOTAL</b> |                         |      |                               |                                    | <b>180</b>     | <b>140</b> |       |      | <b>4300</b> |

\* Not Considered for Grand Total and CGPA.

**\*\* MAJOR BASED ELECTIVES**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>COURSE TITLE</b>         |
|-----------------|--------------------|-----------------------------|
| V               | 17UCA5M1A          | Database Management Systems |
|                 | 17UCA5M1B          | RDBMS                       |
| VI              | 17UCA6M2A          | PHP Programming             |
|                 | 17UCA6M2B          | C# and .Net Programming     |
|                 | 17UCA6M3AP         | PHP Programming Lab         |
|                 | 17UCA6M3BP         | C# and .Net Programming Lab |

**@ SKILL BASED ELECTIVES**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>COURSE TITLE</b>   |
|-----------------|--------------------|-----------------------|
| V               | 17UCA5S2A          | Shell Programming     |
|                 | 17UCA5S2B          | Ubuntu Basics         |
|                 | 17UCA5S3AP         | Shell Programming Lab |
|                 | 17UCA5S3BP         | Ubuntu Lab            |

**# Non Major Elective Courses offered to the other Departments:**

| <b>SEMESTER</b> | <b>COURSE CODE</b> | <b>COURSE TITLE</b>       |
|-----------------|--------------------|---------------------------|
| III             | 17UCA3N1           | Office Automation         |
| IV              | 17UCA4N2           | Principles of Programming |

## SEMESTER – I: CORE – I: HTML FUNDAMENTALS

**Subject Code : 17UCA1C1**  
**Hours : 5**  
**Credits : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide basic knowledge and programming skills in HTML

### **UNIT I**

**12 Hours**

Introduction to HTML: History of HTML- HTML Documents- Anchor Tag- Hyper Links. Head and Body Sections: Header Section – Title- Prologue- Link- Colorful Web Page- Comment Lines

### **UNIT II**

**17 Hours**

Designing the Body Section: Heading Printing- Aligning the Headings- Horizontal Rule- Paragraph- Tab Settings- Images and pictures-Embedding PNG Format Images

### **UNIT III**

**17 Hours**

Ordered and Unordered list: Lists- Unordered Lists- Ordered Lists. Table Handling: Tables- Tables Creation in HTML- Width of the table and cell- Table width and Alignment of Cell elements-Colouring Cells- Column Specification

### **UNIT IV**

**17 Hours**

DHTML and Style Sheets: Defining Styles- Elements of Styles- Inline Styles- External Style Sheets- Internal Style Sheets. Frames: Frameset Definition- Frame Definition- Nested Framesets

### **UNIT V**

**12 Hours**

Forms: Action Attribute- Method Attribute- Enctype Attribute- Drop down List- Sample Forms

### **Text Book**

C. Xavier, *World Wide Web Design with HTML*, Tata McGraw-Hill Publishing, New Delhi, 2007

**UNIT I** : Chapter 4, 5

**UNIT II** : Chapter 6

**UNIT III** : Chapter 7, 8

**UNIT IV** : Chapter 9, 10

**UNIT V** : Chapter 12

### **Reference Book**

N.P. Gopalan, J. Akilandeswari, *Web Technology – A Developer’s Perspective*, Prentice Hall of India Private Ltd, New Delhi, 2007

## SEMESTER – I: CORE – II: HTML LAB

**Subject Code : 17UCA1C2P**  
**Hours : 3**  
**Credits : 2**

**Maximum Marks : 100**  
**Internal Marks : 20**  
**External Marks : 80**

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1. Develop a HTML document to basic alignments on headers and format the document using suitable tags
2. Develop a HTML document which displays your name as an <h1>heading and displays any of your friends as hot text. When you click your friend's name, it opens another page, which tells about your friends
3. Develop a HTML document describing a hill station. Assign a suitable background design, background color and text color
4. Develop a HTML document to illustrate <sub> and <sup>tag
5. Develop a HTML document to illustrate basic text formatting tags.
6. Develop a HTML document to illustrate <img>tag and perform basic picture formatting such as picture middle, top, and bottom of text
7. Develop a HTML document which displays the arts and science depart of your college and the courses offered by the department using list
8. Develop a HTML document to create table with rows and columns and split them using rows span and column span
9. Develop a HTML document that includes basic style elements
10. Develop a HTML document using frames to describe about your state. The list of districts appears in another frame. When you click district the details appears in next frame
11. Develop a HTML application form for admission to under graduate course
12. Develop a website to display resume registration form with suitable controls

## SEMESTER - I: ALLIED – I: NUMERICAL AND STATISTICAL METHODS

|                    |                   |                       |              |
|--------------------|-------------------|-----------------------|--------------|
| <b>Course Code</b> | <b>: 17UCA1A1</b> | <b>Maximum Marks</b>  | <b>: 100</b> |
| <b>Hours/week</b>  | <b>: 5</b>        | <b>Internal Marks</b> | <b>: 25</b>  |
| <b>Credit</b>      | <b>: 4</b>        | <b>External Marks</b> | <b>: 75</b>  |

**Objective** To provide basic knowledge of numerical and statistical methods

- UNIT I** **15 Hours**  
Solution of algebraic and transcendental equations- Bisection method- Method of Successive Approximation or the Iteration method, Method of False Position – Newton Raphson Method
- UNIT II** **15 Hours**  
Solution of System of Linear Equations – Gauss Elimination Method, Gauss Jordan Method, Gauss Jacobi Method– Gauss Seidel Method
- UNIT III** **15 Hours**  
Diagrammatic and Graphical Representation of Numerical Data – Formation of Frequency Distribution– Histogram, Cumulative Frequency – Polygon and Ogives – Measures of Central Tendency – Measures of Dispersion
- UNIT IV** **15 Hours**  
Theory of Probability – Definitions of Probability – Sample Space – Probability of an Event – Independence of Events – Theorems on Probability – Conditional Probability – Baye's Theorem
- UNIT V** **15 Hours**  
Correlation and Regression – Properties of Correlation and Regression Coefficients – Numerical Problems for Finding the Correlation and Regression Coefficients

### Text Books

1. Dr. M.K. Venkataraman, *Numerical Methods in Science and Engineering*, the National Publishing Company, Chennai, 2001  
**UNIT I** : Chapter 3 - Section 1 to 5  
**UNIT II** : Chapter 4 - Section: 1 & 2
2. S.C. Gupta, V.K. Kapoor, *Fundamentals of Mathematical Statistics*, Sulthan Chand & Sons, 2009  
**UNIT III** : Chapter 2 - Section: 2.1 to 2.9, 2.12 to 2.14  
**UNIT IV** : Chapter 3 - Section-3.1-3.5, 3.8-3.13, 4.2  
**UNIT V** : Chapter 10 - Section: 10.1 – 10.4.2, 10.7, Chapter 11: 11.1 – 11.2.5

### Reference Books

1. S.S. Sastry, *Introductory Methods of numerical analysis*, Prentice Hall of India Pvt. Ltd., 2004
2. S.C. Gupta, V.K. Kapoor, *Elements of Mathematical Statistics*, Sultan Chand & Sons, 2009



## SEMESTER – II: CORE - III: PROGRAMMING IN C

**Code** : 17UCA2C3  
**Hours/week** : 6  
**Credits** : 5

**Maximum Marks** : 100  
**Internal marks** : 25  
**External marks** : 75

**Objective** To learn the syntax of all the statements and to provide programming skills in C

### UNIT I

**18 Hours**

Getting Started: Getting Started with C – The First C Program – Compilation and Execution – Receiving Input – C Instructions - Control Instructions in C. The Decision Control Structure: Decisions – The *if* Statement - The *if-else* Statement – Use of Logical Operators. The Loop Control Structure: Loops – The *while* Loop – The *for* Loop - The *break* Statement - The *continue* Statement - The *do-while* Loop – The Odd Loop. #Programming Exercises in the book #

### UNIT II

**18 Hours**

The Case Control Structure: Decisions using *switch* – *switch* versus *if-else* Ladder – The *goto* Keyword. Functions & Pointers: Function – Passing values between functions – Scope Rule of Functions – Calling Conventions – Using Library Functions – One Dickey Issue – Advanced Features of Functions – Adding Functions to the Library. # Programming Exercises in the book #

### UNIT III

**18 Hours**

Data Types Revisited – Integers *long* and *short* – Integers, signed and unsigned – Chars, signed and unsigned – Floats and Doubles – Storage Classes in C. The C Preprocessor: Features of C Preprocessor – Macro Expansion – File Inclusion – Conditional Compilation - # *if* and # *elif* Directives – Miscellaneous Directives – The Build Process. # Programming Exercises in the book #

### UNIT IV

**18 Hours**

Arrays: Arrays – More on Arrays – Pointers and Arrays – Two Dimensional Arrays – Array of Pointers – Three Dimensional Array. Strings: Strings – More about Strings – Pointers and Strings – Standard Library String Functions – Two-Dimensional Array of Characters – Array of Pointers to Strings – Limitations of Array of Pointers to Strings. Structures: Structures – Array of Structures – Additional of Features of Structures – Uses of Structures. # Programming Exercises in the book #

### UNIT V

**18 Hours**

Console Input/Output: Types of I/O – Console I/O Functions. File Input/Output: Data Organization - File Operations - Counting Characters, Tabs, Spaces, - A File-Copy Program - File Opening Modes - String (Line I/O in Files - Record I/O in Files . # Programming Exercises in the book #

### Text Book

Yashavant P. Kanetkar, *Let Us C*, BPB Publications , Twelfth Edition, 2012

|                 |                              |                |                      |
|-----------------|------------------------------|----------------|----------------------|
| <b>UNIT I</b>   | : Chapters 1, 2 & 3          | <b>UNIT II</b> | : Chapters 4 & 5     |
| <b>UNIT III</b> | : Chapters 6 & 7             | <b>UNIT IV</b> | : Chapters 8, 9 & 10 |
| <b>UNIT V</b>   | : Chapters 11 & 12 (Partial) |                |                      |

### Reference Book

E. Balagurusamy, *Programming in ANSI C*, Tata McGraw-Hill Publishing Company, Fourth Edition

## SEMESTER - II: CORE - IV: C PROGRAMMING LAB

**Code** : 17UCA2C4P  
**Hours/week** : 3  
**Credits** : 2

**Maximum Marks** : 100  
**Internal Marks** : 20  
**External marks** : 80

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1. Write a Program to Calculate Area & Perimeter of a Rectangle
2. Program using different forms of If-Else statement
3. Program using While, Do-While & For Loop
4. Program using Switch
5. Program using Functions
6. To swap two Numbers Using Functions & Pointers
7. Write a program to calculate the area & perimeter of a circle using #define macro
8. Write macro definitions to test whether a character is uppercase or lowercase
9. Write a program to find the sum of Rows, Columns, and Diagonal of a matrix
10. Write a program to copy two Strings without using String Functions
11. Program to demonstrate structure
12. Write a program to copy the contents of one file into another

## SEMESTER - II: ALLIED-III: OPERATIONS RESEARCH

**Code** : 17UCA2A3  
**Hours/week** : 4  
**Credits** : 3

**Maximum Marks** : 100  
**Internal Marks** : 25  
**External marks** : 75

**Objective** To provide operations research techniques and their applications

### UNIT I

**12 Hours**

Operations Research – Nature and Features of Operations Research – Advantages and Limitations  
Operations Research - Linear Programming Problem LPP - Mathematical Formulation of the Problem  
– Graphical Solution of LPP

### UNIT II

**12Hours**

General LPP – Canonical and Standard Forms of LPP – The Computational Procedure – Simplex Method - Two Phase Simplex Method

### UNIT III

**12 Hours**

Transportation Problem – Introduction – LPP Form of Transportation Problem – Solutions of a Transportation Problem - Finding Initial BFS – North West Corner rule – Least Cost Method – Vogel's Approximation Method

### UNIT IV

**12 Hours**

Assignment Problem – Introduction – Mathematical Form of Assignment Problem – Hungarian Assignment Method Balanced Only. Sequencing Problems: Introduction – Processing of n Jobs through Two Machines – Processing of n Jobs through k Machines

### UNIT V

**12 Hours**

PERT / CPM – Basic Components – logical sequencing – Rules of Network Construction -Critical Path Analysis –Probability Considerations- in PERT

### Text Book

Kanti Swarup, P.K. Gupta and Man Mohan, *Operations Research*, Sultan Chand and Sons Publishers, New Delhi, 1992

- UNIT I** : Chapters 1 & 2, Chapter 3 (3.1 – 3.3)
- UNIT II** : Chapter 3 (3.4, 3.5), Chapter 4 (4.1, 4.3 except Big-M Method)
- UNIT III** : Chapter 10 (10.1, 10.2, 10.8, 10.9)
- UNIT IV** : Chapter 11 (11.1 – 11.3 Chapter 12 (12.1 – 12.5
- UNIT V** : Chapters 25(25.1 – 25.4, 25.6, 25.7

### Reference Book

Hamdy A. Taha, *Operations Research: An Introduction*, PHI, New Delhi, 8<sup>th</sup> Edition 2008

## SEMESTER – II: ALLIED –IV: PC ADMINISTRATION

**Course Code : 17UCA2A4**  
**Hours/Week : 3**  
**Credit : 2**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To impart basic knowledge of administrating a PC

### **UNIT I**

**9 Hours**

Basic computer system – main system unit – peripherals – printer – modem – scanner – laptop, PDA, Notebook – booting the computer - mother board – CMOS – BIOS – RAM ROM – EXPANSION SLOTS- #LATEST PROCESSORS TYPES#

### **UNIT II**

**9 Hours**

ISA, MCA, EISA, VESA, PCI, AGP, chipsets. Primary memory: RAM, ROM, ECC, DIP, SIPP, SIMM, DIMM, RIMM, DDR, XMS memory, Cache memory, shadow memory, POST, BIOS SETUP – Mother board installation

### **UNIT III**

**9 Hours**

Secondary memory – magnetic recording, HDD – features, interfacing, track – sector, installing and upgrading – CHKDSK, SCANDISK, FDISK. Keyboard organization – type – Ergonomic, Mouse, Track ball, Tablet, Digital camera- #LINUX installation #

### **UNIT IV**

**9 Hours**

CPU installation – types of latest cards and chips , SATA hard disks - latest HDD capacity, DDR/DDR2 Memory, DMM, RAID, latest memory cards, DVD, Power supply - installation , Pen drive, Extension cards – Video, Audio

### **UNIT V**

**9 Hours**

PRINTERS – Types, setting up, sharing, trouble shooting, Networking – components, Ethernet, UTP cable. Internet, protocols, browsing, internet connection, installing computers – windows setup

# ..... # **Self-study portion**

### **Text Book**

Manaharlotia, *Modern Computer Hardware Course*, BPB Publications, Third Edition, 2010

**UNIT I** : Chapters 1, Chapter 2  
**UNIT II** : Chapter 4, Chapter 5, Chapter 6  
**UNIT III** : Chapter 7, Chapter 8, Chapter 9, Chapter 10  
**UNIT IV** : Chapter 23 – 27  
**UNIT V** : Chapter 12 – 15

### **Reference Book**

K.L.James, *Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance*, 2013

## SEMESTER – III: CORE - V: DATA STRUCTURES

**Code** : 17UCA3C5  
**Hours/week** : 4  
**Credits** : 4

**Maximum Marks** : 100  
**Internal Marks** : 25  
**External Mark** : 75

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**Objective** To understand the concepts of data structures

### UNIT I

**12 Hours**

INTRODUCTION TO DATA STRUCTURES: Overview – The Need for Data Structures - Definitions – Data Structures. ARRAYS: Overview – Introduction – Range of an Array – Primitive operations – Element Access in an Array – One-dimensional Array - Two-dimensional Array Multidimensional Arrays. LINKED LISTS - Overview – Introduction – Memory Allocation – Benefits – Limitations – Types – Basic Operations – Singly Linked Lists – Simple Algorithms on Linked Lists - Circular Linked Lists - Doubly Linked Lists

### UNIT II

**12 Hours**

STACKS, QUEUES AND RECURSION: Introduction – Stacks – Array and Linked Representations of Stacks – Arithmetic Expressions; Polish Notation – Recursion: Towers of Hanoi – Queues: Array representation of Queue - Linked representation of Queues – Deques

### UNIT III

**12 Hours**

TREES: Introduction – Binary Trees– Representing Binary Tress in Memory – Traversing Binary Trees - Traversal Algorithms using Stacks – Header Nodes - Binary Search Trees – Searching and Inserting in Binary Search Trees – Deleting in a Binary Search Tree - Heap Sort

### UNIT IV

**12 Hours**

GRAPHS AND THEIR APPLICATIONS: Sequential Representation of Graphs – Warshall’s Algorithm – Linked Representation of a Graph – Operations on Graphs – Traversing a Graph – Topological Sorting

### UNIT V

**12 Hours**

SORTING AND SEARCHING: Introduction – Insertion Sort – Selection Sort – Merging – Merge Sort – Radix Sort – Quick Sort - Searching and Data Modification – Hashing

### Text Books

1. A. Chitra and P.T. Rajan, *Data Structures*, Tata McGraw – Hill Publishing Company Limited, New Delhi

**UNIT I** : Chapters 1, 3 and 4

2. Seymour Lipschutz, *Data Structures*, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2006

**UNIT II** : Chapter 6      **UNIT III** : Chapter7 (7.1 – 7.9)

**UNIT IV** : Chapter 8      **UNIT V** : Chapter 9

### Reference Book

Jean Paul Tremblay and Paul G. Sorenson, *An Introduction To Data Structures with Applications*, Tata McGraw-Hill, Second Edition

## SEMESTER – III: CORE – VI: MULTIMEDIA AND ITS APPLICATIONS

**Course Code : 17UCA3C6**  
**Hours/week : 3**  
**Credit : 2**

**Maximum Marks :100**  
**Internal Marks : 25**  
**External Mark : 75**

**Objective** To provide various concepts of multimedia and its applications

### UNIT I

**9 Hours**

Introduction: Brief history of Multimedia – What is Multimedia? The Multimedia Market – Resources for Multimedia developers – Types of Products. Hardware, Operating Systems and software – Multimedia computer Architecture

### UNIT II

**9 Hours**

Text: Elements of Text – Text data files – Using text in Multimedia applications-Graphics: Elements of Graphics – Images and color – Graphics file and application formats – Obtaining images for Multimedia use – Using graphics in Multimedia applications

### UNIT III

**9 Hours**

Images: Making Still Images - Image File Format-Sound: Power of Sound – Digital Audio – MIDI Audio – MIDI vs Digital Audio –Audio file format. # Adding sound to your project#

### UNIT IV

**9 Hours**

Animation: Principles – Animating by computer - Making Animations That Work -Video: Using video – Digital Video Containers – obtaining video clips

### UNIT V

**9 Hours**

Making Multimedia: The stages of a multimedia project – What you need – Intangibles, Hardware, Software. Multimedia Skills: The Team. # What you need – Authoring Systems#

# ..... # **Self-study Portion**

### Text Book

1. David Hillman, *Multimedia Technology and Applications*, Galgotia Publications

**UNIT I** : Chapter 1, 2, 3

**UNIT II** : Chapter 4, 5

2. Tay Vaughan, *Multimedia Making it Work*, Tata McGraw – Hill Edition, Eighth Edition, 2011

**UNIT III** : Chapter 3, 4

**UNIT IV** : Chapter 5, 6

**UNIT V** : Chapter 7, 8

### Reference Book

V.K. Jain, *Introduction to Multimedia and its applications*, Khanna Publishing, 2012

## SEMESTER - III: ALLIED – V: PROGRAMMING IN C++

**Course Code : 17UCA3A5**  
**Hours/week : 4**  
**Credit : 3**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Mark : 75**

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**Objective** To give the concepts of Object Oriented Programming, the syntax of statements in C++ language and to impart the programming skills in C++

### UNIT I

**12 Hours**

Object Oriented Programming concepts: Basic concepts of OOPS-Structure of C++ Program- Tokens- Keywords-Identifiers-constants-Basic data types-User defined data types-Derived data types- Declaration of variables-Reference variables-Manipulators- Operator in C++ - Scope Resolution Operator-Type cast Operator-Expression and its types-#control structures#

### UNIT II

**12 Hours**

Functions: Main Function-Call by reference-Inline function-Function overloading-Default arguments- Math Library functions-Classes and Objects:-Specifying the class –Defining Member Function –A C++ Program with class-Nesting of Member Function-Arrays within a class-Static data members and Static member functions-#Friend Function# -Returning Object

### UNIT III

**12 Hours**

Constructor and Destructor: Constructors-Parameterized constructor-Multiple constructor in a class-Dynamic initialization of the objects-Copy constructor-Dynamic constructor-Destructor. Operator Overloading and Type conversion: Defining operator overloading-Overloading unary operator- #Type conversion#

### UNIT IV

**12 Hours**

Inheritance: Introduction-Single Inheritance-Multilevel inheritance-Multiple inheritance-Virtual base classes. Polymorphism: Pointers-Pointer to objects-this pointer-Pointer to derived classes-#Virtual Functions#

### UNIT V

**12 Hours**

Working with Files: Introduction-Classes for File stream- Opening and closing the file- Detecting end of file-File modes. Templates: Introduction- Class templates-Class templates with multiple parameters-Function templates

**# ..... # Self-study portion**

### TextBook

E.Balagurusamy, *Object Oriented Programming with C++*, [Fourth Edition], Tata McGraw Hill Publications, 2008

**UNIT I** : 1.5, 2.6, 3.2 – 3.7, 3.10, 3.17, 3.13, 3.14, 3.18, 3.24

**UNIT II** : 4.2, 4.4, 4.6, 4.7, 4.9, 4.11, 5.3 - 5.7, 5.9, 5.11, 5.12, 5.15 – 5.16

**UNIT III** : 6.2, 6.3 – 6.8, 7.1 – 7.3

**UNIT IV** : 8.1, 8.3, 8.5 – 8.7, 9.1 – 9.6

**UNIT V** : 11.1 – 11.5, 12.1 – 12.4, 12.7

### Reference Book

Herbert Schildt, *Teach yourself C++*, Third Edition, Tata McGraw-Hill Publications, 2008

### SEMESTER - III: ALLIED – VI: C++PROGRAMMING LAB

**Course Code : 17UCA3A6P**

**Hours/week : 3**

**Credit : 2**

**Maximum Marks : 100**

**Internal Marks : 20**

**External Mark : 80**

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1. Program to calculate the area and perimeter of any two basic shapes
2. Program using different forms of If-Else statement
3. Program using While, Do-While & For Loop
4. Program to illustrate Function Overloading
5. Develop a Program to print your personal details such as name, Roll no, Gender M/F, Marks for five subjects, Total, Result (Pass/Reappear by taking input from the user and display the same using two member functions
6. Program to illustrate Friend function
7. Program to illustrate class with constructors
8. Program to illustrate Operator Overloading
9. Program to implement the concept of Single level inheritance
10. Program to implement the concept of Multi level inheritance
11. Program to merge the contents of two files
12. Program to illustrate Function Templates

## SEMESTER – III: NON – MAJOR ELECTIVE-I: OFFICE AUTOMATION

**Code** : 17UCA3N1  
**Hours/week** : 2  
**Credits** : 2

**Maximum Marks** : 100  
**Internal Marks** : --  
**External Mark** : 100

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**Objective** To understand the basic concepts of MS-Word, MS-Excel, MS-PowerPoint and MS-Access

### UNIT I

**6 Hours**

Introduction- introduction to computers: What is computer-What's so special about computer- History of Computers: Evolution – the first computer-Next Generations- Basic Anatomy of Computers: The Basic Components – Functioning of the Components

### UNIT II

**6 Hours**

MS-WORD -Starting Word - Creating document - Parts of Word window- Mouse and Keyboard Operations – The Most important Keys – Formatting Features –Menus – Toolbars and their Icons  
- Word formatting Toolbar

### UNIT III

**6 Hours**

MS-EXCEL - Excel Basics: Introduction: Navigating- Selecting cells- Selecting cells with mouse- Entering and editing text-Entering numbers Entering Formulas-Entering dates-Alignment – Menus – Toolbars

### UNIT IV

**6 Hours**

MS-POWERPOINT –Navigating in PowerPoint: Creating a new Presentation - Opening a Presentation – Creating a New Slide- Saving and Closing a Presentation - Working with PowerPoint: Inserting Picture – Inserting Text – Design Template –Saving the Presentation

### UNIT V

**6 Hours**

MS-Access: Introduction: What is Database – Parts of an Access Window – Starting MS-Access – Creating a New Database – Creating a database through table Wizard - Creating a new table – Rename Columns-Saving the Database- Relationships – Creating table through Design View

### Text Book

Sanjay Saxena, *MS Office 2000 for Everyone*, Vikas Publishing, 2001

### Reference Book

Archana Kumar, *Computer Basics with Office Automation*, First Edition, 2010

## SEMESTER – IV: CORE-VII: JAVA PROGRAMMING

**Subject Code : 17UCA4C7**  
**Hours : 5**  
**Credits : 5**

**Max. Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To understand the basic concepts of Object Oriented Programming with Java language

### UNIT I

**15 Hours**

Introduction to Java Programming: Introduction – Features of Java – Applications and Applets – Java Developer Kit. Java Language Fundamentals: The Building Blocks of Java – Data Types – Variable Declarations: Declaring, Initializing and Variables – Variable Types in Java. Wrapper Classes – Operators – Control Structures – Arrays – # Strings #

### UNIT II

**15 Hours**

Java as an OOP Language – Defining Classes – Defining Methods – Knowing This – Passing Arguments to Methods – Overloading Methods – Constructor Methods – Inheritance– Overriding Methods – Modifiers: The Four Ps of Protection – Finalizing Classes, Methods and Variables – Abstract Classes and Methods – Packages – Interfaces

### UNIT III

**15 Hours**

Exception Handling: Introduction – Basics of Exception Handling in Java – Exception Hierarchy – Constructors and Methods in Throwable Class – Handling Exceptions in Java – Throwing User Defined Exceptions. Multithreading – Overview of Threads – Creating Threads – Thread Life – cycle – # Thread Priorities and Thread Scheduling #

### UNIT IV

**15 Hours**

Files and I/O Streams: Java I/O – File Streams – FileInputStream and FileOutputStream – Filter Streams – RandomAccessFile – Serialization. Applets: Introduction – Java Applications Versus Java Applets – Applet Life Cycle – Working with applets – The HTML APPLET Tag

### UNIT V

**15 Hours**

The Abstract Window Toolkit: Basic Classes in AWT – Drawing with Graphics class - Class Hierarchy in AWT – Event Handling – AWT Controls – # Layout Managers #

# ..... # **Self-study portion**

### Text Book

P. Radha Krishna, *Object Oriented Programming through JAVA*, Universities Press, 2007

|                 |                 |                |                 |
|-----------------|-----------------|----------------|-----------------|
| <b>UNIT I</b>   | : Chapter 1 & 2 | <b>UNIT II</b> | : Chapter 3     |
| <b>UNIT III</b> | : Chapter 5 & 6 | <b>UNIT IV</b> | : Chapter 7 & 8 |
| <b>UNIT V</b>   | : Chapter 10    |                |                 |

### Reference Book

Herbert Schildt, *The Complete Reference Java*, Fifth Edition, Tata McGraw-Hill, 2008

## SEMESTER – IV: CORE-VIII: JAVA PROGRAMMING LAB

**Subject Code : 17UCA4C8P**

**Hours : 3**

**Credits : 2**

**Maximum Marks : 100**

**Internal Marks : 20**

**External Marks : 80**

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1. Simple Programs using Control Statements
  - a) If statement
  - b) while loop
  - c) for loop
  - d) switch statement
2. Program to arrange the alphabetical order of given names using string handling functions
3. Program to demonstrate the class and objects
4. Program to demonstrate the following inheritance
  - a) Single Inheritance
  - b) Multilevel inheritance
5. Program to demonstrate the concepts
  - a) Interface
  - b) Abstract Class
6. Program to calculate EB-Bill preparation using package
7. Program to demonstrate multiple catch clauses
8. Program to create a Thread using the following
  - a) Extends Thread Class
  - b) Implements Runnable interface
9. Program to demonstrate various I/O Streams
  - a) To find the properties of a given directory or file
  - b) To copy a file into another.
10. Program to display geometrical objects using Applet
11. Program to create a simple calculator using AWT controls
12. Program to demonstrate the layout managers
  - a) BorderLayout
  - b) FlowLayout
  - c) GridLayout

## SEMESTER - IV: ALLIED-VII: PRINCIPLES OF ACCOUNTANCY

**Course Code : 17UCA4A7**  
**Hours/week : 5**  
**Credit : 3**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Mark : 75**

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**Objective** To provide the basic knowledge of the financial accounting

**UNIT I** **15 Hours**  
Meaning of Accounting – Meaning and Objects of Book Keeping – Accounting Concepts and Conventions – #Principles of Double Entry# – Kinds of Account – Journal and Ledger accounts

**UNIT II** **15 Hours**  
Subsidiary Books – Purchase Book, Sales Book, Purchase Returns Book, Bills Receivable Book, Bills Payable Book, Cash Book, Analytical Petty Cash Book and Journal Proper –Bank Reconciliation Statement

**UNIT III** **15 Hours**  
Trail Balance –# Preparation# – Errors Disclosed and Errors Not Disclosed by its Suspense account – Rectification of Errors

**UNIT IV** **15 Hours**  
Preparation of Final Accounts – Trading Account, Profit and Loss Account, Balance Sheet – Adjusting and Closing Entries. Methods of Depreciation Fixed Percentage on Original Cost Method and Diminishing Balance Method Only

**UNIT-V** **15 Hours**  
Bills of Exchange – #Bill Transaction, Discounting Endorsement# – Sending Bill for Collection, Noting of a Bill, Renewal of a Bill – Insolvency of Acceptor 80% - Problems 20% - Theory  
# ..... # Self-study portion.

### **Text Book**

N. Vinayakam, P.L. Mani, K.L. Nagarajan, *Principles of Accountancy*, EURASIA Publishing House PVT) Ltd., Ne w Delhi, Revised Edition, 2002

**UNIT I** : Chapter 1 & 2  
**UNIT II** : Chapter 3 & 7  
**UNIT III** : Chapter 4  
**UNIT IV** : Chapter 6  
**UNIT V** : Chapter 8

### **Reference Book**

M.C. Shukla, T.S. Grewal, *Advanced Accounts*, Eleventh Edition, S. Chand& Company Pvt Ltd, Reprinted, 1988

## SEMESTER – IV: ALLIED–VIII: ACCOUNTING PACKAGE LAB

**Course Code : 17UCA4A8P**  
**Hours/week : 3**  
**Credit : 2**

**Maximum Marks : 100**  
**Internal Marks : 20**  
**External Mark : 80**

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1. Architecture and customization of Tally
2. Configuration of Tally
3. Tally Screens and Menus
4. Creation of new company and groups
5. Preparation of voucher entries
  - a.Payment voucher
  - b.Receipt voucher
  - c.Sales voucher
  - d.Purchase voucher
  - e.Contra voucher
  - f.Journal voucher
6. Ledger Creation
7. Preparation of Trail balance
8. Preparation of Profit and loss statement.
9. Preparation of Balance Sheet
10. Preparation of Bank Reconciliation Statement
11. Creation of inventory reports
  - a. Stock groups
  - b. Stock items
  - c. Unit measurement
  - d. single and multiple Godown

## SEMESTER – IV: NON MAJOR ELECTIVE – II: PRINCIPLES OF PROGRAMMING

**Course Code** : 17UCA4N2  
**Hours/week** : 2  
**Credit** : 2

**Maximum Marks** : 100  
**Internal Marks** : --  
**External Mark** : 100

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**Objective** To impart the principles of programming and to provide programming skills in C

### UNIT I

**6 Hours**

**Introducing C:** The C programming language - Adding comments. Storing data: Creating variables - Displaying and inputting variable values - Formatting output

### UNIT II

**6 Hours**

**Constant value:** Declaring constants-Defining constants-Arrays.

### UNIT III

**6 Hours**

**Operations:** Arithmetical operators - Logical operators - Assignment operators-Comparison operators - Conditional operator

### UNIT IV

**6 Hours**

**Making statements:** Conditional if statement – if-else statement – switch statement- For loop – While loop – Do-while loop

### UNIT V

**6 Hours**

**Using functions:** Function declaration – Function arguments – Calling other functions – Recursive functions

### Text Book

Mike McGrath, *C PROGRAMMING in easy steps*, Dreamtech Press, 2006

### Reference Book

Yashavant P.Kanetkar, *Let Us C*, BPB Publications, Twelfth Edition, 2012

## SEMESTER – V: CORE – IX: VB.NET

**Course Code : 17UCA5C9**  
**Hours/ Week : 6**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide the concepts of VB.NET

### UNIT I

**18 Hours**

Creating a windows application – The .NET Framework and the common language runtime – The System Name Spaces – Building VB.NET applications – The Visual Basic IDE – The Visual Basic Keywords – Visual Basic Statements – The Option and Imports statement

### UNIT II

**18 Hours**

Declaring constants – Declaring variables - What Data types are available? - Declaring arrays and dynamic arrays- Handling Strings – Using Visual Basic Operators – Making decisions with if...else statements – Using Select case – Using the Do loop – Using the For loop – Using the For each...next loop- Using the while loop-Sub procedures and functions – Handling exceptions

### UNIT III

**18 Hours**

Windows Forms – Windows MDI Forms- Adding Controls to forms- Showing and Hiding Controls and Forms – Using the MsgBox function – Using the InputBox function – Setting the startup form – Creating Multiple Document Interface Applications – Creating Dialog Boxes – TextBoxes – Rich TextBoxes – Labels

### UNIT IV

**18 Hours**

Button – Check Boxes – Radio Buttons – List Boxes – Combo Boxes – Picture Boxes – Timers – Menus – Context Menus – Built- in Dialog Boxes – Tool bars – Status bars – Progress bars – Validation Controls – Required Field Validators – Comparison Validators – Range Validators – Regular Expression Validators – AdRotators

### UNIT V

**18 Hours**

What are Databases? – Accessing data with the server explorer – Accessing data with data adaptors and datasets – Working with ADO.NET – Creating a new data connection – Creating a dataset – Displaying data in a data grid – Connecting to an MS Jet Database – Using relational databases – Adding multiple tables to a dataset – Using data views

### Text Book

Steven Holzner, *Visual Basic .NET Black Book*, 2007

**UNIT I** : Chapters 1 & 2

**UNIT II** : Chapters 2 & 3

**UNIT III** : Chapters 4 & 5

**UNIT IV** : Chapters 6 to 10 & 18

**UNIT V** : Chapter 20

### Books for Reference

1. C. Muthu, *Visual Basic .Net*, Vijay Nicole Publication, 2007
2. ShirishChavan, *Visual Basic .Net*, Pearson Education, 2007

## SEMESTER – V: CORE – X: SCRIPTING LANGUAGES

**Course Code : 17UCA5C10**  
**Hours/ Week : 5**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide the basic knowledge of Java Script and VB Script

- UNIT I** **15 Hours**  
Introduction to Java script - Java script in web pages - Java script - Writing Java script - Writing Java script into HTML - Basic programming techniques - Operators and Expression in Java script - Programming constructs - Conditional checking - Super controlled loops - Functions in Java script
- UNIT II** **15 Hours**  
User defined functions - Dialogue Boxes - Java script DOM Introduction - Style sheet DOM JSSS DOM - Browser objects - HTML object hierarchy - Handling events using Java script
- UNIT III** **15 Hours**  
Forms used by a website - Form object- Built-in Objects Java script - User defined object - Cookies
- UNIT IV** **15 Hours**  
Introduction - Difference VB and VB Script - Programming in VB Script - VB Script function: Basic function - String function - Math function - Time & Date function
- UNIT V** **15 Hours**  
Intrinsic control: Introduction - Events in VB Script - Message in a GUI Environment - Placing Control - Intrinsic control - Checkbox - Select scripting model

### Text Books

1. IVAN BAYROSS, *Web Enabled commercial Application Development using..*, 3<sup>rd</sup> Revised Edition, BPB publications New Delhi-1  
**UNIT I** : Chapters 8 **UNIT II** : Chapter 9 **UNIT III** : Chapter 10 &11
2. Petroustos, Schongar, et al., *VBScript UNLEASHED*, First Edition, Sams.net Publishing  
**UNIT IV** : Chapter 3 **UNIT V** : Chapter4

### Reference Books

1. Douglas Crockford, *Java Script: The Good parts*, O'Reilly Media, 2008
2. Paul Lomax, Ron Petrusha, Matt Childs, *VBScript in a nutshell: A desktop quick reference*, O'Reilly Media, 2000

## SEMESTER – V: CORE – XI A: GENERAL APTITUDE

**Course Code : 17UCA5C11T**  
**Hours/ Week : 3**  
**Credit : 3**

**Maximum Marks : 50**  
**Internal Marks : 10**  
**External Marks : 40**

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**Objective** To provide the knowledge of logical reasoning and quantitative aptitude

**UNIT I** **6 Hours**

Average – Problems on Ages – Profit & Loss

**UNIT II** **6 Hours**

Ratio & Proportion – Time & Work – Problems on Trains

**UNIT III** **6 Hours**

Simple Interest – Permutations & Combinations – Odd man out & Series

**UNIT IV** **6 Hours**

Coding-Decoding – Blood Relations – Sequential Output Tracing

**UNIT V** **6 Hours**

Direction Sense Test – Number, Ranking & Time sequence test – Logical reasoning

### **Text Books**

1. Dr. R.S. AGGARWAL, *Quantitative Aptitude Fully Solved*, S. Chand Publications, 2010

**UNIT I** : Chapter 6,8,11

**UNIT II** : Chapter 12, 15, 18

**UNIT III** : Chapter 21, 30, 35

2. Dr. R.S. AGGARWAL, *Verbal and Non Verbal Reasoning (Revised Edition)*, S. Chand Publications, 2010

**UNIT IV** : Section I - Chapter 4, 5, 7

**UNIT V** : Section I- Chapter 8 and 11  
Section II – Chapter 1

## SEMESTER – V: CORE – XI B: SCRIPTING LANGUAGES LAB

**Course Code : 17UCA5C11P**  
**Hours/ Week : 2**  
**Credit : 2**

**Maximum Marks : 50**  
**Internal Marks : 10**  
**External Marks : 40**

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1. Write a JavaScript program to compute the sum of an array of integers
2. Write a JavaScript program to determine whether a given year is a leap year in the Gregorian calendar
3. Write a JavaScript for loop that will iterate from 0 to 15. For each iteration, it will check if the current number is odd or even, and display a message to the screen
4. Write a JavaScript program to calculate multiplication and division of two numbers
5. Write a JavaScript program to convert temperatures to and from Celsius, Fahrenheit
6. Write a JavaScript function that reverses a number
7. Write a JavaScript function that checks whether a passed string is palindrome or not
8. Write a JavaScript program to test the first character of a string is uppercase or not
9. Write a JavaScript program to set the background colour of a paragraph
10. Write a JavaScript program to check the given number is mobile number or not using form
11. Write a VBScript program for Fibonacci using for loop
12. Write a VBScript Program for age validation
13. Write a VBScript program to Copy contents of one folder to other folder
14. Write a VBScript program to demonstrate the checkbox and list box

## SEMESTER – V: CORE – XII A: VB.NET LAB

**Course Code : 17UCA5C12P1**  
**Hours/ Week : 3**  
**Credit : 3**

**Maximum Marks : 50**  
**Internal Marks : 10**  
**External Marks : 40**

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1. Develop a simple VB.NET application using web controls
  - a Finding factorial value
  - b) Money conversion
  - c Temperature conversion
2. Write a VB.NET program to perform the case conversion
3. Write a VB.NET program to create and validate login form using select case
4. Write a VB.NET program that makes use of InputBox, MsgBox and List Box
5. Write a VB.NET program that deals with the properties of TextBox and Label control
6. Develop a menu based VB.NET application to implement a text editor with cut, copy, paste, save and close operations
7. Write a VB.NET program that makes use of check box, radio buttons and list boxes
8. Write a VB.NET program to create a stopwatch and digital dice using timer control
9. Develop a web application using ASP.NET that uses validation controls
10. Develop a VB.NET application to create and adrotator
11. Develop a database application to store the details of students using ADO.NET
12. Develop a VB.NET application using data grid to insert, delete and update records

## SEMESTER – V: CORE – XII B: RDBMS LAB

**Course Code : 17UCA5C12P2**  
**Hours/ Week : 2**  
**Credit : 2**

**Maximum Marks : 50**  
**Internal Marks : 10**  
**External Marks : 40**

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### 1. SQL: Data Definition Languages

Table Creation - Primary Key, Candidate key,  
Foreign Key, On Delete Cascade  
Table Alteration - Rename table and Column name,  
Add Column, Drop column,  
Modify Column size and Data type  
Drop Table

### 2. SQL: Data Manipulation Languages

Insertion  
Updates  
Deletion  
String Operations  
Set Operations  
Tuple Variables  
Aggregate Functions with Grouping and Having Clause  
Ordering Tuples  
Nested Subqueries – Set Membership (IN, NOTIN),  
Set Comparison (SOME, ALL  
Sub-queries in the From Clause  
Join Operations – Equi Join, Left-outer join, Right outer join, Self Join  
Views

### 3. PL/SQL Procedure

Reverse the String  
Find Factorial number using Recursive Function  
Prepare Student Mark Sheet  
Employee Pay Roll  
EB – Bill

**SEMESTER – V: MAJOR BASED ELECTIVE - I:  
DATABASE MANAGEMENT SYSTEMS**

**Course Code : 17UCA5M1A**  
**Hours/ Week : 5**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide the concepts of database management systems

**UNIT I**

**15 Hours**

Introduction to Database Management Systems: File Based Data Management – Database Systems – Benefits of using a DBMS - Functions of DBMS – Components of DBMS – Data Dictionary – Database Users. Database Architecture and Design: Database Architecture – Data Abstraction – Data Independence – #Database Languages# – Design Constraints

**UNIT II**

**15 Hours**

Data Models: Relational Model – Object-oriented Model. E-R Modeling: E-R Model – E-R Model Components – E-R Diagram Conventions – Relationships. RDBMS: RDBMS Terminology – Relational Data Structure – Integrity Constraints. Data Normalization: Pitfalls in Relational Database Design - Decomposition – #Functional Dependencies# – Normalization – Keys – First Normal Form – 2nd Normal Form – 3rd Normal Form - Boyce-Codd Normal Form

**UNIT III**

**15 Hours**

Relational Algebra: Relational Algebraic Operations – Aggregate Functions – Update Functions - SQL: Characteristics of SQL – Advantages of SQL – Types of SQL Commands – SQL Operators. Tables and Views – #Queries - Subquerie s# – Aggregate Functions –INSERT, UPDATE and DELETE operations

**UNIT IV**

**15 Hours**

Files, File Organization and File Structures: Operations on Files – File Storage Organization – Physical Storage Media – Storage Access – Buffer Manager - File Organization - File Structure – Record Types. Indexing: Ordered Indexes – Hashing: Internal Hashing – External Hashing – Dynamic Hashing

**UNIT V**

**15 Hours**

Transaction Management and Concurrency Control : Transactions – ACID Properties –Transaction States – Concurrency Control – Serializability – Recoverability – Concurrency Control Schemes – Transaction Management in SQL – #Transactions and Recovery# – User-defined Transactions – The COMMIT, ROLLBACK and SAVEPOINT Commands – Backup and Recovery

# ..... # Self-study portion

**Text Book**

Alexis Leon & Mathews Leon, *Essentials of Database Management Systems*, McGraw-Hill Education India Pvt. Limited, 2009

**UNIT I** : 1.3, 1.4.1, 1.4.2, 1.7.1, 1.8 - 1.11, 2.2, 2.3, 2.5, 2.6, 2.8  
**UNIT II** : 3.6, 3.8, 4.2, 4.3, 4.4, 4.5, 6.2, 6.3, 7.2  
**UNIT III** : 9.2 – 9.4, 12.2 – 12.5, 13.1, 13.2, 14.1, 14.2, 15.1 – 15.6, 16.2 – 16.5  
**UNIT IV** : 20.2 – 20.4, 20.6 – 20.10, 21.2, 21.3 and  
**UNIT V** : 23.2 – 23.15

**Reference Book**

Rajesh Narang, *Database Management Systems*, PHI Learning (P Ltd, New Delhi, 4th Printing 2009

## **SEMESTER – V: MAJOR BASED ELECTIVE – I: RDBMS**

**Course Code : 17UCA5M1B**  
**Hours/ Week : 5**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To impart knowledge in database concepts and practical oriented approaches

### **UNIT I**

**15 Hours**

RDBMS Concepts: Introduction – Database Approach – DBMS – Comparison of File System with DBMS – Data Models – Entity-Relationship Model – RDBMS – Keys – Normalization – Client Server Computing – Oracle Architecture

### **UNIT II**

**15 Hours**

Beginning with SQL: Introduction – SQL Fundamentals – Data Types of SQL – Creating and Manipulating Tables: Introduction – Structure of Table – Table Creation Rules – Create Table Statement – Creating Table from an Existing Table – Role of Constraints to achieve – Data Integrity – Types of Constraints – To Display Information about Table – Altering Table – Removing Tables – Renaming Tables – Table available as Data Dictionary – DML Statement – Inserting Records – Updating Records – Deleting Records – Truncate Statement - Importance of TCL Statements

### **UNIT III**

**15 Hours**

Simple Data Retrieval Statement: SQL\*PLUS – Select Statement – Changing Column Heading with Column Aliases – Oracle Functions & Group by Clause: Introduction – Single Row Functions – Aggregate Functions – Group Data. Joins & Sub-queries: Types of Join – Nested Queries

### **UNIT IV**

**15 Hours**

Introduction to PL/SQL: Introduction – SQL vs PL/SQL – Advantages of PL/SQL – Architecture of PL/SQL – Structures of PL/SQL – PL/SQL Elements – Variables and Constants. Control Statement: Introduction – Conditional Control – Iterative Control – Sequential Control. Error Handling: Handling of Errors – Advantages of Exceptions – Exception Types – Cursor Handling: Introduction – Types of Cursor – Implicit Cursor Handling – Explicit Cursor Handling – Use of variable attributes %row type in Cursor – Cursor Loop

### **UNIT V**

**15 Hours**

Sub-Programs: Introduction – Advantages – Difference between Procedure and Function – Parts of Functions and Procedures – Procedure – Functions – Recursion – Packages: Introduction – Advantages – Dropping Package – Alter Package. Introduction – Types of Trigger – Creation of Triggers – Parts of Triggers – Error Handling in Triggers – Enabling and disabling Triggers

**Text Books**

Parteek Bhatia, Sanjiv Datta, Ranjit Singh, *Simplified Approach to Oracle*, Third Revised Edition 2008. Kalyani Publications

**UNIT I** : Chapter1: 1.1, 1.4, 1.5 – 1.10, 1.12. Chapter 2: 2.1, 2.2. Chapter 3: 3.4

**UNIT II** : Chapter 4: 4.1, 4.5, 4.6, Chapter5: 5.1 – 5.12. Chapter6: 6.2 – 6.6

**UNIT III** : Chapter7: 7.1 – 7.3. Chapter8: 8.1 – 8.4. Chapter9: 9.2, 9.3

**UNIT IV** : Chapter16: 16.1 – 16.7, Chapter17: 17.1 – 17.4, Chapter18: 18.2 – 18-4  
Chapter19: 19.1 – 19.5, 19.8, 19.9

**UNIT V** : Chapter20: 20.1 – 20.5, 20.7, 20.8, Chapter21: 21.1 – 21.4,  
Chapter22: 22.1 – 22.4, 22.5, 22.6, 22.10, 22.12

**Reference Books**

1. Ivan Bayross, *Commercial Application Development Using Oracle*, 2<sup>nd</sup> Revised Edition, BPB Publications, 2013

2. Rajeeb C. Chatterjee, *Learning Oracle SQL and PL/SQL: A Simplified Guide*, PHI Learning Private Limited, 2012

## SEMESTER – V: SKILL BASED ELECTIVE – II: SHELL PROGRAMMING

**Course Code** : 17UCA5S2A  
**Hours/ Week** : 2  
**Credit** : 2

**Maximum Marks** : 100  
**Internal Marks** : -  
**External Marks** : 100

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**Objective** To understand the fundamental concepts of Linux Programming

### UNIT I

**6 Hours**

Linux: An introduction – Linux Commands: Directory Oriented Commands – File Oriented Commands – Process Oriented Commands – #Communication Oriented Commands# – General Purpose Commands

### UNIT II

**6 Hours**

Pipes and Filters: Pipe – redirection – Filters – Vi Editor: Starting Vi modes – insert, delete and replace commands – #Search Commands# – Redo, Undo Commands

### UNIT III

**6 Hours**

Shell Programming: Shell script – Shell variables – escape mechanisms - Shell meta characters – #control statements# – iterative statements

### UNIT IV

**6 Hours**

Some sample Shell scripts – System Administration: system administrator – booting and shutting down the system – adding and deleting a user – Managing devices – Mounting file systems- Compression and Decompression – Backup – Remote system Accessing

### UNIT V

**6 Hours**

Programming GNOME and KDE: Introduction to Programming GNOME using GTK+ - Introducing X – Introducing GTK+ - GTK widgets – Dialogs. Programming KDE using Qt – Installing Qt – Qt widgets – Dialogs – Menus and toolbars with KDE

# ..... # **Self-study portion.**

### Text Books

1. Mohamed Ibrahim, *Linux – A Practical Approach*, By Firewall Media publications, 2005

**UNIT I** : Chapter 1 & 2

**UNIT II** : Chapter 3 & 4

**UNIT III** : Chapter 5

**UNIT IV** : Chapter 6 & 7

2. Neil Matthew, Richard Stones, *Beginning Linux Programming*, 4<sup>th</sup> Edition, 2014

**UNIT V** : Chapter 16 & 17

### Reference Book

Richard Petersen, *Linux – The Complete Reference*, Sixth Edition, Tata McGraw Hill Publications

## SEMESTER – V: SKILL BASED ELECTIVE – II: UBUNTU BASICS

**Course Code** : 17UCA5S2B  
**Hours/ Week** : 2  
**Credit** : 2

**Maximum Marks** : 100  
**Internal Marks** : -  
**External Marks** : 100

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**Objective** To understand the fundamental concept of Ubuntu operating systems

### UNIT I

**6 Hours**

What is Linux? – Problems with windows – Benefits of Linux – Different flavors of Linux – Ubuntu: African Philosophy – Who uses Linux? – Understanding how Linux differs from windows – Using Ubuntu – Installing Ubuntu – Pre installation steps – Installing Ubuntu

### UNIT II

**6 Hours**

Desktop elements – Shutting down or restarting Ubuntu – Ensuring Ubuntu Hardware support – Configuring Ubuntu – Getting Online – Using Power management preferences – How to secure your computer – Windows security vs. Linux security – Root and Ordinary users

### UNIT III

**6 Hours**

Ubuntu replacements for windows programs – Available software – A Quick start with common Ubuntu programs – Other handy applications

### UNIT IV

**6 Hours**

Introducing the bash shell – What is the bash shell? – Getting started with the shell – Working with files – Users and file permissions – File System Explained – File searches – File Size and free space – Viewing Text Files

### UNIT V

**6 Hours**

Using a command line text editor – Piping and directing the output – In depth: Writer – In depth: Calc – In depth: Impress – In depth: Base – Managing Users – Understanding user and group accounts – adding and deleting users and groups – adding and changing password

### Text Book

Keir Thomas and Andy Channelle, *Beginning Ubuntu Linux from novice to professional*, Fourth Edition

**UNIT I** : Chapter 1,2,4,5

**UNIT II** : Chapter 7, 8

**UNIT III** : Chapter 11

**UNIT IV** : Chapter 13, 14, 15

**UNIT V** : Chapter 23, 24, 25, 26, 29

### Reference Book

Matthew Hlemke, Amber Graner, *The Official Ubuntu Book*, 7<sup>th</sup> Edition

## SEMESTER – V: SKILL BASED ELECTIVE – III: SHELL PROGRAMMING LAB

**Course Code : 17UCA5S3AP**  
**Hours/ Week : 2**  
**Credit : 2**

**Maximum Marks : 100**  
**Internal Marks : -**  
**External Marks : 100**

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1. Working with basic Linux commands
2. Working with advanced and network Linux commands
3. Working with device oriented Linux commands
4. Working with editors and extraction of files using Linux commands
5. Write a Shell program to read a string using while and continue statements. If the given string has no value in it, then display “Null String” otherwise display the given string
6. Write a Shell program to read 2 words one after another. Display the first word, go to sleep mode for 30 seconds using ‘sleep’ command. After 30 seconds, display the second word
7. Write a Shell program for finding out the factorial of a given number using for loop
8. Write a Shell program to delete the files interactively using ‘rm’ command and ‘while’ statement
9. Write a Shell program using 3 arguments to take the pattern as well as input and output file names. If the pattern is found then display “Pattern Found” else display “Error Message”. Also check if right number of arguments is entered
10. Write a Shell script to check the user is eligible for vote or not [one must attain 18 years for voting [Ignore month differences]
11. Write a Shell script to check whether a given string is palindrome or not
12. Enhance the cp command to copy files. Display the necessary error message if error occurs
13. Write a Shell script for a file contains records with each record containing name of the city, name of the state and name of the country. How would you sort this file with country as the primary sort key and state as the secondary sort key
14. Write a Shell program to prepare the electricity bill based on the following conditions:
  - 1 to 100 units – Rs.0.75/unit
  - 101 to 200 units – Rs.1.50/unit
  - Above 200 units – Rs.300/unit
15. Write a Menu driven Shell program to copy, edit, rename and delete a file
16. Write a shell script to display the result “PASS” or “FAIL” using the information like Student, Name, Student Register Number, Mark1, Mark2, Mark3, Mark4. The Minimum pass for each subject is 50
17. Write a menu driven shell program for converting all the capital letters in a file to small case letters and vice-versa
18. Write a shell program, which accepts the name of the file from the standard input and then performs the following operations:
  - i. Enter the 5 names in a file
  - ii. Sort the names in existing file
  - iii. List unsorted and sorted file
  - iv. Quit
19. Write a shell script to sum up the following series :
$$1 + \frac{1}{2!} + \frac{1}{3!} + \dots + \frac{1}{n!}$$

## SEMESTER – V: SKILL BASED ELECTIVE – III: UBUNTU LAB

**Course Code : 17UCA5S3BP**  
**Hours/ Week : 2**  
**Credit : 2**

**Maximum Marks : 100**  
**Internal Marks : -**  
**External Marks : 100**

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1. Study of Writer
2. Study of Calc
3. Study of Impress
4. Study of Base
5. Study of Vi Editor
6. Write a shell script to perform the following:
  - i Copying a file ii moving a file iii renaming a file iv) deleting a file v) Creating a directory vi removing a directory (vii Changing a directory (viii Knowing the type of file
7. Write a shell script to perform the following:
  - i Viewing file permission ii Altering file permission
  - iii Changing ownership of a file (iv) Creating/displaying file content
  - v) less (vi head
  - vii tail
8. Write a shell script to perform the following commands:
  - i find (ii locate
  - iii whereis (iv) File Size
  - v) File Type (vi Free Space
  - vii Using GREP to find text

## SEMESTER – V: EXTRA CREDIT – I: JAVA SERVLETS

**Course Code** : 17UCA5EC1  
**Hours/ Week** : -  
**Credit** : 4

**Maximum Marks** : 100  
**Internal Marks** : -  
**External Marks** : 100

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**Objective** To understand the basic concepts of Java Servlet

### UNIT I

What are Servlet – Why use Servlet – What is Apache Tomcat – The basic flow – Servlet Example – Session Tracking – Cookies.

### UNIT II

Servlet Security Methodologies – HTTP Authentication – Custom HTTP Authentication – HTML Form Authentication – Applet Authentication – SSL.

### UNIT III

HTML Forms or Java Applets – Form Basics – Putting it all together.

### UNIT IV

JDBC Overview – JDBC Servlet – Connection Pooling.

### UNIT V

Sending E-Mail from Servlets: What are the options – Sending Mail using Smtplib – The JavaMail API.

### Text Book

Karl Moss, Java Servlets, Tata McGraw-Hill edition, New Delhi, 2002.

**UNIT I** : Chapter 1, 2 & 3  
**UNIT III** : Chapter 8  
**UNIT V** : Chapter 14

**UNIT II** : Chapter 4  
**UNIT V** : Chapter 9

### Reference Book

Bruce W.Perry, Java Servlet and JSP Cookbook, O'Reilly Media, 2004

## SEMESTER – VI: CORE – XIII: DATA COMMUNICATIONS AND NETWORKING

**Course Code : 17UCA6C13**  
**Hours/ Week : 5**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To understand the concepts of Data Communications and Networking

### **UNIT I**

**15 Hours**

INTRODUCTION: Computer Networks-Categories of Network- Open System and OSI model-Transmission Media-Transmission mode-Interfacing-Multiplexing-Types of Errors-Error Detection-Error Correction

### **UNIT II**

**15 Hours**

LAN: Types of Network and Topology-LAN Transmission Equipment- Token Bus-Token Ring-FDDI-Ethernet Technologies. WAN: WAN Transmission methods- WAN carrier types- WAN Transmission Equipment-WAN Protocols

### **UNIT III**

**15 Hours**

Switching: Circuit switching - Packet Switching – Message switching. Networking and Internetworking Devices: Repeaters – Bridges – Routers – Gateways. Routing Algorithms: Distance vector Algorithm – Link state Algorithm - Dijkstra Algorithm. TCP/IP Protocol Suite: Part-I: Network Layer-Internetwork Protocol (IP.Transport layer: UDP-TCP

### **UNIT IV**

**15 Hours**

Point-to-Point Protocol PPP: Transition states – PPP Layers-Link Control Protocol LCP - Network Control Protocol - ISDN: Services - ISDN Layers: Physical Layer-Data Link Layer-Packet Layer-Network Layer - Future of ISDN

### **UNIT V**

**15 Hours**

X.25:-X.25 Layers: Physical Layer-Frame Layer-Packet Layer-PLP packets-X.121 protocols - Triple-X protocols - ATM: Design Goals: Packet Networks-Mixed Network packets - Cell Networks - Asynchronous TDM - ATM Architecture - ATM Layers

### **Text Books**

1. Brijendra Singh ,*Data communication and Computer Networks*, Second edition

**UNIT I** : Chapter 1.3,1.4,1.7,2.4,2.7,2.8,2.9,3.1,3.2,3.3

**UNIT II** : Chapter 6.1,6.2,6.5,6.6,6.7,6.10

2. Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw Hill, Second Edition

**UNIT III** : Chapter 14, 21 and 24 **UNIT IV** : Chapter 15.1, 15.2, 15.3, 15.5

**UNIT V** : Chapter 17.1, 17.2, 19.1, 19.2, 19.5

### **Reference Book**

Wayne Tomasi, *Introduction to data communication and networking*, First edition

## SEMESTER - VI: CORE XIV: OPERATING SYSTEMS

**Course Code : 17UCA6C14**  
**Hours/week : 5**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide the fundamental concepts of an Operating System

### UNIT I

**15 Hours**

Introduction - What is an Operating System? - Mainframe Systems - Multiprocessor Systems - Distributed Systems – Real-time Systems - Computing Environment. Operating System Structures: System Components - Operating System Services - #Virtual Machines#

### UNIT II

**17 Hours**

Memory Management: Single Contiguous Allocation - Example of Multiprogramming - Partitioned Memory Management - #Paged Memory Management# - Demand Paged Memory Management - Swapping and Overlays

### UNIT III

**18 Hours**

Processor Management: Process Scheduling Functions - Policies - Job Scheduling in Non-Multiprogrammed Environment - Job Scheduling in Multiprogrammed Environment - Race Condition - #Deadly Embrace#. Deadlocks: Deadlock Characterization - Safe and Unsafe States in Deadlock Avoidance - Recovery from Deadlock

### UNIT IV

**15 Hours**

Device Management: Techniques for Device Management - Device Characteristics: Hardware Considerations - Channels and Control Units - #I/O Traffic Controller# - I/O Scheduler - I/O Device Handler - Virtual Devices: Relationship between SPOOLing and job Scheduling

### UNIT V

**10 Hours**

File Management: File System Interface: File Concept - Access Methods - File Protection - Directory Implementation - Allocation Methods - #Network File System: Overview#  
# .....# **Self-study portion**

### Text Books

1. Stuart E. Madnick& John J. Donovan, *Operating Systems*, Tata McGraw Hill Edition – 2011  
**UNIT II** : Chapter 3 3.1, 3.2, 3.5, 3.6, & 3.9)  
**UNIT III** : Chapter 4 4.1, 4.3 & 4.5)  
**UNIT IV** : Chapter 5 5.2 to 5.6)
2. Abraham Silberschatz, Galvin& Gagne, *Operating System Concepts*, 6<sup>th</sup> Edition, 2006  
**UNIT I** : Chapter 1 (1.1, 1.2, 1.4, 1.5, 1.7, 1.10) Chapter 33.1, 3.2, 3.6.1)  
**UNIT III** : Chapter 8 8.2 , 8.5.1, 8.7)  
**UNIT V** : Chapter 11 (11.1, 11.2, 11.6) Chapter 12 (12.3, 12.4, 12.9)

### Reference Book

Operating Systems - *Design and Implementation*, Andrew S. Tanenbaum and Albert S. Woodhull - III Edition, 2006

## SEMESTER - VI: CORE XV: SOFTWARE ENGINEERING

**Course Code : 17UCA6C15**  
**Hours/week : 5**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To provide fundamental concepts of software model, design, testing and quality

### UNIT I

**15 Hours**

Introduction-The evolving role of the software – The changing nature of software – Software myths – A generic view of process – A process framework – The CMM integration – The process models – The Waterfall model – The RAD model – The Evolutionary software process models – The Prototyping model – The Spiral model – Specialized Process models – The Component based development – #The formal methods model#

### UNIT II

**15 Hours**

Systems engineering hierarchy – Requirement engineering tasks – Requirements analysis – Analysis modeling approaches – #Data modeling concepts#– Flow-oriented modeling

### UNIT III

**15 Hours**

Design process and design quality – Design concepts – #Data design# – Architectural design –The art of debugging

### UNIT IV

**15 Hours**

Software testing fundamentals – White-box testing – Basis-path testing – Control structure testing – Black-box testing – Validation testing – System testing

### UNIT V

**15 Hours**

Quality Concepts – Software quality assurance – Software reviews – Formal technical reviews – Software measurement – Metrics for software quality  
# ..... # **Self-study portion**

### Text Book

Roger S Pressman, *Software Engineering-A Practitioner's Approach*, McGraw Hill International Edition, USA, 2008

- UNIT I** : Chapters 1 Section (1.1, 1.3, and 1.5) Chapters 2 Section (2.2, 2.3) Chapters 3 Section (3.2, 3.3.2, 3.4.1, 3.4.2, 3.5.1, 3.5.2)
- UNIT II** : Chapters 6.2, 7.2, 8.1, 8.2, 8.3, 8.6
- UNIT III** : Chapters 9.2, 9.3, 10.2, 10.4, 13.7
- UNIT IV** : Chapters 14.1, 14.3, 14.4, 14.5, 14.6, 13.5, 13.6
- UNIT V** : Chapters 26.1, 26.2, 26.3, 26.4, 22.2, 22.3

### Reference Book

K.L.James, *Software Engineering*, PHI Learning Pvt Ltd, Second edition, 2015

## SEMESTER – VI: CORE – XVI: SOFTWARE DEVELOPMENT LAB

**Course Code : 17UCA6C16P**  
**Hours/ Week : 5**  
**Credit : 5**

**Maximum Marks : 100**  
**Internal Marks : 20**  
**External Marks : 80**

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### 1. Web Page Development

**Objective** To provide basic coding knowledge for web designing

To design a Website using HTML, CSS and Java Script on any one of the following topics

- i Hotel Booking System
- ii E-Commerce Website
- iii Virtual Keyboard Design
- iv) College Website
- v) Tourism Website

### 2. Application with Database

**Objective** To provide basic knowledge of the real time applications of the IT industry

To develop mini real time applications using Java with MySQL on any one of the following topics

- i Attendance Management System
- ii Campus Recruitment System
- iii Student Feedback System
- iv) Course Registration System
- v) Web portal for Health Care

## SEMESTER – VI: MAJOR BASED ELECTIVE – II: PHP PROGRAMMING

**Course Code : 17UCA6M2A**  
**Hours/ Week : 5**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To understand the concepts of PHP programming

### UNIT I

**15 Hours**

Introduction and Overview: Lexical Structure – Data types – Expressions, Operators, Control Statements and Functions: Operator Precedence –Arithmetic, String Concatenation, Comparison, Bitwise, Logical and Assignment Operators – Flow Control Statements – Functions

### UNIT II

**15 Hours**

Strings: Quoting String Constants – Printing Strings – Cleansing Strings – Comparing Strings – Manipulating and Searching Strings – Arrays: Types of Arrays – Important functions in array – Functions on Complete Arrays – Sorting

### UNIT III

**15 Hours**

Objects: Object Oriented Concepts - Classes and Objects in PHP - Declaring Methods - Declaring Properties - Declaring Constants - Inheritance - Abstract Classes - Constructors - Destructors - Form Handling - Processing Forms - Form Validation. . Files and Directories – Opening and creating files in PHP – Closing files in PHP – File uploading in PHP – File Downloading in PHP – Reading the contents of a Directory – Deleting the contents of a Directory – Creating the new Directories

### UNIT IV

**15 Hours**

Cookies: Need for Cookies – Uses of Cookies – Anatomy of a Cookie – Creating and Accessing Cookies in PHP – Deleting Cookies – PHP Sessions – Starting a PHP Session – Storing a Session variable – Destroying a Session – Forms: Form Handling – Processing Forms – Form Validation

### UNIT V

**15 Hours**

MySQL: Connecting to and disconnecting from the Server – MySQL data types – SHOW and CREATE databases – Creating a table – DESCRIBE, INSERT and SELECT command – DROP tables and databases – Update, Alter and Delete Operations – MySQL access with PHP: Open a connection to the MySQL server – Disconnect a connection from MySQL server – Creating a database using PHP – Selecting MySQL database using PHP – Creating a table using PHP -Insert data into MySQL using PHP

### Text Book

HajiramBeevi J, Khairunnisa and MunawaraBanu S, *Primer on PHP*, Yazhini Publication, 1<sup>st</sup> Edition, 2016

**Unit I** : Chapter 1(1.3, 1.4), Chapter 2 (2.1, 2.3-2.10, and 2.12

**Unit II** : Chapter 3, 4

**Unit III:** Chapter 10, Chapter 6(6.1, 6.2, and 6.8 – 6.11)

**Unit IV:** Chapter 7, 11

**Unit V** : Chapter 8 (8.1- 8.9 ), Chapter 9(8.1 -9.6)

### Reference Book

Julie Meloni and Matt Telles, *PHP 6*, Course Technology, CENGAGE Learning, India Edition, 2008

## SEMESTER – VI: MAJOR BASED ELECTIVE – II: C# AND .NET PROGRAMMING

**Course Code : 17UCA6M2B**  
**Hours/ Week : 5**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : 25**  
**External Marks : 75**

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**Objective** To understand the basic concepts of C# and .Net Programming language

### UNIT I

**15 Hours**

What is C# - Why C# - Evolution of C# - Characteristics of C# - application of C# – The Origin of .Net Technology – The .Net framework – The Common Language Runtime - .Net language – Benefits of .Net Approach – C# and the .Net – Literals – Variables – Data Types – Declaration and Initialization of variables – Constant variables – Scope of variables – Boxing and unboxing

### UNIT II

**15 Hours**

Operators in C# - Expressions in C# - Decision making with if statement – Simple if statement – if...else statement – nested if ... else statement – else if ladder - switch statement - ?: operator – while statement – do statement – for statement – foreach statement – Declaring methods – main methods-invoking methods – nesting of methods –Handling arrays in C# - Manipulation Strings: String Methods

### UNIT III

**15 Hours**

Classes and objects – Inheritance and Polymorphism: Containment inheritance – Defining sub class - visibility control – multilevel inheritance – overriding methods – hiding methods – abstract class - defining an interface – extending interface –implementing interface. Delegates and Events – Managing Console I/O operations

### UNIT IV

**15 Hours**

Managing Errors and Exceptions – Types of Errors – Syntax of Exception Handling code – Multiple catch statements – The Exception Hierarchy – General catch handler – using finally statement – Nested try blocks – Throwing our own exceptions - using Exception for debugging – Multithreading in C#

### UNIT V

**15 Hours**

Windows Forms and Web based application Development on Net: creating windows forms – Customizing a form – Creating and running a sample win app widows application – overview of design patterns – creating and sample app- web based application on .Net

### Text Book

E. Balagurusamy, *Programming in C#*, Tata McGraw Hill Education Pvt. Ltd, New Delhi, 3<sup>rd</sup> edition 2012

### Reference Book

Troy Dimes, *C# Programming for Beginners*, Kindle Edition, 2015

## SEMESTER – VI: MAJOR BASED ELECTIVE – III: PHP PROGRAMMING LAB

**Course Code : 17UCA6M3AP**  
**Hours/ Week : 4**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : 20**  
**External Marks : 80**

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1. Program using Conditional Statements Switch and If...Else
2. Program to display the Fibonacci numbers
3. Program to find the factorial of a number
4. Program using Conditional Statements
5. Program to find the maximum value in a given multi-dimensional array
6. Program to find the GCD of two numbers using user-defined functions
7. Program to illustrate the use of constructors and destructors
8. Design a simple web page to generate multiplication table for a given number using PHP
9. Design a web page that should compute one's age on a given date using PHP
10. Write a program in PHP
  - i. to upload a file
  - ii. to download a file
11. Program to download a file from the server
12. Program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page
13. Program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page
14. Program to draw the human face
15. Program to design a simple calculator
16. Design an authentication web page in PHP with MySQL to check username and password

**SEMESTER – VI: MAJOR BASED ELECTIVE – III:  
C# AND .NET PROGRAMMING LAB**

**Course Code : 17UCA6M3BP**

**Hours/ Week : 4**

**Credit : 4**

**Maximum Marks : 100**

**Internal Marks : 20**

**External Marks : 80**

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1. Program to demonstrate nested if statement
2. Program to demonstrate else if ladder
3. Program to find sum of series using foreach statement
4. Program to perform various arithmetic operations using switch statement
5. Program to print the reverse order of a given number using do....while
6. Program to sort and to reverse the numbers using sort functions
7. Program to demonstrate ArrayList class
8. Program to find the vowels of a given string using string handling functions
9. Program to demonstrate multilevel inheritance
10. Program to create and implement a delegate
11. Program using try and catch for exception handling
12. Program to create and implement an event handler
13. Program to demonstrate the multithreading
14. Develop a windows application for simple calculator
15. Develop a windows application to prepare student mark sheet

## SEMESTER – VI: EXTRA CREDIT – II: OPEN SOURCE COMPUTING

**Course Code : 17UCA6EC2**  
**Hours/ Week : -**  
**Credit : 4**

**Maximum Marks : 100**  
**Internal Marks : -**  
**External Marks : 100**

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**Objective** To learn the basics of open source computing

### UNIT I

INTRODUCTION: Free Vs Open Source - Needs -Advantages -Applications -OSS Licences -FOSS Environment Kernel configuration, compilation and installation, Compiling from source –build systems auto\* family, cmake, ant, autoconf, automake, GTK and Qt, Version Control System -RCS - CVS –SVN

### UNIT II

OPEN SOURCE DATABASE: MySQL Introduction -Data Types -Operators -Functions -Working with Databases, Tables and Data -Joins and Subqueries -Transaction -Administration and Deployment.

### UNIT III

OPEN SOURCE WEB PROGRAMMING: PHP Basics - Data types - operators and flow control - String - Arrays - Functions - PHP with HTML - Client side validation - Working with Databases - Running PHP applications.

### UNIT IV

RUBY AND RAILS: Installation on windows, Mac OS, Linux and Unix - Numbers - Strings -Variables - Constants - Conditions, Loops, Methods and Blocks - Classes and Objects - Ruby on Rails - Model View - Controller Architecture - Simple Rail Application.

### UNIT V

WEB SERVER: Application Server Vs Web server – Characteristics of Web server - Case Study Apache Web Server - Setting up complete network – if config command.

### Text Books

1. Vikram Vaswani, “The Complete Reference - MySQL”, Tata McGraw Hill, 2006
2. Steven Holzner, “PHP The Complete Reference”, Tata McGraw Hill, 2010
3. Steven Holzner, “Beginning Ruby on Rails”, Wiley, 2007.

### Reference Books

1. Karl Fogel, “Producing Open Source Software”, Shroff, 2006
2. Ivan Bayoss and Shranam shah, “PHP5.1 for beginners”, Shroff, 2010
3. Eliot Smith and Rob Nichols, “Ruby on Rails”, PACKT, 2008