**ANNAMALAI UNIVERSITY**

**(Affiliated Colleges)**

**215 – B. Sc. Information Technology**

Programme Structure and Scheme of Examination (under CBCS)

(Applicable to the candidates admitted from the academic year 2023 -2024 onwards)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Part | Course Code | Study Components & Course Title | Credit | Hours/Week | Maximum Marks | | |
| CIA | ESE | Total |
|  |  | SEMESTER – I |  |  |  |  |  |
| I | 23UTAML11/  23UHINL11/  23UFREL11 | Language– I  nghJ jkpo; - I  Hindi-I/  French-I | 3 | 6 | 25 | 75 | 100 |
| II | 23UENGL12-I | General English – I | 3 | 6 | 25 | 75 | 100 |
| III | 23UINTC13 | Core – I: Programming in C | 5 | 5 | 25 | 75 | 100 |
| 23UINTP14 | Core – II : Practical – I : C Programming Practical | 5 | 5 | 25 | 75 | 100 |
| 23UMAFE15 | Elective – I: (Generic / Discipline Specific)  Mathematical Foundations – I | 3 | 4 | 25 | 75 | 100 |
| IV | 23UTAMB16  23UTAMA16 | Skill Enhancement Course-1 (NME-I) /\*  Basic Tamil – I /  Advanced Tamil – I | 2 | 2 | 25 | 75 | 100 |
| 23UINTF17 | Foundation Course:  Fundamentals of Computers | 2 | 2 | 25 | 75 | 100 |
|  |  | Total | 23 | 30 |  |  | 700 |
|  |  | SEMESTER – II |  |  |  |  |  |
| I | 23UTAML21/  23UHINL21/  23UFREL21 | Language– II  nghJ jkpo; - II  Hindi-II  French-II | 3 | 6 | 25 | 75 | 100 |
| II | 23UENGL22-II | General English – II | 3 | 6 | 25 | 75 | 100 |
| III | 23UINTC23 | Core –III: Java Programming | 5 | 5 | 25 | 75 | 100 |
| 23UINTP24 | Core – IV: Practical-II: Java Programming & Data Structures Practical | 5 | 5 | 25 | 75 | 100 |
| 23UMAFE25 | Elective - II (Generic / Discipline Specific) Mathematics Foundations – II | 3 | 4 | 25 | 75 | 100 |
| IV | 23UTAMB26  23UTAMA26 | Skill Enhancement Course – 2 (NME-II) /\*  Basic Tamil – II /  Advanced Tamil - II | 2 | 2 | 25 | 75 | 100 |
| 23USECG27 | Skill Enhancement Course – 3  Internet and its Applications  (Common Paper) | 2 | 2 | 25 | 75 | 100 |
|  |  | Total | 23 | 30 |  |  | 700 |

Non-major (NME) Electives offered to other Departments

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| IV | 23UINTN16 | Basics of Internet | 2 | 2 | 25 | 75 | 100 |
| 23UINTN26 | Fundamentals of Information Technology | 2 | 2 | 25 | 75 | 100 |

\* PART-IV: NME / Basic Tamil / Advanced Tamil (Any one)

Students who have not studied Tamil upto 12th Standardand have taken any Language other than Tamil in Part-I, must choose Basic Tamil-I in First Semester & Basic Tamil-II in Second Semester.

Students who have studied Tamil upto 10th & 12th Standardand have taken any Language other than Tamil in Part-I, must choose Advanced Tamil-I in First Semester and Advanced Tamil-II in Second Semester.

**FIRST YEAR – SEMESTER – I**

**CORE – I: PROGRAMMING IN C**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | | |
| **CIA** | **External** | | **Total** |
| **23UINTC13** | | **5** | 0 | 0 | I | **5** | **5** | **25** | **75** | | **100** |
| **Learning Objectives** | | | | | | | | | | | |
| **LO1** | To familiarize the students with the understanding of code organization | | | | | | | | | | |
| **LO2** | To improve the programming skills | | | | | | | | | | |
| **LO3** | Learning the basic programming constructs. | | | | | | | | | | |
| **Prerequisites:** | | | | | | | | | | | |
| **Unit** | **Contents** | | | | | | | | | **No. of Hours** | |
| I | **Studying Concepts of Programming Languages**- Language Evaluation Criteria - Language design - Language Categories - Implementation Methods – Programming Environments - Overview of C: History of C- Importance of C- Basic Structure of C Programs-Executing a C Program- Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations | | | | | | | | | **15** | |
| II | **Decision Making and Branching**: Decision Making and Looping - Arrays - Character Arrays and Strings | | | | | | | | | **15** | |
| III | **User Defined Functions:** Elements of User Defined Functions- Definition of Functions- Return Values and their Types- Function Call- Function Declaration- Categories of Functions- Nesting of Functions-Recursion | | | | | | | | | **15** | |
| IV | **Structures and Unions:** Introduction- Defining a Structure- Declaring Structure Variables Accessing Structure Members- Structure Initialization- Arrays of Structures- Arrays within Structures- Unions- Size of Structures. | | | | | | | | | **15** | |
| V | **Pointers:** Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initializing of Pointer Variables- Accessing a Variable through its Pointer- Chain of Pointers- Pointer Expressions- Pointer and Scale Factor- Pointer and Arrays- Pointers and Character Strings- Array of Pointers- Pointer as Function Arguments- Functions Returning Pointers- Pointers to Functions- **File Management in C** | | | | | | | | | **15** | |
| **TOTAL** | | | | | | | | | | **75** | |

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| **CO** | **Course Outcomes** |
| CO1 | Outline the fundamental concepts of C programming languages, and its features |
| CO2 | Demonstrate the programming methodology. |
| CO3 | Identify suitable programming constructs for problem solving. |
| CO4 | Select the appropriate data representation, control structures, functions and concepts based on the problem requirement. |
| CO5 | Evaluate the program performance by fixing the errors. |
| **Textbooks** | |
|  | Robert W. Sebesta, (2012), ―Concepts of Programming Languages‖, Fourth Edition,  Addison Wesley (Unit I : Chapter – 1) |
|  | E. Balaguruswamy, (2010), ―Programming in ANSI C‖, Fifth Edition, Tata McGraw Hill  Publications |
| **Reference Books** | |
|  | Ashok Kamthane, (2009), ―Programming with ANSI & Turbo C‖, Pearson Education |
|  | Byron Gottfried, (2010), ―Programming with C‖, Schaums Outline Series, Tata McGraw  Hill Publications |
| **NOTE: Latest Edition of Textbooks May be Used** | |
| **Web Resources** | |
|  | http://www.tutorialspoint.com/cprogramming/ |
|  | http://www.cprogramming.com/ |
|  | http://www.programmingsimplified.com/c-program-examples |
|  | http://www.programiz.com/c-programming |
|  | http://www.cs.cf.ac.uk/Dave/C/CE.html |
|  | http://fresh2refresh.com/c-programming/c-function/ |

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| **CO/ PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO1** | **3** | **2** | **2** | **3** | **2** | **2** |
| **CO2** | **3** | **3** | **2** | **3** | **2** | **2** |
| **CO3** | **3** | **3** | **3** | **3** | **2** | **2** |
| **CO4** | **3** | **3** | **2** | **3** | **2** | **2** |
| **CO5** | **3** | **3** | **2** | **3** | **2** | **2** |
| **Weightage of course contributed to each PSO** | **15** | **14** | **11** | **15** | **10** | **10** |

**CORE – II: Practical** - I

**C Programming Practical**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | |
| **CIA** | **External** | **Total** |
| **23UINTP14** | | 0 | 0 | 5 | I | 5 | 5 | **25** | **75** | **100** |
| **Learning Objectives** | | | | | | | | | | |
| **LO1** | The Course aims to provide exposure to problem-solving through C programming | | | | | | | | | |
| **LO2** | It aims to train the student to the basic concepts of the C -Programming language | | | | | | | | | |
| **LO3** | Apply different concepts of C language to solve the problem | | | | | | | | | |
| **Prerequisites:** | | | | | | | | | | |
| **Contents** | | | | | | | | | | |
| 1. Programs using Input/ Output functions  2. Programs on conditional structures  3. Command Line Arguments  4. Programs using Arrays  5. String Manipulations  6. Programs using Functions  7. Recursive Functions  8. Programs using Pointers  9. Files  10. Programs using Structures & Unions | | | | | | | | | | |
| **CO** | **Course Outcomes** | | | | | | | | | |
| CO1 | Demonstrate the understanding of syntax and semantics of C  programs. | | | | | | | | | |
| CO2 | Identify the problem and solve using C programming techniques. | | | | | | | | | |
| CO3 | Identify suitable programming constructs for problem solving. | | | | | | | | | |
| CO4 | Analyze various concepts of C language to solve the problem in an  efficient way. | | | | | | | | | |
| CO5 | Develop a C program for a given problem and test for its  correctness. | | | | | | | | | |

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| **CO/ PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO1** | **3** | **2** | **2** | **3** | **2** | **2** |
| **CO2** | **3** | **3** | **2** | **3** | **2** | **2** |
| **CO3** | **3** | **3** | **3** | **3** | **2** | **2** |
| **CO4** | **3** | **3** | **2** | **3** | **2** | **2** |
| **CO5** | **3** | **3** | **2** | **3** | **3** | **2** |
| **Weightage of course contributed to each PSO** | **15** | **14** | **11** | **15** | **11** | **10** |

Elective – I

(Generic/Discipline Specific)

**MATHEMATICAL FOUNDATIONS - I**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | |
| **CIA** | **External** | **Total** |
| **23UMAFE15** | 0 | 0 | 5 | I | 3 | 4 | **25** | **75** | **100** |

**UNIT-I: SYMBOLIC LOGIC**

Proposition, Logical operators, conjunction, disjunction, negation, conditional and Bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

**UNIT-II: SET THEORY**

Sets, set operations, Venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets

Functions: Types of Functions, Composition of Functions.

**UNIT-III: BINARY OPERATIONS**

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

**UNIT-IV: DIFFERENTIATION**

Differentiation, Successive differentiation, Leibnitz theorem, Applications of differentiation, Tangent and normal, angle between two curves.

**UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY**

Straight Lines - Pair Straight Lines

**Text Book**

P.R. Vittal, Mathematical Foundations – Maragham Publication, Chennai

**Reference Books**

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V. Sundaram & Others, Discrete Mathematical Foundation - A.P. Publication, Sirkali.
3. P. Duraipandian & Others, Analytical Geometry 2 Dimension - Emerald publication 1992 Reprint.

**COURSE OUTCOMES**

The students after undergoing this course will be able to

CLO1: Understand operators and solve problems using operators

CLO2: Know the concept of set theory, relations and functions

CLO3: Solve problems using permutation and combination

CLO4: Know the concept of limits, differentiation

CLO5: Solve Problems on straight lines and pair straight lines

**Outcome Mapping:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | POs | | | | | | PSOs | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 |
| CLO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 2 | 2 |
| CLO2 | 2 | 2 | 3 | 3 | - | 3 | 3 | 3 | 1 |
| CLO3 | 3 | 2 | 2 | 3 | - | - | 2 | 3 | 2 |
| CLO4 | 2 | 2 | 3 | 3 | 3 | - | 2 | 3 | 2 |
| CLO5 | 3 | 2 | 3 | 3 | 3 | - | 3 | 3 | 1 |

**Foundation Course -I Fundamentals of Computers**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | | |
| **CIA** | **External** | | **Total** |
| **23UINTF17** | | **2** | 0 | 0 | II | **2** | **2** | **25** | **75** | | **100** |
| **Learning Objectives** | | | | | | | | | | | |
| **LO1** | To analyze a problem with appropriate problem solving techniques | | | | | | | | | | |
| **LO2** | To understand the main principles of imperative, functional and logic oriented programming languages and | | | | | | | | | | |
| **LO3** | to increase the ability to learn new programming languages. | | | | | | | | | | |
| **Prerequisites:** Basic knowledge about programming concepts | | | | | | | | | | | |
| **Unit** | **Contents** | | | | | | | | | **No. of Hours** | |
| I | **Introduction:** Characteristics of Computers - Evolution of Computers **Basic Computer Organization:** I/O Unit - Storage Unit - Arithmetic Logic Unit - Control Unit - Central Processing Unit | | | | | | | | | **6** | |
| II | **Computer Software:** Types of Software - System Architecture **Computer Languages:** Machine Language - Assembly Language - High Level Language - Object Oriented Languages | | | | | | | | | **6** | |
| III | **Problem Solving Concepts:** Problem Solving in Everyday life - Types of Problems - Problem solving with computers - Difficulties with Problem Solving | | | | | | | | | **6** | |
| IV | **Problem Solving concepts for the computer:** Constant Variables - Data Types - Functions -Operators - Expressions and Equations - **Organizing the Solution:** Analyzing the problem - Algorithm - Flowchart - Pseudo code | | | | | | | | | **6** | |
| V | **Programming Structure:** Structuring a solution - Modules and their function - Local and Global variables - Parameters - Return values - Sequential Logic Structure - Problem solving with Decision - Problem Solving with Loops | | | | | | | | | **6** | |
| **TOTAL** | | | | | | | | | | **30** | |
| **CO** | **Course Outcomes** | | | | | | | | | | |
| CO1 | Outline the Computer fundamentals and various problem solving concepts in Computers | | | | | | | | | | |
| CO2 | Describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem | | | | | | | | | | |
| CO3 | Identify the types of computer languages, software, computer problems and examine how to set up expressions and equations to solve the problem. | | | | | | | | | | |
| CO4 | Choose most appropriate programming languages, constructs and features to solve the problems in diversified domains. | | | | | | | | | | |
| CO5 | Analyze the design of modules and functions in structuring the solution and various Organizing tools in problem solving. | | | | | | | | | | |
| **Textbooks** | | | | | | | | | | | |
|  | Pradeep K.Sinha and Priti Sinha, (2004) ―Computer Fundamentals‖, Sixth Edition, BPB  Publications. (Unit I : Chapter 1 & 2, Unit II : Chapter 10 & 12) | | | | | | | | | | |
|  | Maureen Sprankle and Jim Hubbard, (2009) ―Problem Solving and Programming Concept, Ninth Edition, Prentice Hall. (Unit III: Chapter 1,2 &3) Unit IV : Chapter 3, Unit V : Chapter  4,5 ,6,7 & 8) | | | | | | | | | | |
| **Reference Books** | | | | | | | | | | | |
|  | R.G. Dromey, (2007), ―How to Solve it by Computer‖, Prentice Hall International Series in  Computer Science. | | | | | | | | | | |
|  | C. S. V. Murthy, (2009), ―Fundamentals of Computers‖, Third Edition, Himalaya Publishing  House. | | | | | | | | | | |
| **NOTE: Latest Edition of Textbooks May be Used** | | | | | | | | | | | |
| **Web Resources** | | | | | | | | | | | |
|  | http://www.tutorialspoint.com/computer\_fundamentals/ | | | | | | | | | | |
|  | http://www.comptechdoc.org/basic/basictut/ | | | | | | | | | | |
|  | http://www.homeandlearn.co.uk/ | | | | | | | | | | |
|  | http://www.top-windows-tutorials.com/computer-basics/ | | | | | | | | | | |
|  | https://www.programiz.com/article/flowchart-programming (Algorithm and flow chart) | | | | | | | | | | |

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| **CO/ PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO1** | **3** | **2** | **2** | **2** | **2** | **3** |
| **CO2** | **3** | **2** | **2** | **2** | **3** | **2** |
| **CO3** | **3** | **3** | **3** | **3** | **2** | **2** |
| **CO4** | **3** | **2** | **2** | **2** | **2** | **3** |
| **CO5** | **3** | **3** | **2** | **2** | **3** | **2** |
| **Weightage of course contributed to each PSO** | **15** | **12** | **11** | **11** | **12** | **12** |

**FIRST YEAR – SEMESTER – II**

**CORE – III: JAVA PROGRAMMING**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | | |
| **CIA** | **External** | | **Total** |
| **23UINTC23** | | **5** | 0 | 0 | II | **5** | **5** | **25** | **75** | | **100** |
| **Learning Objectives** | | | | | | | | | | | |
| **LO1** | To provide knowledge on fundamentals of object-oriented programming | | | | | | | | | | |
| **LO2** | to have the ability to use the SDK environment to create, debug and run servlet programs | | | | | | | | | | |
| **Prerequisites:** Basic knowledge about programming concepts | | | | | | | | | | | |
| **Unit** | **Contents** | | | | | | | | | **No. of Hours** | |
| I | Fundamentals of Object- Oriented Programming: Introduction – Object Oriented Paradigm – Concepts of Object – Oriented Programming – Benefits of OOP – Evolution: Java History- Java Features - Differs from C and C++ - Overview of Java Language: Java Program- Structure – Tokens – Java Statements – Java Virtual Machine – Command Line Arguments | | | | | | | | | **15** | |
| II | Constants, Variables and Data Types – Operators and Expressions – Decision making and Branching – Looping – Arrays - Strings – Collection Interfaces and classes | | | | | | | | | **15** | |
| III | Classes objects and methods: Introduction – Defining a class – Method Declaration – Constructors - Method Overloading – Static Members – Nesting of methods – Inheritance – Overriding – Final variables and methods – Abstract methods and classes | | | | | | | | | **15** | |
| IV | Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Packages: Creating Packages – Accessing Packages – Using a Package – Managing Errors and Exceptions - Multithreaded Programming | | | | | | | | | **15** | |
| V | Layout Managers - JDBC – Java Servlet: - Servlet Environment Role – Servlet API – Servlet Life Cycle – Servlet Context – HTTP Support – HTML to Servlet Communication | | | | | | | | | **15** | |
| **TOTAL** | | | | | | | | | | **75** | |
| **CO** | **Course Outcomes** | | | | | | | | | | |
| CO1 | Outline the basic terminologies of OOP, programming language techniques, JDBC and Internet programming concepts | | | | | | | | | | |
| CO2 | Solve problems using basic constructs, mechanisms, techniques and technologies of Java | | | | | | | | | | |
| CO3 | Analyse and explain the behavior of simple programs involving different techniques such as Inheritance, Packages, Interfaces, Exception Handling and Thread and technologies such as JDBC and Servlets | | | | | | | | | | |
| CO4 | Assess various problem-solving strategies involved in Java to develop a high-level application. | | | | | | | | | | |
| CO5 | Design GUI based JDBC applications and able to develop Servlets using suitable OOP concepts and techniques | | | | | | | | | | |
| **Textbooks** | | | | | | | | | | | |
|  | E Balagurusamy(2010), “Programming with Java”, Tata McGraw Hill Edition India Private Ltd, 4th Edition | | | | | | | | | | |
|  | C Xavier,”Java Programming – A Practical Approach”, Tata McGraw Hill Edition Private Ltd | | | | | | | | | | |
| **Reference Books** | | | | | | | | | | | |
|  | P.Naughton and H.Schildt (1999), “Java 2 The Complete Reference”, TMH, 3rd Edition | | | | | | | | | | |
|  | Jaison Hunder & William Crawford (2002),”Java Servlet Programming”, O'Reilly | | | | | | | | | | |
|  | Jim Keogh (2002), “J2EE: The Complete Reference”, Tata McGraw Hill Edition. | | | | | | | | | | |
| **NOTE: Latest Edition of Textbooks May be Used** | | | | | | | | | | | |
| **Web Resources** | | | | | | | | | | | |
|  | <http://javabeginnerstutorial.com/core-java/> | | | | | | | | | | |
|  | <http://www.tutorialspoint.com/java/> | | | | | | | | | | |
|  | <http://beginnersbook.com/java-tutorial-for-beginners-with-examples/> | | | | | | | | | | |
|  | <http://www.homeandlearn.co.uk/java/java.html> | | | | | | | | | | |
|  | <http://www.journaldev.com/1877/servlet-tutorial-java>(Unit V : Servlet API) | | | | | | | | | | |

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| **CO/ PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO1** | **3** | **2** | **2** | **2** | **2** | **2** |
| **CO2** | **2** | **3** | **2** | **2** | **2** | **2** |
| **CO3** | **2** | **3** | **3** | **3** | **2** | **2** |
| **CO4** | **2** | **3** | **2** | **2** | **2** | **2** |
| **CO5** | **3** | **3** | **2** | **2** | **2** | **2** |
| **Weightage of course contributed to each PSO** | **12** | **14** | **11** | **11** | **10** | **10** |

**CORE – IV: Java Programming & Data Structures** **Practical**

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| **Subject Code** | | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | |
| **CIA** | **External** | **Total** |
| **23UINTP24** | | 0 | 0 | 5 | II | 5 | 5 | **25** | **75** | **100** |
| **Learning Objectives** | | | | | | | | | | |
| **LO1** | To design and develop applications using different Java programming language techniques, JDBC & Servlets | | | | | | | | | |
| **LO2** | To organize and manipulate the data with the help of fundamental data structures | | | | | | | | | |
| **Prerequisites:** | | | | | | | | | | |
| **Contents** | | | | | | | | | | |
| 1. Basic Programs 2. Arrays 3. Strings 4. ArrayList, HashSet and Vector collection classes 5. Classes and Objects 6. Interfaces 7. Inheritance 8. Packages 9. Exception Handling 10. Threads 11. Linked List 12. Stacks 13. Queue 14. Sorting 15. Binary Tree Representation 16. Working with Database using JDBC 17. Web application using Servlet | | | | | | | | | | |
| **CO** | **Course Outcomes** | | | | | | | | | |
| CO1 | Identify and explain the way of solving the simple problems | | | | | | | | | |
| CO2 | Use appropriate software development environment to write, compile and execute object-oriented Java programs | | | | | | | | | |
| CO3 | Analyze and identify necessary mechanisms of Java needed to solve real-world problem | | | | | | | | | |
| CO4 | Test for defects and validate a Java program with different inputs | | | | | | | | | |
| CO5 | Design, develop and compile Core Java , GUI , JDBC and servlet applications that utilize OOP and data structure concepts | | | | | | | | | |

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| **CO/ PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO1** | **3** | **2** | **3** | **3** | **2** | **2** |
| **CO2** | **3** | **3** | **3** | **3** | **2** | **2** |
| **CO3** | **3** | **3** | **3** | **2** | **2** | **3** |
| **CO4** | **3** | **3** | **3** | **3** | **3** | **2** |
| **CO5** | **3** | **3** | **2** | **3** | **2** | **2** |
| **Weightage of course contributed to each PSO** | **15** | **14** | **14** | **14** | **11** | **11** |

Elective – II

(Generic/Discipline Specific)

**MATHEMATICAL FOUNDATIONS - II**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code** | **L** | **T** | **P** | **S** | **Credits** | **Inst. Hours** | **Marks** | | |
| **CIA** | **External** | **Total** |
| **23UMAFE25** | 0 | 0 | 5 | I | 3 | 4 | **25** | **75** | **100** |

**UNIT-I: MATRICES**

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermitian, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by Cramer’s rule.

**UNIT-II: MATRICES**

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem,

**UNIT-III: INTEGRATION**

Integration Simple problems, integration of rational function involving algebraic expressions of the form

Integrations using simple substitutions, integrations involving trigonometric functions of the form , integration by parts.

**UNIT-IV : INTEGRATION**

Applications of Integration for (i) Area under plane curves, (ii) Volume of solid of revolution.

**UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION**

Planes, straight lines.

**Text Book.**

P.R. Vittal, Mathematical Foundations – Maragham Publication, Chennai

**Reference Books**

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V. Sundaram & Others, Discrete Mathematical Foundation - A.P. Publication, Sirkali.
3. Manicavachagompillay & Natarajan. Analytical Geometry part II - Three Dimension S. Viswanathan (printers & publication) Put Ltd., 1991.

**COURSE OUTCOMES**

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

CLO1: Understand different types of matrix operators

CLO2: Know the concept of Consistency and Inconsistency of linear equations

CLO3: Solve different forms of Integration

CLO4: Find the Area and volume using integration for real world problems.

CLO5: Know the concept of Planes, straight lines

**Outcome Mapping:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | POs | | | | | | PSOs | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 |
| CLO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 2 | 2 |
| CLO2 | 2 | 2 | 3 | 2 | - | 3 | 3 | 3 | 1 |
| CLO3 | 3 | 3 | 2 | 3 | - | - | 3 | 3 | 2 |
| CLO4 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | 2 |
| CLO5 | 3 | 2 | 3 | 2 | 3 | - | 3 | 3 | 1 |

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| **Subject Code** | | | | | | **Subject Name** | | **Category** | | **L** | | **T** | | **P** | | **S** | | **Credits** | | | **Marks** | | | | | | | | |
| **CIA** | | | | **External** | | | **Total** | |
| **23UINTN16** | | | | | | Basics of Internet | | Specific Elective | | 2 | | - | | - | |  | | 2 | | | 25 | | | | 75 | | | 100 | |
| **Learning Objectives** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO1 | | | | Knowledge of Internet medium | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO2 | | | | Internet as a mass medium | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO3 | | | | Features of Internet Technology, | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO4 | | | | Internet as source of infotainment | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO5 | | | | Study of internet audiences and about cyber crime | | | | | | | | | | | | | | | | | | | | | | | | | |
| **UNIT** | | | | **Contents** | | | | | | | | | | | | | | | | | | | | | | **No. Of. Hours** | | | |
| I | | | | The emergence of internet as a mass medium – the world of ‘world wide web’. | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| II | | | | Features of internet as a technology. | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| III | | | | Internet as a source of infotainment – classification based on content and style. | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| IV | | | | Demographic and psychographic descriptions of internet ‘audiences’ – effect of internet on the values and life-styles. | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| V | | | | Present issues such as cyber crime and future possibilities. | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| **TOTAL HOURS** | | | | | | | | | | | | | | | | | | | | | | | | | | **30** | | | |
|  | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | |
| CO | | | **Course Outcomes** | | | | | | | | | | | | | | | | |  | | | | | | | | | |
| CO1 | | | * Knows the basic concept in HTML   Concept of resources in HTML | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO2 | | | Knows Design concept.  Concept of Meta Data  Understand the concept of save the files. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO3 | | | Understand the page formatting.  Concept of list | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO4 | | | Creating Links.  Know the concept of creating link to email address | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO5 | | | Concept of adding images  Understand the table creation. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Textbooks** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | “Mastering HTML5 and CSS3 Made Easy”, TeachUComp Inc., 2014. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS” | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Web Resources** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | <https://www.w3schools.com/html/default.asp> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Subject Code** | | | | | | **Subject Name** | **Category** | | **L** | | **T** | | **P** | | **S** | | **Credits** | | **Marks** | | | | | | | | | |
| **CIA** | | | | **External** | | | | **Total** | |
| **23UINTN26** | | | | | | Fundamentals of Information Technology | Specific Elective | | 2 | | - | | - | | I | | 2 | | 25 | | | | 75 | | | | 100 | |
| **Learning Objectives** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LO1** | | Understand basic concepts and terminology of information technology. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LO2** | | Have a basic understanding of personal computers and their operation | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LO3** | | Be able to identify data storage and its usage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LO4** | | Get great knowledge of software and its functionalities | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LO5** | | Understand about operating system and their uses | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **UNIT** | | **Contents** | | | | | | | | | | | | | | | | | | | | | | **No. Of. Hours** | | | | |
| I | | **Introduction to Computers:**  Introduction, Definition, .Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer | | | | | | | | | | | | | | | | | | | | | | **6** | | | | |
| II | | **Basic Computer Organization:**  Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers. | | | | | | | | | | | | | | | | | | | | | | **6** | | | | |
| III | | **Storage Fundamentals:**  Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives | | | | | | | | | | | | | | | | | | | | | | **6** | | | | |
| IV | | **Software:**  Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w | | | | | | | | | | | | | | | | | | | | | | **6** | | | | |
| V | | **Operating System:**  Functions, Measuring System Performance, Assemblers, Compilers and Interpreters.Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux. | | | | | | | | | | | | | | | | | | | | | | **6** | | | | |
| **TOTAL HOURS** | | | | | | | | | | | | | | | | | | | | | | | | **30** | | | | |
| **Course Outcomes** | | | | | | | | | | | | | | | | | | | | | | **Programme Outcomes** | | | | | | |
| CO | | | | | On completion of this course, students will | | | | | | | | | | | | | | | | |  | | | | | | |
| CO1 | | | | | * Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it. | | | | | | | | | | | | | | | | | PO1, PO2, PO3, PO4, PO5, PO6 | | | | | | |
| CO2 | | | | | * Develop organizational structure using for the devices present currently under input or output unit. | | | | | | | | | | | | | | | | | PO1, PO2, PO3, PO4, PO5, PO6 | | | | | | |
| CO3 | | | | | Concept of storing data in computer using two header namely RAM and ROM with different types of ROM with advancement in storage basis. | | | | | | | | | | | | | | | | | PO1, PO2, PO3, PO4, PO5, PO6 | | | | | | |
| CO4 | | | | | * Work with different software, Write program in the software and applications of software. | | | | | | | | | | | | | | | | | PO1, PO2, PO3, PO4, PO5, PO6 | | | | | | |
| CO5 | | | | | Usage of Operating system in information technology which really acts as a interpreter between software and hardware. | | | | | | | | | | | | | | | | | PO1, PO2, PO3, PO4, PO5, PO6 | | | | | | |
| **Textbooks** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | Anoop Mathew, S. Kavitha Murugeshan (2009), “ Fundamental of Information Technology”, Majestic Books. | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | Alexis Leon, Mathews Leon,” Fundamental of Information Technology”, 2nd Edition. | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | S. K Bansal, “Fundamental of Information Technology”. | | | | | | | | | | | | | | | | | | | | | | | |
| **Reference Books** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | | | | | Bhardwaj Sushil Puneet Kumar, “Fundamental of Information Technology” | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | | | | | GG WILKINSON, “Fundamentals of Information Technology”, Wiley-Blackwell | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | | | | | [A Ravichandran](https://www.bookganga.com/eBooks/Books?AID=5563813659127023211) , “Fundamentals of Information Technology”, Khanna Book Publishing | | | | | | | | | | | | | | | | | | | | | | | |
| **Web Resources** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | | | | | https://testbook.com/learn/computer-fundamentals | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | | | | | https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | | | | | https://www.javatpoint.com/computer-fundamentals-tutorial | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | | | | | https://www.tutorialspoint.com/computer\_fundamentals/index.htm | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | | | | | https://www.nios.ac.in/media/documents/sec229new/Lesson1.pdf | | | | | | | | | | | | | | | | | | | | | | | |

**Mapping with Programme Outcomes:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO 1** | **PSO 2** | **PSO 3** | **PSO 4** | **PSO 5** | **PSO 6** |
| **CO 1** | 3 | 3 | 3 | 3 | 3 | 3 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 3 |
| **CO 3** | 3 | 3 | 3 | 3 | 3 | 3 |
| **CO 4** | 3 | 3 | 3 | 3 | 2 | 3 |
| **CO 5** | 3 | 3 | 2 | 3 | 3 | 2 |
| **Weightage of course contributed to each PSO** | 15 | 15 | 14 | 15 | 14 | 14 |

**S-Strong-3 M-Medium-2 L-Low-1**