

**NATIONAL COLLEGE**  
**(AUTONOMOUS)**  
**Nationally Re-Accredited at “A+” Level by NAAC**  
**Tiruchirapalli – 620 001**  
**Under Graduate Programme Structure under**  
**CBCS**  
**(For candidates admitted from the year 2022 – 2025**  
**onwards)B.Sc. (Information Technology)**

**Eligibility:**

- *Candidates for admission to the first year programme leading to the Degree of Bachelor of Information Technology will be required to possess.*
- *Pass with 50% of marks in HSC. In case of SC/ST candidates, merely pass with 40%of marks in HSC will be sufficient.*

**Aim:**

*Our aim is a high quality degree program that ensures that students will be able to integrate theory and practice, recognize the importance of abstraction and appreciate the value of efficient design created to meet clearly developed requirements.*

**Objective:**

- *The B. B.Sc. degree in Information Technology provides students the opportunity to acquire knowledge and skills to develop their understanding creatively and professionally.*
- *The Programme balances theory with ‘real world’ practice in information and computer management.*
- *Students will acquire a comprehensive understanding of computer Information Techonology and a grasp of the central elements of a computer system.*
- *Graduates will be prepared for the next step in their careers, for example, having done a research project (for those headed to graduate school), a programming project (for those going into the software industry), or some sort of business plan (for those going into startups).*

**Programme Outcomes (POs)**

**PO1: Basic knowledge:** *Apply the knowledge of mathematics, science, fundamentals to the solution of complex problems.*

**PO2: Problem analysis:** *Identify, formulate, review research literature, and analyze complex problems reaching substantiated conclusions using first principles of mathematics.*

**PO3: Design/development of solutions:** *Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate considerationfor the public health and safety, and the cultural, societal, and environmental considerations.*

**PO4: Modern tool usage:** *Create, select, and apply appropriate techniques, resources, and*

*modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.*

***PO5: Environment and sustainability:*** *Understand the impact of the professional solutions in societal and environmental contexts and demonstrate the knowledge and need for sustainable development.*

***PO6: Ethics:*** *Apply ethical principles and commit to professional ethics, responsibilities and norms of the engineering practice.*

***PO7: Individual and team work:*** *Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.*

***PO8: Communication:*** *Communicate effectively on complex activities with the community and with society at large, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.*

***PO9: Project management and finance:*** *Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.*

***PO10: Life-long learning:*** *Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.*

| <b>B.Sc., INFORMATION TECHNOLOGY</b> |   |  |                              |               |                |                |              |
|--------------------------------------|---|--|------------------------------|---------------|----------------|----------------|--------------|
|                                      | <b>PART</b>   | <b>COURSE TITLE</b>                                      | <b>INSTRU.<br/>Hrs./WEEK</b> | <b>CREDIT</b> | <b>MARKS</b>   |                | <b>TOTAL</b> |
|                                      |   |  |                              |               | <b>INT(25)</b> | <b>EXT(75)</b> |              |
|                                      |   |  |                              |               |                |                |              |
| <b>SEMI</b>                          | <b>I</b>  | U22T1, U22H1, U22S1-Tamil-I/Hindi-I/ Sanskrit-I          | 6                            | 3             | 25             | 75             | 100          |
|                                      | <b>II</b>   | U22E1- English - I                                       | 6                            | 3             | 25             | 75             | 100          |
|                                      | <b>III</b>  | <b>U22IT1 - Programming in C</b>                         | 5                            | 5             | 25             | 75             | 100          |
|                                      |   | <b>U22 IT2P-Programming in C Lab</b>                     | 3                            | 5             | 25             | 75             | 100          |
|                                      |   | U22IAMS1C–Mathematics –I                                 | 5                            | 3             | 25             | 75             | 100          |
|                                      |   | U22IAMS2C-Mathematics -II                                | 3                            | -             | 25             | 75             | -            |
|                                      | <b>IV</b>   | U22ES- Environmental Studies                             | 2                            | 2             | 25             | 75             | 100          |
| <b>Paper : 7</b>                     |   |  | <b>30</b>                    | <b>21</b>     | <b>25</b>      | <b>75</b>      | <b>600</b>   |
| <b>SEM II</b>                        | <b>I</b>  | Tamil-II/Hindi-II/ Sanskrit-II-U22T2, U22H2, U22S2       | 6                            | 3             | 25             | 75             | 100          |
|                                      | <b>II</b>   | English - II U22E2                                       | 4                            | 2             | 25             | 75             | 100          |
|                                      |   | Communicative English - I U22CE1                         | 2                            | 1             | 25             | 75             | 100          |
|                                      | <b>III</b>  | <b>U22IT3 – Fundamentals of Information Technology</b>   | 5                            | 5             | 25             | 75             | 100          |
|                                      |   | <b>U22IT4P–PC Packages SoftwareLab</b>                   | 3                            | 3             | 25             | 75             | 100          |
|                                      |   | U22IAMS2C –Mathematics II                                | 3                            | 3             | 25             | 75             | 100          |
|                                      |   | U22IAMS3C –Mathematics III                               | 5                            | 3             | 25             | 75             | 100          |
| <b>IV</b>                            | <b>U22SBE1C- Skill Based Elective I-Web page designing using HTML</b> | 2  | 2                            | 25            | 75             | 100            |              |
| <b>Papers : 8</b>                    |   |  | <b>30</b>                    | <b>22</b>     | <b>25</b>      | <b>75</b>      | <b>800</b>   |
| <b>SEM III</b>                       | <b>I</b>  | U22T3, U22H3, U22S3-Tamil-III / Hindi –III /Sanskrit–III | 6                            | 3             | 25             | 75             | 100          |
|                                      | <b>II</b>   | U22E3-English-III  | 6                            | 3             | 25             | 75             | 100          |
|                                      | <b>III</b>  | <b>U22IT5 – Database Design</b>                          | 6                            | 4             | 25             | 75             | 100          |
|                                      |   | <b>U22IT6P- MySQL Lab</b>                                | 3                            | 3             | 25             | 75             | 100          |
|                                      |   | U22ACO1IT–Allied Paper I Financial Accounting            | 5                            | 3             | 25             | 75             | 100          |
|                                      | <b>IV</b>   | U22SBE2C - SkillBasedElective II - Java Script & PHP     | 2                            | 2             | 25             | 75             | 100          |
|                                      |   | U22SBE3CP – HTML, Java Script and PHP Lab                | 2                            | 2             | 25             | 75             | 100          |
| <b>Papers : 7</b>                    |   |  | <b>30</b>                    | <b>20</b>     | <b>25</b>      | <b>75</b>      | <b>700</b>   |
|                                      |   |  |                              |               |                |                |              |

|                                    |   |   |            |    |               |               |      |
|------------------------------------|---|---|------------|----|---------------|---------------|------|
| <b>II<br/>year<br/>SEM<br/>IV</b>  | <b>I</b>  | U22T4/ U22H4/ U22S4 - Tamil – IV / Hindi –IV / Sanskrit – IV                        | 6          | 3  | 25            | 75            | 100  |
|                                    | <b>II</b>                                       | U22E4- English - IV   | 4          | 2  | 25            | 75            | 100  |
|                                    |   | U22CE2- Communicative English - II  | 2          | 1  | 25            | 75            | 100  |
|                                    | <b>III</b>                                      | <b>U22IT7 – Data Structures and Algorithms</b>                                      | 4          | 4  | 25            | 75            | 100  |
|                                    |   | <b>U22IT8P – Data Structures Lab</b>  | 2          | 3  | 25            | 75            | 100  |
|                                    |   | U22ACO2ITTP – Allied Paper II<br>Accounting Package (Theory (45)& Lab(30))          | 4          | 3  | 25<br>(15+10) | 75<br>(45+30) | 100  |
|                                    | <b>IV</b>                                       | U22ACO3IT- Allied Paper III<br>Enterprise Resource Planning                         | 4          | 3  | 25            | 75            | 100  |
|                                    |   | <b>U22NMEN1 – Basic Concepts of Computer Science</b>                                | 2          | 2  | 25            | 75            | 100  |
|                                    |   | U22VE – Value Education   | 2          | 2  | 25            | 75            | 100  |
|                                    |   | Extra Credit Course I :Animation Lab,Flash and Photoshop                            | -          | 4* | 25            | 75            | 100* |
|                                    | Extra Credit Course II : Multimedia Technology. | -   | 4*         | 25 | 75            | 100*          |      |
|                                    | <b>Paper : 9</b>                                | <b>30</b>   | <b>23</b>  |    |               | <b>900</b>    |      |
| <b>III<br/>year<br/>SEM<br/>V</b>  | <b>III</b>                                      | <b>U22IT9 - Programming in Java</b>   | 5          | 5  | 25            | 75            | 100  |
|                                    |   | <b>U22IT10P- Programming in Java Lab</b>  | 5          | 3  | 25            | 75            | 100  |
|                                    |   | U22 IT11- Computer Networks   | 5          | 5  | 25            | 75            | 100  |
|                                    |   | U22 IT 12E -Computer Graphics/Principles of Animation/Visual Effects                | 5          | 5  | 25            | 75            | 100  |
|                                    | <b>IV</b>                                       | U22IT13E -PC Hardware and Trouble shooting /Software Analysis and Design/OOAD       | 5          | 4  | 25            | 75            | 100  |
|                                    |   | <b>U22NMCS2 – Introduction To ICT</b>   | 2          | 2  | 25            | 75            | 100  |
|                                    |   | U22SS– Soft Skill   | 2          | 2  | 25            | 75            | 100  |
|                                    |   | Extra Credit Course III: BPO (Business Processing Outsource).                       | -          | 4* | 25            | 75            | 100* |
|                                    | <b>Paper : 7</b>                                | <b>30</b>   | <b>26</b>  | 25 | 75            | <b>700</b>    |      |
| <b>III<br/>year<br/>SEM<br/>VI</b> | <b>III</b>                                      | <b>U22IT14 – Operating System</b>   | 6          | 5  | 25            | 75            | 100  |
|                                    |   | <b>U22IT15 – Python Programming</b>   | 6          | 5  | 25            | 75            | 100  |
|                                    |   | <b>U22IT16P – Python Programming Lab</b>  | 6          | 5  | 25            | 75            | 100  |
|                                    |   | <b>U22IT17E - Advanced Excel lab</b>  | 3          | 3  | 25            | 75            | 100  |
|                                    |   | <b>U22IT18- Software Engineering</b>  | 3          | 3  | 25            | 75            | 100  |
|                                    |   | U22IT19E–/ Information Security/Digital Watermarking And Steganography/Cryptography | 5          | 5  | 25            | 75            | 100  |
|                                    | <b>V</b>  | U22GS – Gender Studies  | 1          | 1  | 25            | 75            | 100  |
|                                    |   | Extension Activity  |            | 1  | 25            | 75            | 100  |
|                                    |   | Extra Credit Course IV: Cloud Computing.  | -          | 4* | 25            | 75            | 100* |
|                                    | <b>Paper : 7</b>                                | <b>30</b>   | <b>28</b>  | 25 | 75            | <b>800</b>    |      |
|                                    | <b>GRAND TOTAL</b>                              | <b>180</b>  | <b>140</b> | -  | -             | <b>4500</b>   |      |

***\*Extra Credits are not included in Grand Total.***

***Semester I***

***Hours/Week:5***

***Core Course I (U22IT1)***

***Programming in C***

***Credit: 5***

***COURSE OBJECTIVES***

- *The course is designed to provide an extensive study of the C programming language.*
- *This course is emphasized the strengths of C which provides students to write a program efficiently.*
- *This course is offered to design the wide variety of examples and applications in C language.*
- *This course is underlined to learn some other programming languages and how to choose the particular programming language for solving the problem.*

***COURSE OUTCOMES***

*Upon successful completion of this course, students will be able to*

*CO1: Understand the fundamentals in C programming.*

*CO2: Develop knowledge to write, compile and debug C program.*

*CO3: Explain identifiers, operators, type conversion and other features of C language.*

*CO4: Understand different data types in C language.*

*CO5: Demonstrate the control statements like decision making and looping*

*.CO6: Illustrate the concepts of functions, arrays and strings.*

*CO7: Understand the concept of pointers and Structures.*

*CO8: Use different data file structures and unions.*

*CO9: Study the complexity of problems, modularize the problems into small modules and then convert them into programs.*

***UNIT – I***

*History of C – Importance of C – Basic structure of C Program – Data types – Declaration of variables – Declaration of storage class - Operators and Expressions – Built –in Functions.*

***UNIT – II***

*Managing Input and Output operations – Decision making and branching (IF, IF-ELSE, ELSE – IF Ladder, SWITCH, GOTO) - Decision making and looping (WHILE, DO – WHILE, FOR, BREAK and CONTINUE).*

***UNIT – III***

*User-defined Functions: Introduction, Elements of User-defined Functions – Definition of functions – Return values and their types – Function call – Function declaration – Category of functions – No arguments and no return values – Arguments but no return values - Arguments with return values – No arguments but return a value – Functions that return multiple values – Recursion – The scope, visibility and lifetime of variables – Arrays – Passing arrays to functions – Table of strings – String handling functions.*

***UNIT – IV***

*Pointers: Introduction – Declaring pointer variables – Initialization – Accessing a variable*

*through its pointer – Pointers and arrays – Pointer and character strings — Arrays of Pointers –Pointers to Functions – Structures and Unions: Introduction – Defining a structure – Declaring a structure variable – Accessing structure members – Structure initialization– Pointers and structures - Unions.*

#### **UNIT – V**

*File management in C: Introduction – Defining and opening a file – Closing a file – Input/Output operations on files – Random access to files – Bitwise Operations – The preprocessor: Introduction – Macro substitutions.*

#### **Text Book:**

1. E. Balagurusamy, “Programming in C “, 4<sup>th</sup> Edition, Tata McGraw Hill Publications.

*UNIT I: Chapter 1 Sections 1.1, 1.2,1.8 Chapter 2 Sections 2.7 – 2.9 Chapter 3 Sections 3.1 – 3.12, 3.14,Appendix III*

*UNIT II: Chapter 4 Sections 4.1 – 4.5 Chapter 5: Sections 5.1 – 5.9 Chapter 6 Sections 6.1 – 6.5*

*UNIT III: Chapter 9 Sections 9.1,9.4 – 9.14, 9.16, 9.22 Chapter 7 Sections 7.1 – 7.7 Chapter 9 Section 9.17 Chapter 8 Section 8.9, Chapter 8 Section 8.8*

*UNIT IV: Chapter 11 Sections 11.1, 11.4 – 11.6, 11.10 - 11.12, 11.15,*

*Chapter 10 Sections 10.1 – 10.5, 10.12 Chapter 11 Section 11.16.*

*UNIT V: Chapter 12 Section 12.1 – 12.4, 12.6, Appendix I, Chapter 14 Sections 14.1, 14.2*

#### **Reference Books:**

1. Byron S. Gottfried, “Programming with C”, 2<sup>nd</sup> Edition,Sehaum’s outline series, Tata McGraw Hill Publications.
2. Mullish Cooper, “The Spirit of C“, 4<sup>th</sup> Edition, Schaum’s Outline Series, Tata McGraw Hill Publications.
3. T. Jeyapoovan, “A first course in Programming with C“, Vikes Publishing House Pvt. Ltd, NewDelhi.

**Semester I**

**Core Course (U22IT2P)**

**COURSE OBJECTIVES**

**Programming in C Lab**

**Hours/Week: 3**

**Credit: 5**

- *The course gives hands- on experience on C programming and improves the practical skill set.*
- *This course demonstrates the learners to develop the logic for the given problem recognize and understand the syntax and construction of C program.*
- *This course involved in compiling, linking and debugging C program and to develop some complex programs.*

**COURSE OUTCOMES**

*Upon successful completion of this lab Course, student will be able to*

*CO1: Understand the basic concept of C Programming and its different modules.*

*CO2: Acquire knowledge about the basic concept of writing, compile and debug C program*

*CO3: Demonstrate the role of identifiers, operators, type conversion*

*CO4: Explain the control statements like decision making and looping to solve problems associated with conditions and repetitions.*

*CO5: Explain the role of Functions involving the idea of modularity.*

*CO6: Understand the concept of Array and pointers dealing with memory management.*

*CO7: Use the structures and unions through which derived data types can be formed.*

*CO8: Understand the file handling for permanent storage of data.*

**Program to implement the following concepts**

1. *Control statements*
2. *Looping structures*
3. *Functions*
4. *Arrays*
5. *String manipulations*
6. *Structures*
7. *Application*
8. *Debugging*





**COURSE OBJECTIVES :**

- To Provide the Basic Concepts in Information Technology
- Give students an in-depth understanding of why computers are essential components in business, education and society.
- To gain the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal use of computer hardware and software, the Internet, networking and mobile computing.

**COURSE OUTCOMES:**

- CO1: On completion of this course, the student will be able apply technical knowledge and perform specific technical skills,  
CO2: Describe the usage of computers and why computers are essential components in business and society.  
CO3: To get Memory and basic Number System knowledge.  
CO4: Utilize the Internet Web resources and evaluate on-line e-business system.  
CO5: Solve common business problems using appropriate Information Technology applications and systems.  
CO6: Identify categories of programs, system software and applications. Organize and work with files and folders.  
CO7: Describe various types of networks network standards and communication software.

**Unit I**

Introduction to Computers - Generation of Computers - Classification of Digital Computer  
- Anatomy of Digital Computer. **Unit**

**II**

Number Systems and Codes: Decimal, Binary, Octal and Hexadecimal Systems –conversion from one to another – Complements; Binary Addition, Subtraction, Multiplication & Division; Codes: BCD, Weighted, Excess Three, Gray, ASCII and Error Detecting Codes.

**Unit III**

Architecture of Computer - CPU and Memory - Secondary Storage Devices – Input Devices - Output Devices. Introduction to Computer Software - Programming Language – Operating Systems - Introduction to Database Management System - Data Mining and On-line Analytical Processing.

**Unit IV**

Computer Networks - WWW and Internet - Email - Intranets – Mobile Computing and Business on the Internet.

**Unit V**

Introduction to Multimedia - Multimedia Applications - Computers at Home, Education, Entertainment, Science, Medicine and Engineering - Introduction to Computer Security - Computer Viruses, Bombs, Worms.

**Text Book:**

1. Fundamentals of Information Technology ,Alexis Leon And Mathews Leon, Vikas Publishing House Pvt. Ltd,2009
2. Digital Computer Fundamentals – Thomas C. Bartee, 6th Edition, Tata McGraw Hill, New Delhi,

**Reference Book:**

1. *Information Technology - The Breaking Wave*, Dennis P. Curtin, Kim foley, KunalSen and Cathleen Morin, Tata -McGraw Hill Publications, 2005

**Semester II****Core Course U22IT4P****PC PACKAGE LAB****Hours/Week: 3****Credit: 3****COURSE OBJECTIVE**

- *To learn about computer components, System configuration and utilities.*
- *To understand the basic concepts of Application software.*
- *To gain the detailed knowledge about MS office package and internet concepts.*

**COURSE OUTCOMES**

*Upon successful completion of this course, students will be able to*CO1.

*Understand the components of computer.*

*CO2. Understand the fundamental concept of configuring the system, utilities*CO3. *Know about the utilities such as disk cleanup, disk fragment etc.,*

*CO4. Work on Ms Office package(MS Word 2000, MS Excel 2000, MS PowerPoint 2000* CO5. *Solve mathematical problems and database problems with the help of computer* CO6. *Get good understanding of internet(sending and reading E-Mails, Attachments etc.,)*CO7. *Work with files and folders.*

**1. WINDOWS OPERATING****SYSTEM Understanding**

1. *Windows elements - desktop, icons, taskbars.*
2. *Configuring the system - Checking the system configuration, Date/time, Disk*
  - a. *partitions, Add/remove programs*
3. *Utilities – disk cleanup, disk defragmenter etc...*
4. *Working with files and folders - Create, rename, edit, move, delete etc...*

**2. MS-OFFICE****MS-WORD**

1. *Text Manipulations*
2. *Usage of Numbering, Bullets, Tools and Headers*
3. *Letter formatting*
4. *Text Formatting*
5. *Picture Insertion and Alignment*
6. *Creation of Documents Using Templates`*
7. *Mail Merge*
8. *Copying Text and Picture From Excel*
9. *Creation of Tables, Formatting Tables*

### ***MS-EXCEL***

- 1. Creation of Worksheet and Entering Information*
- 2. Aligning, Editing Data in Cells*
- 3. Date, Time, Statistical, Mathematical, Financial Functions*
- 4. Changing of Column Width and Row Height*
- 5. Moving, copying, Inserting and Deleting Rows and Columns*
- 6. Formatting Numbers and Other Numeric Formats*
- 7. Drawing Borders around Cells*
- 8. Creation of Charts*

### ***MS -POWER POINT***

- 1. Creating, saving, closing presentation*
- 2. Adding Headers and footers*
- 3. Changing slide layout*
- 4. Working fonts and bullets*
- 5. Inserting and working with Clip art*
- 6. Applying Transition and animation effects*

### ***3. INTERNET BASICS***

- 1. Creating an email-id.*
- 2. Composing, sending and forwarding a mail.*
- 3. Downloading the mail attachment.*
- 4. Sending a mail using cc and bcc options.*
- 5. Searching using search engine*

**COURSE OBJECTIVES**

- To get a clear understanding principles of creating an effective web page through HTML.

**COURSE OUTCOME**

Upon successful completion of this course, Student will be able to

**CO1:** To apply markup languages for processing, identifying, and presenting of information in web pages.

**CO2:** To learn scripting languages and web services to transfer data and add interactive components to web pages.

**CO3:** Insert a graphic within a webpage

**CO4:** Create a link within a webpage

**CO5:** Insert heading levels within a webpage

**CO6:** Insert ordered and unordered list within a webpage

**CO7:** Create and view a webpage.

**UNIT I**

Introduction to HTML- Designing a Home page- History of HTML- HTML Generations- HTML Documents- Anchor Tag-Hyper Links.

**UNIT II**

Header Section- Title- Prologue- Links- Colorful Web Page- Comment Lines- Designing the Body Sections- Heading printing- Aligning the headings- Horizontal rule- Paragraph.

**UNIT III**

Tab Settings- Images and Pictures- Embedding PNG Format Images- Lists- Unordered Lists- Ordered Lists- Nested Lists.

**UNIT IV**

Tables- Table Creation in HTML- Width of the Table and Cells- Cells Spanning Coloring Cells- Column Specification- Style Sheets- Defining Styles- Elements of Styles Linking a Style Sheet to an HTML document- In-line Styles- External Style Sheets- Internal Style Sheets- Multiple Styles.

**UNIT V**

Frames-Frameset Definition- Frame Definition- Nested Frameset- Forms- Action Attribute-Method Attribute- Enctype Attribute- Drop Down List.

**Text Book:**

C.Xavier, "World Wide Web Design with HTML", Tata McGraw Hill, New Delhi, 2010. Unit

1: chapter 4(sec 4.1-4.6)

Unit 2: chapter 5(sec 5.1-5.6) chapter 6(sec 6.1,6.3)

Unit 3: chapter 6(sec 6.4-6.7) chapter 7(sec 7.1, 7.2, 7.4, 7.5)

Unit 4: chapter 8(sec 8.1-8.6)

Unit 5: chapter 9(sec 9.1-9.7)

**Reference Book:**

Joel Sklar, "Web Design Principles" Vikas Publications 2000.



**SEMESTER - III**

**Core Course- U22IT5      DATABASE DESIGN**

**Hours/Week:6**

**Credit: 4**

**OBJECTIVES:**

The aims of the course are as follows:

- To understand and use a relational database system.
- To design ER Diagrams
- To apply normalization techniques to create a database.

**COURSE OUTCOMES:**

- CO1**      To gain ethical knowledge of Database Concepts and Database Management System
- CO2**      High-level understanding of major DBMS components and their function  
Able to model an application's data requirements using Conceptual Modeling Tools
- CO3**      Like ER diagrams and design database schemas based on the conceptual model.
- CO4**      Able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- CO5**      Program a data-intensive application using DBMS APIs.
- CO6**      Program a data-intensive application using DBMS APIs.

**UNIT- I : INTRODUCTION TO DATABASE SYSTEM**

Introduction – Characteristics of the Database Approach - Database Administrators and Designers - Advantages of DBMS Approach – History of Database Applications.

**UNIT- II : DATA MODELING**

Database System Concepts and Architecture: – Three levels of Architecture – The External level – Conceptual Level – Internal Level – Client/Server Architecture- Introduction to ER Model – ER diagrams – Database Design with ER model – A brief Analysis of the ER Model

**UNIT- III : NORMALIZATION**

Introduction – Trivial and non-trivial Dependencies – Closure of a set of Dependencies – Closure of a set of attributes- Introduction – Nonloss Decomposition and Functional Dependencies – First, Second and Third Normal form – Dependency Preservation – Boyce/Codd Normal form – Relation Valued Attributes.

**UNIT- IV: RELATIONAL DATABASE MODELS**

The Relational Database Model: Types – Relations – Relational Algebra – Relational Calculus.

**UNIT- V: SQL**

Introduction to SQL: Overview – Catalog – Views – Transactions Embedded SQL – Dynamic SQL and SQL /CLI-Data Definition Commands-Data Manipulation Commands.

**TEXT BOOKS:**

1. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, Addison-Wesley, 2011

**REFERENCE:**1. Atul Kahate, Introduction to Database Management System.

**SEMESTER - III**

**Core Course- U22IT6P**

**MySQL LAB**

**Hours/Week:3**

**Credit:**

**3**

**COURSE OBJECTIVES**

- *To create and manage connections to database servers.*
- *To get familiar with basic commands in MySQL.*
- *To learn to write SQL query and stored program in MySQL.*

**COURSE OUTCOMES**

*CO1: Design and implement a database schema for a given problem-domain*

*CO2: Create and maintain tables using SQL*

*CO3: Populate and query a database*

*CO4: Prepare QUERIES*

*CO5: Create Function*

*CO6: Create Trigger program*

**MySQL PROGRAM :**

- 1. Create a simple Relational Database in MySQL.*
- 2. Performing DDL, DML operations in a table.*
- 3. Performing Join & Set operations*
- 4. Aggregate functions in SQL*
- 5. Subqueries*
- 6. Function*
- 7. Creating Package*
- 8. Creating Triggers*
- 9. Simple PL/SQL programs (Non-database problems).*
- 10. Create Views of the Database*

**Semester III**  
**Second Allied Course I**

**Allied Paper I**  
**(U222ACO1IT)**  
**(Financial Accounting)**

**Hours/Week: 5**  
**Credit: 3**

**Course Objective**

- ✓ To enable the students to learn principles and concepts of accountancy.
- ✓ To enable the students to prepare final accounts of sole traders.
- ✓ To know the basic concepts of commercial bills.
- ✓ To understand the students to prepare Accounting for consignment and joint ventures to understand about the concepts of reserves and provisions.
- ✓ To overall students can acquire conceptual knowledge of the financial accounting and to provide knowledge about the techniques for preparing accounts in different business organizations.

**UNIT – I**

Meaning of accounting – concepts & conventions, principles of Double entry – Journal and ledger accounts.

**UNIT – II**

Subsidiary books – purchase day book, sales day book, cash book, Analytical Petty cash book.

**UNIT -III**

Rectification of errors – Depreciation account (Fixed installment method – Written down value method)

**UNIT – IV**

Preparation of Final accounts – Trading account, profit and loss account – Balance sheet – adjusting and closing entries (simple problems only).

**UNIT – V**

Computer Accounting and Algorithm – Areas of application of computer in Accounting –features and advantages of computers and computer accounting Algorithm, Requisites of an effective Algorithm. Features of Algorithm.

**Theory 30 Marks & Problem 45**

**MarksBooks Recommended:**

1. **Financial Accounting - T.S. Reddy and V. Murthy – Margham Publications.**
2. **Financial Accounting – B. Charumathy and L. Vinagayam – S. Chand & Company.**
3. **“Advanced Accountancy” by Jain & Narang, KALYANI Publishers, New Delhi.**

**Books for reference:**



1. *Advanced Accountancy – M.C. Shukla T.S. Gerwal & Sculpture Gupta – S. Chand & co.,*
2. *Fundamentals of Advanced Accounting – Volume I Pillai and Bagavathy S. Chand & co.,*

**Semester III**

**Hours/Week: 2**

**U22SBE2C Skill Based Elective II – Java Script & PHP Credit: 2**

**COURSE OBJECTIVES**

- *The course is designed to provide an general study of the Javascript programming.*
- *This course is accentuated the strengths of Javascript which provides students to write a program efficiently.*
- *This course is offered to design the wide variety of examples and applications in ASP.*
- *This course is emphasized to learn some other scripting programming languages.*

**COURSE OUTCOME**

*Upon successful completion of this course, students will be able to CO1:*

*Understand the Introduction to Javascript.*

*CO2: Develop knowledge to write Javascript program.*

*CO3: Explain variables, functions, objects and other features of Javascript*

*CO4: Understand different concepts of Windows and frames.*

*CO5: Demonstrate the control in a form and validate the inputs.*

*CO6: Illustrate the concepts PHP.*

*CO7: Understand the Variables, Constants and Control structures.*

**UNIT – I**

*Introduction to Java Script: JavaScript’s Role on the Web – A First JavaScript Program – Working with Variables, Functions: Variables – Defining Functions – Calling Functions – Understanding JavaScript Objects – Object Methods – Variable Scope*

**UNIT – II**

*Windows: The Window Object Model – Opening and closing Windows – Frames and Other Objects: Creating Frames – Using the TARGET Attribute – Nesting Frames – The NOFRAMES Tag*

*Forms: Overview of Forms – The <FORM> Tag – Form Elements: Input Fields – SelectionLists – Multiline Text Fields – Validating a User’s Input to a Form*

**UNIT – IV**

*PHP: Server side scripting Language: Basic syntax – Types – Variables – Constants – Expressions – Operators – Control Structures*

**UNIT – V**

*Classes and Objects – Sessions - Cookies.*

**Text Book:**

1. Don Gosselin, “JavaScript Comprehensive” – Vikas Publishing house.

*UNIT I: CHAPTER 1& 2 UNIT II: CHAPTER 5 UNIT III: CHAPTER 6*

2. Steven Holzner “The PHP Complete Reference 5.2” – Tata McGraw – Hill Edition.

*UNIT IV: Chapter 1(Sec 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7), Chapter 2*

*UNIT V: Chapter 4(Sec 4.1, 4.2, 4.3, 4.4)*

**Reference Books:**

1. Steve Suehring, “JavaScript Step by Step”, 2nd Edition, Microsoft Corporation

2. Ivan Bayross, *HTML, DHTML, Java Script, Perl, CGI,BPB, Third Revis.*
3. Steven Holzer “*Spring into PHP5*”, Tata McCraw Hill Edition.

**Semester III**

**Hours/Week: 2**

**U22SBE3CP**

**Credit: 2**

***Skill Based Elective III - HTML, Java Script and PHP Lab***

**COURSE OBJECTIVES**

- *The course is given hands-on experience on HTML, Javascript and ASP and improves the practical skill set.*
- *This course is established the beginners to build understand the Structure of Scripting Languages.*

**COURSE OUTCOMES**

*CO1: Upon successful completion of this lab Course, student will be able to CO2: Understand the fundamentals of HTML program.*

*CO3: Develop knowledge to write and view the output of the HTML program. CO4: Use the role of function, frames and validation in Javascript.*

*CO5: Understand the concept of PHP and write and view the simple examples.*

**HTML Lab**

1. (a) *Creation of Vertical Frameset.*  
(b) *Creation of Horizontal Frameset.*
2. *Sending Mail.*
3. *Insertion of Image.*
4. *Application form Creation.*
5. *Creating an Advertisement for a Company.*

**Java Script Lab**

1. *Functions.*
2. *Frames.*
3. *Validation.*

**PHP**

1. *Develop a PHP program using controls and functions.*
2. *Develop a PHP program using session.*
3. *Develop a PHP program using cookies.*

**SEMESTER - IV**

**Hours/Week:4**

**Core Course : U22IT7DATA STRUCTURES AND ALGORITHMS Credit: 4**

**COURSE OBJECTIVES**

- To get a clear understanding of object-oriented concepts through C++.
- To design and implementation of various basic and advanced data structures.

**COURSE OUTCOMES**

*Upon successful completion of this course, Student will be able to*

*CO1: Gain the basic knowledge on Object Oriented concepts.*

*CO2: Develop applications using Object Oriented Programming Concepts*

*CO3: Explain class structures as fundamental, modular building blocks*

*CO4: Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.*

*CO5: To learn how to implement constructors and class member functions.*

**Unit I:**

*Arrays and sequential representations – ordered lists – Stacks and Queues –Evaluation of Expressions – Multiple Stacks and Queues – Singly Linked List –Linked Stacks and queues –Polynomial addition.*

**Unit II:**

*Trees – Binary tree representations – Tree Traversal – Threaded Binary Trees –Binary Tree Representation of Trees – Graphs and Representations –Traversals, ConnectedComponents and Spanning Trees – Shortest Paths and Transitive closure .*

**Unit III:**

*Algorithms – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort –BinarySearch – Finding the Maximum and Minimum.*

**Unit IV:**

*Greedy Method : The General Method – Optimal Storage on Tapes – Knapsack Problem –Job Sequencing with Deadlines – Optimal Merge Patterns.*

**Unit V:**

*Back tracking: The General Method – The 8-Queens Problem – Sum of Subsets – GraphColoring.*

**Text Books:**

1. *Fundamentals of Data Structure – Ellis Horowitz, SartajSahni, Galgotia Publications, 2008*

2. *Computer Algorithms – Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, University Press, 2008.*

**Reference Book:**

1. *Data Structures – Seymour Lipschutz, Tata Mcgraw Hill, Schaum's Outline Series, 2014*

**Semester II**

**Core Course (U22IT8P)**

**DATA STRUCTURE LAB**

**Hours/Week: 2**

**Credit: 3**

**COURSE OBJECTIVE**

- To provide hands-on for C++ & DS programs using C++ language

**COURSE OUTCOMES**

Upon successful completion of this course, Student will be able to

CO1 Tell about the object oriented concepts

CO2 Discuss the execution of the C++ program using control structures, classes and objects

CO3 Demonstrate constructor, Operator Overloading and Inheritance

CO4 Introduce the concept of data structures including List, Stack, Queues.

CO5 To develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion and deletion

CO6 Demonstrate a thorough understanding of arrays by designing and implementing programs that search and sort arrays.

**Program to implement the following concepts**

1. Class and object
2. Functions using
  - (i) Call by value
  - (ii) Call by reference
  - (iii) Recursive call
3. Constructor and its types
4. Operator Overloading
5. Inheritance
6. To perform Stack operation using Array
7. To perform Queue operation using Array
8. To Create, Insert & Delete a Node using Singly Linked List
9. To find an element using Linear Search and Binary search.
10. To find an element using.

11. To perform the following Sorting:

(i) Bubble sort

(ii) Quick sort.

(iii) Selection sort.

**Semester IV**

**Allied Paper II**

**Hours/Week:**

**4**

**U22ACO2ITTP**

**Accounting Package Theory & Lab**

**Credit: 3**

**COURSE OBJECTIVE**

- This course introduces to teach basic concepts of Financial Accounting
- This course offered the use a good Financial Accounting Software.

**COURSE OUTCOMES**

*Upon successful completion of this lab Course, student will be able to*

*CO1: Appreciate the need for negotiable instruments and procedure of accounting for bills*

*honoured and dishonoured*

*CO2: Differentiate Trade bills from Accommodation Bills*

*CO3: Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment*

*CO4: Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture*

*CO5: Distinguish between Single Entry and Double Entry*

*CO6: Know the ascertainment of profit under Single Entry system.*

*CO7: Understand the meaning and features of Non-Profit Organisations*

*CO8: Learn to prepare Receipts & Payment Account, Income & Expenditure Account and*

*Balance Sheet for Non-Profit Organizations.*

**UNIT I**

*Fundamentals of Computerized Accounting – Principles of Accounting - Computerized Accounting Vs Manual Accounting - Features of Tally – Starting Tally.*

**UNIT II**

*Classification of Accounts –Introduction – Groups – Primary groups – Vouchers - Types of vouchers - Payment voucher-Receipt Voucher-Sales Voucher-Purchase Vouchers.*

**UNIT III**

*Inventory master creation : Creating inventory masters – Creating a stock group - Creating a Godown - Creating a unit of measurement - Creating a stock item.*

#### **UNIT IV**

*Introduction - Basic concepts of TDS - TDS in Tally ERP 9 – Setup - TDS statutory masters- TDS reports.*

#### **UNIT V**

*Introduction to GST - Enabling GST and defining Tax details - Transferring input Tax credit to GST - Intrastate supply of Goods - Interstate supply - Return of goods - Outward supply of services - GST reports.*

#### **Text Books:**

1. *Computer Application in Business –K. Mohan kumar, Dr.Rajkumar* Unit 1: chapter 1 & 5
2. *Tally-Accounting software –S.Palanivel - Margham publications.* Unit 2: chapter 4 & 5
3. *Tally ERP 9 with GST, BPB Publications.*  
Unit 3: chapter 7(7.5.1 to 7.5.5)  
Unit 4: chapter 7(7.18 to 7.22, 7.26) Unit 5: chapter 7(7.33 to 7.40)

#### **List of Exercises**

- 1 *Trial Balance*
- 2 *Stock Creation*
- 3 *Voucher Creation*
- 4 *Payslip Preparation*
- 5 *TDS (Tax Deducted Sources)*
- 6 *GST (Goods and Service Tax)*
7. *Purchase Entry*
- 8 *Sales Entry*
- 9 *Accounting Package*



**Semester IV**  
**Core Course**  
**(U22ACO3IT)**

**Allied Paper III**  
**ENTERPRISE RESOURCE**  
**PLANNING**

**Hours/Week: 4**  
**Credit: 3**

**Course Objective:**

To understand about ERP systems, ERP software and modules, Implementation of ERP, and Emerging trends on ERP.

**Course Outcome:**

- CO1 Enhanced Evaluation of ERP systems, Business Analytics, Future trends in ERP systems.
- CO2 Understand the Risks and benefits
- CO3 Know the Business process Management
- CO4 Learn the ERP implementation
- CO5 Understand the Industrial impact

**UNIT I INTRODUCTION**

Overview of enterprise systems – Evolution - Risks and benefits -Fundamental technology - Issues to be consider in planning design and implementation of cross functional integrated ERP systems

**UNIT II ERP SOLUTIONS AND FUNCTIONAL MODULES**

Overview of ERP software solutions- Small medium and large enterprise vendor solutions, BPR, Business Engineering and best Business practices - Business process Management. Overview of ERP modules -sales and Marketing, Accounting and Finance, Materials and Production management.

**UNIT III ERP IMPLEMENTATION** - Planning Evaluation and selection of ERP systems Implementation life cycle - ERP implementation, Methodology and Frame work Training – Data Migration. People Organization in implementation-Consultants, Vendors and Employees.

**UNIT IV POST IMPLEMENTATION** Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of and ERP Implementation

**UNIT V EMERGING TRENDS ON ERP** - Extended ERP systems and ERP add-ons -CRM, SCM, Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies so on.

**TEXT BOOKS:**

1. Alexis Leon, ERP demystified, second Edition Tata McGraw-Hill, 2007.

**REFERENCE BOOKS:**

1. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
2. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
3. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009.
4. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2nd edition, 2006.



**Semester IV**  
**(U22NMEN1)**  
**Course Objective**

**Basic Concepts of Computer Science**

**Hours/Week: 2**

**Credit: 2**

- *This course introduces the basic concepts of computer to the students who is notbelonging to Computer Science stream.*
- *This course will give the knowledge about Secondary Storage Devices.*
- *This course will stress on fundamental parts Internet and the intranet, so that the students will have a basic concept for understanding and using other programming language.*

**Course Outcome**

*Upon successful completion of this course, students will be able to*

- CO1 *Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.*
- CO2 *Explain the Secondary storage Devices and its types*
- CO3 *Demonstrate about the Software*
- CO4 *Understanding the basis of Data communication and computer Networks.*
- CO5 *Explain about Internet and WWW.*

**UNIT I:** *Introduction: Characteristics of Computers – The Evolution of Computers – The Computer Generations. Basic Computer Organization: Input Unit – Output Unit - Storage Unit – Arithmetic Logic Unit – Control Unit – The Central Processing Unit. Processor and Memory: The Main Memory.*

**UNIT II:** *Secondary Storage Devices: Sequential and Direct Access Devices – Magnetic Disk - Optical Disk – CD-ROM. Input-Output Devices: Input Devices: Keyboard – Point-and-Draw Devices – Data Scanning Devices – Electronic-card Reader. Output Devices: Monitors – Printers – Plotters. Computer Software: Types of Software.*

**UNIT III:** *Operating Systems: Main Functions of an Operating System. Business Data Processing: Data Processing – Data Storage Hierarchy – Standard Methods of Organizing Data – File Management System: File Types – File Organizations – Database Management System: Database Models.*

**UNIT IV:** *Data Communication and Computer Networks: Basic Elements of a Communication System – Data Transmission Modes – Data Transmission Speed – Data Transmission Media – Digital and Analog Data Transmission.*

**UNIT V:** *The Internet: Definition- Basic Services: Electronic Mail – File Transfer Protocol – Telnet - The World Wide Web. WWW Browsers – Uses of the Internet. Multimedia: Multimedia Computer System – Multimedia Components – Multimedia Applications.*

**Text Book:**

Pradeep K. Sinha and Priti Sinha, "Computer Fundamentals", BPB Publications, 3<sup>rd</sup> Edition.

Unit 1: chapter (1, 2)

Unit 2: chapter (8, 9, 10)

Unit 3: chapter (14, 16)

Unit 4: chapter (17)

Unit 5: chapter (18, 22)

**Reference Book:** V.Rajaraman and Neeharika Adabala, "Fundamentals of Computers", 6<sup>th</sup> Edition, PHI Learning Private Limited, 2014.



**Semester V**

**Hours/Week: 5**

**Core Course (U22IT9)**

**Programming in Java**

**Credit: 5**

### **COURSE OBJECTIVES**

*This course aims at facilitating the student to understand the Object-Oriented programming concepts of JAVA towards developing Java based applications and hands on practices by applying the concepts of Database Connectivity.*

#### **Course Outcomes**

*On the successful completion of the course, students will be able to*

*CO1: Explain the OOPs concept, Java tokens and operators and expression*

*CO2: Explain and implement classes and object, method overloading and overriding concept.*

*CO3: Describe Implements interfaces, use exceptions, threads, collections, logs of Java for the given problem.*

*CO4 Understand Concept of Thread, its life cycle and Thread Exception*

*CO5: Define various types of Errors and Apply Exception handling using multiple catch statement*

*CO6: Understand and describe concept of streams, reading and writing CO7:*

*Understand Applet, Life cycle of Applet and develop simple applet.*

#### **UNIT – I**

*Benefits of OOPS – Java History – Java Features – Java Environment – Java Tokens – Constants – Variables – Data Types – Operators and Expressions – Decision Making and Branching – Decision Making and Looping.*

#### **UNIT – II**

*Classes and Objects – Constructors – Method Overloading – Static Members – Inheritance – Overriding Methods – Final Variables, Final Methods and Final Classes – Finalizer Method – Abstract Methods and Abstract Classes – Visibility Control – Arrays – Strings.*

#### **UNIT – III**

*Defining Interface – Extending Interfaces – Implementing Interfaces – Packages – Multithreaded Programming: Thread Life Cycle – Thread Exceptions – Thread Priority – Synchronization.*

#### **UNIT – IV**

*Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statements – Managing Input / Output Files in Java: Concept of Streams – Stream Classes – Character Stream Classes – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Random Access files.*

#### **UNIT – V**

*Event Handling Methods – Labels – Button Control – CheckBox Control – Radio Button Control – Choice Control – List Control – Flow Layout – Border Layout – Grid Layout – Menus – Mouse Events – Applets: Life cycle of an Applet – Development and Execution of a Simple Applet.*

**Text Books:**

1. E.Balagurusamy, "Programming with JAVA", Tata McGraw Hill, New Delhi, 4<sup>th</sup> Edition. (UNIT I,II,III&IV)
2. C. Muthu, "Programming with JAVA", Vijay Nicole Imprints Private Limited, Chennai, 2<sup>rd</sup> Edition, 2011. (UNIT V)

UNIT I : Chapter 1 Sec.1.3,1.4 , Chapter 2 Sec. 2. 1, 2 .2 , 2 .9, Chapter 3 Sec 3.6, Chapter 4 Sec. 4.2 – 4.4,Chapter 5 Sec. 5.1 – 5.15,Chapter 6 Sec. 6.1 – 6.8,Chapter 7 Sec. 7.1 – 7.6.

UNIT II: Chapter 8 Sec. 8.5,8.7 to 8.9 ,8.11 – 8.16,8.18 Chapter 9 Sec. 9.1 – 9.9.

UNIT III:Chapter 10 Sec.10.2 – 10.5, Chapter 11,Sec. 11.1 – 11.10.Chapter 12 Sec. 12.5,12.7 – 12.9.

UNIT IV: Chapter 13 Sec. 13.1 – 13.6, Chapter 16 Sec. 16.2,16.3,16.5,16.11 – 16.13,16.15.

UNIT V: Chapter 9 Sections 9.4,9.6 – 9.11,9.13 – 9.15, Chapter 10 Sections 10.3,10.5,Chapter 8 Sections 8.2,8.4

**Reference Books:**

1. Herbert Schildt, "Complete Reference JAVA 2", Tata McGraw – Hill Publishing Company Ltd., 5<sup>th</sup> Edition, 2009

**Semester V**

**Hours/Week: 5**

**Core Course (U22IT10P) PROGRAMMING IN JAVA LAB Credit: 3**

**COURSE OBJECTIVE**

*This course aims at facilitating the student to practice and Implement the Object-Oriented programming concepts of JAVA towards developing Java based applications and hands on practices by applying the concepts of Database Connectivity.*

**COURSE OUTCOMES**

*On the successful completion of the course, students will be able to*CO1:

*Understand and implement the concept of class and objects.CO2: Write Java programs for string manipulation.*

*CO3: Implement packages, access specifiers and interfaces in a program*

*CO4: Implement Program for Events handling.*

*CO5: Generate program for implementing MultithreadingCO6:*

*Write programs using Applet and AWT*

*Write a java program using the concept*

- 1. Classes and Objects.*
- 2. Inheritance*
- 3. (a) Built-in package.*  
*(b) User defined package*
- 4. Vector Manipulation.*
- 5. Exception handling.*
- 6. Applet.*
- 7. Multi Threading.*
- 8. AWT components.*

**Semester V**

**Core Course (U22IT11)**

**COMPUTER NETWORKS**

**Hours/Week: 5**

**Credit: 5**

**COURSE OBJECTIVE:**

*The course aims to provide an understanding of computer networks concepts like Wired and Wireless Network, it also imparts knowledge about routing algorithm, DNS, WWW and E- mail technologies.*

**COURSE OUTCOMES:**

*On successful completion of the course, the students will be able to*

**CO1:** *Describe the uses of Computer Networks, and hardware and software needed for implementing Network*

**CO2:** *Explain and illustrate the layers in OSI reference model*

**CO3:** *Discuss the difference between guided transmission media and wireless transmission.*

**CO4:** *Use Error detection and correction and explain sliding window protocol*

**CO5:** *Use suitable routing algorithm and congestion control algorithm*

**CO6:** *Discuss about transport layer and elements of transport protocols.*

**CO7:** *Explain about DNS, E-mail and WWW*

**UNIT I:**

*Introduction: uses of computer networks - network hardware - network software - referencemodels - example networks - network standardization*

**UNIT II:**

*The physical layer: guided transmission media - wireless transmission – communication satellites – the public switched telephone network*

**UNIT III:**

*The data link layer: data link layer design issues - error detection and correction – elementary data link protocols - sliding window protocols*

**UNIT IV:**

*The network layer: network layer design issues - routing algorithms - congestion control algorithms- quality of service – internetworking*

**UNIT V:**

*The transport layer: the transport service - elements of transport protocols - a simple transport protocol the application layer: dns--domain name system - electronic mail – the World Wide Web*

**Text Book:**

*Andrew S. Tanenbaum “Computer Network”, 4<sup>th</sup> Edition  
,Prentice Hall.2006.*

*UNIT 1: CHAPTER 1(Sec 1.1, 1.2, 1.3, 1.4, 1.5, 1.6)*

*UNIT 2: CHAPTER 2(Sec 2.3, 2.4, 2.5)*

*UNIT 3: CHAPTER 3(Sec 3.1, 3.2, 3.3, 3.4)*

*UNIT 4: CHAPTER 5(Sec 5.1, 5.2,5.3, 5.4,5.5)*

*UNIT 5: CHAPTER 6(Sec 6.1,6.2,6.3,7.1,7.2,7.3)*

**Reference Book:**

- 1.Forouzan “Computer Networks”,Tata McGraw-Hill Education, 2012.
2. William Stallings, “Data and Computer Communications”, 6 th Edition, PrenticeHall of India,2002.





**Semester V**  
**Elective Course (U22IT12E)    COMPUTER GRAPHICS**  
**COURSE OBJECTIVES**

**Hours/Week: 5**  
**Credit: 5**

*The course aims to provide the basic knowledge of Computer Graphics and its*

*application, it also impart knowledge on two dimensional transformation and various clipping concepts.*

**Course Outcomes**

*On successful completion of the course, the students will be able to*

*CO1: Describe the basics of Computer Graphics, input and hard copy device and graphics software*

*CO2: Explain about RasterScan and Random Scan system*

*CO3: Explain and illustrate the various algorithms like line drawing, DDA, Bresenham's etc*

*CO4: discuss about various attributes of output primitives like line attribute, AreaFill, Character fill*

*CO5: Illustrate 2D Geometric Transformations and Explain Matrix*

*representation CO6: Describe and illustrate Clipping Operations like Line clipping, polygon clipping.*

*CO7: Discuss about window to viewport coordinate and 2D viewing functions.*

**UNIT I:**

*A survey of computer graphics: Computer aided design – Presentation graphics computer art – Entertainment – Education and training – Visualization – Image Processing – Graphical user interfaces. Overview of graphics systems: Video display devices – Raster- scan systems – Random scan systems – Graphics monitors and workstation – Input devices – Hard-copy devices – Graphics software.*

**UNIT II:**

*Output primitives: Points and lines – Line-drawing algorithms – DDA algorithm – Bresenham's line algorithm – Circle-generating algorithms – Filled-area primitives – Boundary-fill algorithm.*

**UNIT III:**

*Attributes of output primitives: Line attributes – Area-fill attributes – Character attributes – Bundled attributes – Inquiry functions – Antialiasing*

**UNIT IV:**

*Two-dimensional Geometric transformations: Basic transformations – Matrix representations – Composite transformations – Other transformations.*

**UNIT V:**

*Window-to-viewport coordinate – Two-dimensional viewing functions – Clipping operations – Point clipping – Line clipping – Polygon clipping.*

**Text Book:**

*Donald Hearn and M. Pauline Baker “Computer Graphics” C Version 2 nd Edition, - Pearson Education, 2006.*

*Unit 1: chapter 1(sec 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8)*

*chapter 2(sec 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)*

*Unit 2: chapter 3(sec 3.1, 3.2, 3.5, 3.11)*

*Unit 3: chapter 4(sec 4.1, 4.4, 4.5, 4.6, 4.7, 4.8)*

*Unit 4: chapter 5(sec 5.1, 5.2, 5.3, 5.4)*

*Unit 5: chapter 6(sec 6.4, 6.5, 6.6, 6.7, 6.8)*

**Reference Book:**

1. Jeffrey J. McConnell,” Computer Graphics: Theory Into Practice”, Jones and barlett publishers, 2006.
2. Peter Shirley, Michael Ashikhmin, Steve Marschner ”Fundamentals of Computer Graphics”, CRC Press, 2009.



**Semester V**  
**Elective Course (U22IT12E)**

**Hours/Week: 5**  
**Credit: 5**

## **PRINCIPLES OF ANIMATION**

### **COURSE OBJECTIVE**

*This course is designed to provide an overview of History of animation. It also enables the student to get a detailed knowledge on fundamentals of animation from traditional animation to CGI animation.*

### **COURSE OUTCOMES**

*On the successful completion of the course, students will be able to CO1:*

*Explain the basic of animation and its history*

*CO2: Explain the Basic rules and principles of animation*

*CO3: Describe about various timing for animation and also the use of camera angles CO4:*

*Describe about Animation production process in detail*

*CO5: Understand and apply basic traditional animation*

*CO6: Implementation of sample animations like Bouncing ball etc., **Unit-I***

*Introduction to Animation & History of Animation: What is Animation, History of Animation – Starting from Early approaches to motion in art, Animation before film, Traditional Animation – The silent era, Walt Disney & Warner Bros., Snow White & the seven dwarfs, The Television era, Stop-motion, CGI Animation - till date. Different Types of Animation: Traditional Animation - Cel Animation or hand drawn Animation - Stop Motion Animation – Puppet Animation, Clay Animation, Cut-out Animation, Silhouette Animation, Model Animation, Object Animation etc. - Computer Animation – 2D Animation, 3D Animation*

### **Unit-II**

*The 12 basic Principles of Animation: The basic rules of animation including Squash and stretch, Anticipation, Staging, Straight Ahead Action and Pose to Pose, Follow Through and Overlapping Action, Slow In and Slow Out, Arc, Secondary Action, Timing, Exaggeration, Solid drawing, Appeal*

### **Unit-III**

*Timing for Animation: Ease in & Ease out, X-Sheet handling, Field Chart usage, Camera Panning, Zoom-in & Zoom-out, Cut-shot, Dissolve transform, trick shot, hook-up shot etc. How to create hook-up poses for animation. How to use camera angles to emphasize performance*

### **Unit-IV**

*Animation Production Process: Understand Animation Requirements, Basic steps in Pre- Production, Production and Post-Production.*

### **Unit-V**

*Basic Traditional Animation Samples: To apply the principles of animation, Posing and Character emotion. How to observe and study human behavior and expressions to help visualize concepts. How to enact and emote. Sample animations - Bouncing Ball Animation, Walk Cycle, Run Cycle, 4 Leg Walk cycle, Fly Cycle.*

***Text Books and Reference Books:***

1. *The Illusion of Life: Disney Animation* - Frank Thomas and Ollie Johnston
2. *Cartoon Animation* - Preston Blair
3. *The Animators Survival Kit* - Richard Williams

***Online References***

History of Animation - [https://en.wikipedia.org/wiki/History\\_of\\_animation](https://en.wikipedia.org/wiki/History_of_animation)

Principles of Animation - [https://en.wikipedia.org/wiki/12\\_basic\\_principles\\_of\\_animation](https://en.wikipedia.org/wiki/12_basic_principles_of_animation) YouTube

Video: <https://www.youtube.com/watch?v=haa7n3UGyDc&feature=youtube>

**Semester V**  
**Elective Course (U22IT12E)**

**Visual Effects**

**Hours/Week: 5**  
**Credit: 5**

### **COURSE OBJECTIVE**

*This course is designed to provide an overview of Visual effects. It also enables the student to get a detailed knowledge on various visual effects tools and gives a clear knowledge on 2d and 3d effects.*

### **COURSE OUTCOMES**

*On the successful completion of the course, students will be able to CO1:*

*Explain the overview of visual effects, 3D modeling*

*CO2: Describe various tracking and cloning effects CO3:*

*Understand and implement the various effects CO4*

*Describe about 3D stereo effects in detail*

*CO5: Differentiate anaglyph and polarised*

*CO6: Implementation of image conversion from 2D to 3D CO7:*

*Differentiate 2D and 3D*

#### **Unit – I**

*Visual effect overview, image animation, 3d tools converting, Controlling timeline panels, Visual effect making, 3d model compositing, Designing Glow Effects*

#### **Unit – II**

*Tracking, one point track, two point track, Four point track, Double tracking, Paint Clone effect, Wire remove effect, Sky replace effect, background changing effect, Masking, Rotoscoping, 3D character masking.*

#### **Unit - III**

*Bug effect, Healer effect, Time warp effect, Time Stretching effect, Image to video effect, Day to night effect, Demon face warp, 3D depth effect*

#### **Unit - IV**

*3D stereo effect, 3d stereo convert effect, 3D glass making, Different between anaglyph; polarised, Change 3d stereo in premier software*

#### **Unit – V**

*Visual Effects Tool and advanced functions– Converting images from 2D to 3D Pictures. Creating 3D Effects- Differentiation 2D effects and 3D effects.*

### **Text Books and Reference Books:**

- 1. Match moving: The Invisible Art of Camera Tracking by Tim Dobbert. Tim Dobbert (Author)*
- 2. The After Effects Illusionist: All the Effects in One Complete Guide by Chad Perkins .Chad Perkins*
- 3. The Visual Effects Arsenal: VFX Solutions for the Independent Filmmaker by Bill Byrne .Bill Byrne*
- 4. After Effects Expressions by Marcus Geduld Marcus. Geduld (Author)*
- 5. Filming the Fantastic: A Guide to Visual Effects Cinematography by Mark Sawicki . Mark Sawicki*

**SEMESTER - V**  
**Elective Course-U22IT13E**

**Hours/Week:5**  
**Credit: 4**

**PC Hardware and Trouble shooting**

**COURSE OBJECTIVES:**

*This course is designed to enable the student to get a detailed knowledge of all the hardware components that makes up a computer and to understand the different interfaces required for connecting these hardware devices.*

**Course Outcomes**

*On the successful completion of the course, students will be able to*

**CO1:** Explain the Hardware components and architecture Understand

**CO2:** Explain the classification of Memory, Keyboard and mouse Understand

**CO3:** Describe about various troubleshooting mechanism like BIOS,  
CD-Drive's, CMOS, etc. Apply

**CO4:** Describe about various troubleshooting mechanism like Keyboard,  
Memory, Pointing device, Motherboard etc. Understand

**CO5:** Explain about Power protection devices and Power supply management Understand

Understand

**CO6:** Understand and Describe Installation process of Network/ modem Apply

**CO7:** Understand and Apply installation of Peripheral devices Apply

**UNIT I**

*Introduction to Computer Hardware – Main System Unit - The Motherboard -  
Motherboard Components – #The Motherboard# – Architecture - Chipsets-  
Connectors on the Motherboard – The Processor/CPU – Architecture - Modern  
Microprocessors - Printer- Printer types - Hard Disk Drive- Floppy Disk Drive -  
CD-ROM Drive - DVD-Drive – Monitor – Monitor types – MODEM - Scanner.*

**UNIT II**

*Memory : Memory – Primary Memory – Secondary Memory – Bits & Byte – RAM – ROM*

*– Parity – ECC Memory – Physical Memory Organization – Memory Speed – Motherboard Memory Capacity – Extended Memory – BIOS - Keyboard – Keyboard Switch – Keyboard Organization – Keyboard Type – Mouse – Mouse Type – #Connecting Mouse# – Mouse Resolution – Add on cards and its types.*

### **UNIT III**

*Backup Troubleshooting - BIOS Upgrade Troubleshooting - Troubleshooting CD Drives - CMOS Maintenance and Troubleshooting - Troubleshooting CPU Problems - Troubleshooting a Drive Adapter - Troubleshooting DVD Drives - Troubleshooting Cooling Problems - Floppy Drive and HDD Troubleshooting.*

### **UNIT IV**

*Keyboard Maintenance and Troubleshooting - Memory Troubleshooting - Troubleshooting Pointing Devices - Motherboard Troubleshooting - #Parallel Port Troubleshooting# - Plug-and-Play Configuration and Troubleshooting.*

### **UNIT V**

*Troubleshooting Power Protection Devices - Troubleshooting Power Supplies and Power Management - #Troubleshooting the SCSI System# - Troubleshooting Sound Boards and Video Adapters. Installing Speakers/Headphones - Installing the Operating System -Removal and Replacement Procedures - #Upgrading PC Components# - Installing PC Peripherals - Installing Network/Modem Connections.*

### **Text Books**

1. Manohar Lotia, Pradeep Nair, Payal Lotia, Modern Computer Hardware Course, BPB Publications, Second Revised Edition, 2006.

**UNIT I :** Chapter I, II, III

**UNIT II:** Chapter IV

2. Stephen J. Bigelow, PC Troubleshooting & Repair - The Ultimate Reference, Dreamtech, Second Edition, Reprint, 2004.

**UNIT III:** Chapter 4, Chapter 6, Chapter 8, Chapter 10, Chapter 12, Chapter 14, Chapter 15 , Chapter 18 , Chapter 19, Chapter 20

**UNIT IV :** Chapter 22 , Chapter 23, Chapter 24, Chapter 26, Chapter 27, Chapter 28

**UNIT V :** Chapter 29 , Chapter 30, Chapter 32, Chapter 34, Chapter 35). Chapter 14, Chapter 8 ( A+ Complete Reference)

### **Books for Reference**

1. David Groth-Sybex, A+ Complete Study Guide, Third Edition, 1999.



**SEMESTER - V**  
**Elective Course-U22IT13E**

**Hours/Week:5**  
**Credit: 4**

**SOFTWARE ANALYSIS AND DESIGN**

**COURSE OBJECTIVE**

*This course is designed to enable the student to identify the information and need of the system. It also enables the student to get a detailed knowledge on various System design factors and tools. It gives a clear knowledge of Design Phases and System Applications.*

**COURSE OUTCOMES**

*On the successful completion of the course, the students will be able to*CO1:

*Explain the need of the system to the Business organization*CO2:

*Understand the Applications of System in Business*

*CO3: Explain the process of Designing techniques*CO4:

*Describe the various Design Tools*

*CO5: Describe the file structure and its organization*

*CO6: Explain the security measures*

*CO7: Understand and Describe the Installation and Maintenance of the System*

**Unit I**

*Business Problem & Computers: Overview of Business Organization – Information needs & systems –Some typical problems – System life cycle – System study – Feasibility Study*

**Unit II**

*System Analysis – Initiation of Analysis – The Process of Analysis – System Design –Design factors –Design Constraints – Processing Techniques – The Process of design – Output Design – input Design – Process Design – File Data Base Design*

**Unit III**

*Analysis & Design Tools – Data Flow Diagram – Data Dictionary – Entity Relationship Diagram – Decision Tree – Decision Table – Structured English – Structure Charts – Grid Charts – Layout Charts – Configuration Selection & Acquisition – Detailing the configuration – Storage requirements – Internal Memory – Processors – Terminals – printers*

**Unit IV**

*File Organization & Design: Functional Classification of Files – File Structure – File Organization – Inverted File – Security & Controls – Risk management – Physical Security – Access Control – Data Control – Other Security & control measures*

**Unit V**

*Post – Design phases – Develop Software – Installation & Changes-over-System Operation & maintenance – Systems Applications – Financial Accounting – Inventory Accounting System – Equipment Maintenance – Bank Operations – Production Planning & control – Process Control –Robotics*

**Text Book:**

*1. System Analysis & Business Applications – Rajesh Nalk & Swapna Kishore, Wheeler Publishing – 1st edition 2294.*

**Reference Book:**

*1. Introducing Systems Analysis & Design – Ellas M. Awad – Galgotia Publications (P) Ltd., 2<sup>nd</sup> Edition*

## **Object Oriented Analysis & Design**

### **COURSE OBJECTIVES:**

- *To learn the basics of OO analysis and design skills.*
- *To learn the UML design diagrams.*
- *To learn to map design to code.*
- *To be exposed to the various testing techniques.*

### **COURSE OUTCOMES:**

- CO1:Design and implement projects using OO concepts.CO2:  
Use the UML analysis and design diagrams.  
CO3: Apply appropriate design patterns.  
CO4: Create code from design.  
CO5: Compare and contrast various testing techniques.*

### **UNIT-I**

*Structured approach to system construction: SSADM/SADT - An overview of object oriented systems development & Life cycle.*

### **UNIT-II**

*Various object oriented methodologies – Introduction to UML.*

### **UNIT-III**

*Object oriented analysis – Use cases- Object classification, relationships, attributes, methods*

### **UNIT-IV**

*Object oriented design – Design axioms – Designing classes – Layering the software design :- data access layer, User interface layer, Control/business logic layer*

### **UNIT-V**

*UML - Examples on: Behavioural models – Structural models – Architectural models from real world problems.*

### **TEXT BOOK:**

1. Bahrami Ali, *Object oriented systems development*, Irwin McGrawHill, 2005 (First 4 units covered here).
2. Booch Grady, Rumbaugh James, Jacobson Ivar, *The Unified Modeling language – User Guide*,

Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

**Semester V      INTRODUCTION TO ICT**  
**Non- Major Elective**  
**(U22NMCS2)**

**Hours/Week:2**

**Credit: 2**

**Course Objective:**

- The objective of this course is to provide students with opportunities to learn new concepts in the area of Information and Communication Technologies (ICT) and keep up to date on the latest research and developments in the field.

**Course Outcome**

*Upon successful completion of this course, students will be able to*

- CO1**    *Understanding the progress of information and communication technologies (ICT) and their role in modern world*
- CO2**    *Knowing about the social media and community radio in online*
- CO3**    *Searching information on the Internet*
- CO4**    *Understanding the basis of Data communication and computer Networks.*
- CO5**    *Explaining the usage of computers in various fields.*

**UNIT I :** *ICT – Concepts, Objectives, Need and Importance of ICT – Characteristics and Scope of ICT – Recent Trends in the area of ICT – Interactive Video – Interactive White Board – Video Conferencing – M-Learning*

**UNIT II :** *Social Media – Community Radio – GyanDarshan – Gyanvani – Sakshat Portal – e- Gyankosh – Blog – MOCC – WhatsApp, Facebook, Twitter*

**UNIT III :** *Introduction – History of the Internet – Understanding WWW – Web Browsers – Favourites and bookmarks – Kinds of information available – Parts of Internet – Searching the net – Researching on the net*

**UNIT IV :** *Introduction – Overview of a Network – Communication Processors – Communication Media – Types of Networks – Network Topologies – Network Architecture – Communication Satellites – Radar – Fiber Optics – ISDN*

**UNIT V :** *Computers in Business and Industry – Computers in Home – Computers in Education and Training – Computers in Entertainment, Science, Medicine and Engineering*

**Text Books:**

1. G. Kavitha, Information and Communication Technology in Education, Saradha Publication, Chennai UNIT I : Chapters 1.1, 1.1.1, 1.1.2, 1.1.3, 2.1 – 2.5

*UNIT II : Chapters 2.6, 2.7.1 – 2.7.9*

*UNIT III : Chapters 6.1 – 6.9*

2. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, Vikas Publishing House Pvt Ltd, 2009

*UNIT IV : Chapters 18.1 – 18.4, 18.7, 18.8, 18.11, 19.6, 19.9, 19.11, 19.12*

*UNIT V : Chapters 33, 34, 35, 36*

**Reference Book:** A. Kumar, Internet and IT, Anmol Publications Pvt Ltd, First Edition,

2002 Unit 3: chapter (14, 16)

Unit 4: chapter (17) Unit 5: chapter (18, 19)

**Semester VI**

**Core Course (U22IT14)**

**Operating System**

**Hours/Week: 6**

**Credit: 5**

**Course Objective**

To learn the fundamentals of Operating Systems - To gain knowledge on Distributed operating system concepts that includes architecture, Mutual exclusion algorithms, Deadlock detection algorithms and agreement protocols - To gain insight on to the distributed resource management components

**Course Outcomes**

- CO1** Master functions, structures and history of operating systems
- CO2** Master understanding of design issues associated with operating systems
- CO3** Master various process management concepts including scheduling, synchronization,
- CO4** deadlocks
- CO5** Be familiar with multithreading
- CO6** Master concepts of memory management including virtual memory
- CO7** Master system resources sharing among the users
- CO8** Master issues related to file system interface and implementation, disk management
- CO9** Be familiar with protection and security mechanisms
- CO10** Be familiar with various types of operating systems including Unix

**UNIT – I**

Evolution of operating systems– Functions – Different views of OS – Batch processing, Multiprocessing, Time sharing OS – I / O programming concepts – Interrupt Structure & processing

**UNIT – II**

Memory Management – Single Contiguous Allocation – Partitioned Allocation – Relocatable Partitions allocations – Paged and Demand paged Memory Management – Segmented Memory-Management – Segmented and Demand paged Memory Management – overlay Techniques –Swapping

**UNIT – III**

Processor Management – Job Scheduling – Process Scheduling – Functions and Policies – Evolution of Round Robin Multiprogramming Performance – Process Synchronisation– Wait and Signal mechanisms – Semaphores P & V Operations – Deadlock – Banker’s Algorithm.

**UNIT – IV**

I/O Traffic Controller, I/O Scheduler, I/O Device Handlers – Spooling.

**UNIT – V**

File Management : Simple File System, General Model of a File System, Physical and Logical File System.

**Text Book:**

1.E. Madnick & John J. Donavan, “Operating Systems” Tata McGraw Hill Publishing

Co., Limited. 2. Pradeep K. Sinha, ”Distributed Operating Systems”, Prentice – Hall of India

Private Limited UNIT I : Chapter 1, 2 UNIT II : Chapter 3 UNIT III : Chapter 4

UNIT IV : Chapter 5 UNIT V : Chapter 6

**Reference Books:**

D.M. Dhamdhere, "System Programming and Operating Systems" Tata McGraw Hill Publishing Co., Limited.



**Semester VI**

**Core Course (U22IT15)**

**PYTHON PROGRAMMING**

**Hours/Week: 6**

**Credit:5**

**COURSE OBJECTIVE**

*The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.*

**COURSE OUTCOMES**

*Problem solving and programming capability*

*CO1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python*

*CO2. Express different Decision Making statements and Functions*

*CO3. Understand and summarize different File handling operations*

*CO4 Design and develop Client Server network applications using Python*

*CO5 Understand the GUI Programming with TKinter*

**UNIT I**

*Welcome to Python - What is Python – History of Python – Features of Python – Installing Python – Running Python - Comments - Operators - Variables and Assignment - Python Objects – Standard Types - Other Built-in Types - Internal Types - Standard Type Operators - Standard Type Built-in Functions - Categorizing the Standard Types - Unsupported Types*

**UNIT II**

*Introduction to Numbers – Integers - Floating Point Real Numbers - Complex Numbers – Operators - Built-in Functions - Sequences – Strings - Strings and Operators - String-only Operators - Built-in Functions - String Built-in Methods - Special Features of Strings*

**UNIT III**

*Lists – Operators - Built-in Functions - List Type Built-in Methods - Special Features of Lists - Tuples - Tuple Operators and Built-in Functions - Special Features of Tuples - Conditionals and Loops – if statement - else statement - else if statement - while statement - for statement - break statement - continue statement - pass statement - else statement*

**UNIT IV**

*Regular Expressions – Introduction – Special symbols and characters for Regular Expressions – Regular Expressions and Python – Network Programming – Introduction – Network programming in Python – Sockets : Communication end points*

**UNIT V**

*GUI Programming with TKinter – Introduction TKinter and Python Programming – Tkinter examples – Related modules and other GUIs – Web programming – Web surfing with Python – Advanced web clients.*

**Text Books**

*1. Chun, J Wesley, CORE Python Programming, 2 nd Edition, Pearson, 2007 Reprint 2010. UNIT*

*I : Chapter 1, 2, 4 UNIT II : Chapter 5, 6*

*UNIT III : Chapter 6, 8 UNIT IV : Chapter 15, 16 UNIT V : Chapter 18, 22*



## **Reference Book**

1. Jeffrey Elkner, Chris Meyers Allen Downey, *Learning with Python*, Dreamtech Press, 2015

**Semester VI**

**Core Course- U22IT16P PYTHON PROGRAMMING LAB**

**Hours/Week: 6**

**Credit : 5**

## **COURSE OBJECTIVE**

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

## **COURSE OUTCOMES**

- CO1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
- CO2. Express different Decision Making statements and Functions
- CO3. Understand and summarize different File handling operations
- CO4. Design and develop Client Server network applications using Python
- CO5. Understand the GUI Programming with Tkinter
- CO6. Problem solving and programming capability

## **List of Programs**

1. Write a python program to perform operation on :
  - a) List
  - b) Tuple
  - c) Dictionary
2. Write a python program using
  - a) Decision making statement
  - b) Looping statements
3. Write a Python program to implement using the concept of Regular Expression.
4. Write a Python program using 'calendar'.
5. Write a Python program to create applications using controls in 'Tkinter'

**Semester VI**  
**Core Course- U22IT17E Advanced Excel LAB**

**Hours/Week: 3**  
**Credit : 3**

**OBJECTIVES:**

➤ To understand the importance and advance concepts of Excel.

**Course Outcomes:**

On the successful completion of the course , students will be able to

CO1: Get the knowledge in advance Excel.

CO2: Understand the formulas in advance Excel.

CO3: Get the Knowledge about Nested ifs in advance Excel.

CO4: Understand the concepts of pivot able in advance Excel.

**Practical Exercises:**

1. Using nested IF functions
2. Understand the two ways to use VLOOKUP
3. Introduction top I vottables . Build a basic pi vottable
4. How to use IF,IF(AND),IF(OR)
- 5 .Advanced Filter to find a sub set of data

**Semester VI**  
**Elective Course (U22IT18) Software Engineering**

**Hours/Week: 3**  
**Credit: 3**

**Course Objective**

This course aims at introducing to the students about the product that is to be engineered and the process that provides a framework for the engineering technology. The course facilitates the students to analyze risk in software design and quality and to plan, design, develop and validate the software project.

**Course Outcomes**

On the successful completion of the course, students will be able to

CO1: Explain a process model for a software project development

CO2: Prepare the SRS, Design document, Project plan of a given software system

CO3: Apply Project Management and Requirement analysis, Principles to S/W project development.

CO4: Analyze the cost estimate and problem complexity using various estimation techniques

CO5: Generate test cases using the techniques involved in selecting:

- (a) White Box testing
- (b) Block Box testing

CO6: Explain the advantages of configuration management and risk management activities.

**UNIT I:** Introduction to Software Engineering: Definitions - Size factors – Quality and Productivity Factors – Managerial Issues. The Product: The evolving role of software – Software – characteristics - applications. The process: Software engineering: A Layered Technology – The software process – Evolutionary software process models: Spiral model.

**UNIT II:** Planning a Software Project: Defining the problem – Developing a solution Strategy – Planning the development Process – Planning an organizational structure – Other Planning Activities.

**UNIT III:** Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing Level Estimation. Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques.

**UNIT IV:** Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notation – Design techniques – Design Guidelines. Implementation Issues: Structured coding techniques – coding style – Documentation guidelines.

**UNIT V:** Verification and Validation Techniques: Quality Assurance – Walkthroughs and inspections – Static analysis – Unit testing and debugging – System testing – Formal verification.

**Text Books:**

1. Richard E. Fairley – “Software Engineering Concepts”, Tata McGraw Hill Publication, 1997 edition.

Unit 1: chapter 1(sec 1.1-1.4)      Unit 2: chapter 2(sec 2.1-2.5)

Unit 3: chapter 3(sec 3.1-3.4) chapter 4(sec 4.1-4.2)

Unit 4: chapter 5(sec 5.1-5.2, 5.9) chapter 6(sec 6.1, 6.2, 6.4)

Unit 5: chapter 8(sec 8.1-8.3, 8.5-8.7)

2. Roger S. Pressman – “Software Engineering A Practitioner’s Approach”, 5<sup>th</sup> edition, McGraw Hill, 2001.

UNIT 1: CHAPTER 1(Sec 1.1, 1.2)

**Reference book:**

1. Watts S. Humphrey – “A Discipline for Software Engineering”, Addison Wesley Company, 1995.

**Semester VI**

**Elective Course (U22IT18E)**

**INFORMATION SECURITY**

**Hours/Week: 5**

**Credit: 5**

**COURSE OBJECTIVE**

- To provide students with basic concepts in information system and the benefits with these systems in modern society
- To maintain and protecting information system

**COURSE OUTCOMES**

Upon successful completion of this course, the students would be able to

**CO1:** Gain comprehensive information about security policies, establishing necessary Organizational processes /functions for information security.

**CO2:** Explain web security threats and SSL architecture

**CO3:** Gain knowledge about Symmetric Encryption Principles and algorithms

**CO4:** Know the hash functions and public key cryptography principles

**CO5:** Identify the threats to information security and Show how to protect information resources

**CO6:** Demonstrate how to maintaining and protecting information system

**CO7:** Understand malicious software and have knowledge of cyber law and ethics.

**UNIT-I**

Introduction - Security Goals, OSI security architecture - Security Attacks - Security Services – Security mechanisms - A model for Internet network security – Standards.

**UNIT-II**

Symmetric Encryption and message confidentiality Symmetric Encryption Principles - Symmetric Algorithms -

*DES, AES and RC4 - Block Cipher Modes of Operation.*

**UNIT-III**

*Public key cryptography and message authentication Approaches to message authentication – Hash function requirements – simple hash functions – HMAC – public key cryptography principles – RSA – Diffie-hellman key exchange.*

**UNIT-IV**

*Transport-Level Security Web security threats - Web traffic security approaches – SSL architecture – SSL record protocol – Alert protocol – Handshake protocol, Transport Layer security.*

**UNIT-IV**

*E-mail security, malicious software, Firewalls E-mail security – PGP, S/MIME, IP security overview – Types of malicious software - Anatomy of Virus, Virus Counter Measures – Firewalls – need, characteristics, types.*

**TEXT BOOK**

1. William Stallings, *Network Security Essentials: Applications and Standards, Fourth edition, PHI.*
2. Mark Stamp, *Information Security Principles & Practice, WILEY INDIA 2006.*

**REFERENCE BOOKS**

1. Behrouz A. Forouzan, *Cryptography & Network Security, TMH 2007.*

2. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*, TMH
3. Wenbo Mao, *Modern Cryptography*, Pearson Education 2007.

**Semester VI**

**Hours/Week: 5**

**Elective Course (U22IT19E)**

**Credit: 5**

### **DIGITAL WATERMARKING AND STEGNOGRAPHY**

#### **COURSE OBJECTIVES**

- *Watermarking and Steganography are a valuable mechanism for protecting audio, video, and data and they are also becoming an important tool in facilitating e-commerce.*
- *The purpose of this course is to recognize and apply the digital watermarking and Steganography concepts as a protection tool for distribution of content over the Internet.*

#### **COURSE OUTCOMES:**

- CO1 *Upon completion of the course, students able to,*
- CO2 *Distinguish digital watermarking from other related fields. CO3*  
*Explain different types of watermarking applications.*
- CO4 *Discuss the various watermarking models.*
- CO5 *Describe digital watermarking systems in terms of imperceptibility, robustness, and watermark.*
- CO6 *Assess the digital watermark security and content authentication*

#### **UNIT I:**

*Introduction: Information Hiding, Steganography, and Watermarking, History of Watermarking and Steganography, Importance of Digital Watermarking, Importance of Steganography.*

#### **UNIT II:**

*Applications and Properties: Applications of Watermarking, Applications of Steganography, Properties of Watermarking Systems, Evaluating Watermarking Systems, Properties of Steganographic and Steganalysis Systems, Evaluating and Testing Steganographic Systems.*

#### **UNIT III:**

*Models of Watermarking: Notation, Communications, Communication-Based Models of Watermarking, Geometric Models of Watermarking, Modeling Watermark Detection by Correlation. Basic Message Coding: Mapping Messages into Message Vectors, Error Correction Coding, Detecting Multisymbol Watermarks.*

#### **UNIT IV:**

*Watermarking with Side Information: Informed Embedding, Embedding as an Optimization Problem, Watermarking Using Side Information Dirty-Paper Codes. Analyzing Errors: Message Errors, False Positive Errors, False Negative Errors, ROC Curves, the Effect of Whitening on Error Rates, Analysis of Normalized Correlation.*

#### **UNIT V:**

*Watermark Security: Security Requirements, Watermark Security and Cryptography,*

*Significant Known Attacks. Content Authentication: Exact Authentication, Selective Authentication, Localization, Restoration.*  
*Steganography: Steganographic Communication, Notation and Terminology, Information-Theoretic Foundations of Steganography.*

**Text Book**

1. Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom, Jessica Fridrich and TonKalker, “Digital Watermarking and Steganography”, *The Morgan Kaufmann Series in Multimedia Information and Systems*, 2nd Ed., 2008.

**REFERENCE BOOKS:**

1. Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom, —*Digital Watermarking*ll, Margan Kaufmann Publishers, New York, 2003.
2. Michael Arnold, Martin Schmucker, Stephen D. Wolthusen, —*Techniques and Applications of Digital Watermarking and Contest Protection*ll, Artech House, London, 2003.
3. JuergenSeits, —*Digital Watermarking for Digital Media*ll, IDEA Group Publisher, New York, 2005.
4. Peter Wayner, —*Disappearing Cryptography – Information Hiding: Steganography & Watermarking*ll, Morgan Kaufmann Publishers, New York, 2002.

## **CRYPTOGRAPHY**

### **COURSE OBJECTIVES**

- *To understand basics of Cryptography and Network Security.*
- *To be able to secure a message over insecure channel by various means.*
- *To learn about how to maintain the Confidentiality, Integrity and Availability of a data.*
- *To understand various protocols for network security to protect against the threats in the networks.*

### **COURSE OUTCOMES:**

*After successful completion of the course, the learners would be able to*

- CO1 Provide security of the data over the network.*
- CO2 Do research in the emerging areas of cryptography and network security.*
- CO3 Implement various networking protocols.*
- CO4 Protect any network from the threats in the world.*

### **Unit I**

*Overview-Symmetric Ciphers: Classical Encryption Techniques***Unit II**

*Symmetric Ciphers: Block ciphers and the Data Encryption Standards Public-key Encryption and Hash Functions: Public-Key Cryptography and RSA*

### **Unit III**

*Network Security Practices: Authentication applications-Electronic Mail Security***Unit IV**

*Network Security Practices: IP Security-Web Security***Unit**

### **V**

*System Security: Intruders-Malicious Software-Firewalls*

### **Text Book**

- 1. William Stallings, Cryptography and Network Security-Principles and Practices, Prentice-Hall, Third edition, 2003*

### **References**

- 1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.*
- 2. Atul kahate , Cryptography and Network Security, TMH.*