Department of Information Technology
Syllabus
(Choice Based Credit System)
(W.e.f. June2021 onwards)

Structure of the Curriculum

Parts of the Curriculum	No. of Courses	Hrs/week	Credits
Part – I : Language	02	12	8
Part – II : English	02	12	8
Part – III Major			
Core (Theory)	12	50	48
Core (Practical)	07	38	19
Discipline Selective Elective(DSE)	02	09	08
Skilled Based Core (Practical)	02	08	08
Allied			
Allied (Theory)	04	16	16
Allied (Practical)	04	16	08
Group Project/ Discipline selective Elective	01	05	03
Part – IV AECC			
Environmental Studies	01	02	02
Value Based Education	01	02	02
Generic Elective (Non Major- Elective)	02	04	04
Skill enhancement Course (SEC)	03	06	06
Part – V **Extension Activities**(NSS/NCC/ YRC/ YWF/ Phy.Edu)	02	---	+2
Professional English	02	---	+2
MOOC Certificate course/ Type Writing / Tally II Year	Self Learning	---	+2
GenderStudiesCourseIII year	01	----	+1
Extra credit Course (III/IV/V/VI Semester)	Self-Learning	---	+2
		180	140+7+(2 Extra Course)

Pope's College (Autonomous), Sawyerpuram
Accredited by NAAC – II Cycle with 'A' Grade (CGPA:3.28)

Choice Based Credit System-**LOCF**
PROGRAMME Structure for Information Technology
(with effect from the Academic Year 2021 onwards)

**I Semester**

S. No	Part	Subject Status	Subject Code	Subject Title	Hrs Per Week	Credits
1	I	Language	21ULT11	Tamil	06	04
2	II	Language	21ULE11	English	06	04
3	III	Core Course – 1	21UITM11	Fundamentals of Computers and HTML	04	04
4		Allied – 1	21UITA11	Digital Principles	04	04
5		Core Course Major Practical – 1	21UITMP1	Programming in HTML	04	02
6		AlliedPractical – 1	21UITAP1	Office Automation	04	02
7	IV	AECC-I (Common-1)	21UEVS11	Environmental Studies	02	02
8	V	Extension Activities – I	21UEA21	NSS/ NCC/ YRC/YWF/Phy.Edu	-	-
9		\multicolumn{3}{c}{Professional English}	-	01
				Total	30	23

**II Semester**

1	I	Language	21ULT21	Tamil	06	04
2	II	Language	21ULE21	English	06	04
3	III	Core Course – 2	21UITM21	Programming in C	04	04
4		Core - Course Major Practical – 2	21UITMP2	Programming in C	04	02
5		Allied-2	21UITA21	Microprocessor and Its Applications	04	04
6		Allied Practical – 2	21UITAP1	Programming in Assembly Language	04	02
7	IV	AECC-II(Common-II)	21UVBE21	Value Based Education	02	02
8	V	Extension Activities – I	21UEA21	NSS/NCC/YRC/YWF/Phy.Edu	-	02
9		\multicolumn{3}{c}{Professional English}	-	01
			Total		30	25

				III Semester			
1		Core Course – 3	21UITM31	Programming in C++	04	04
2		Core Course - 4	21UITM32	Data Structures	04	04
3	III	Core Course Practical – 3	21UITMP2	Programming in C++	06	03
4		Skilled Based Core Practical–1	21UITS3A 21UITS3B	Programming in PHP/ Programming in Python	04	04
5		Allied –3	21UITA31	Discrete Mathematics	04	04
6		Allied 3 Practical – 3	21UITAP3	Programming in JavaScript/ Programming in VBScript	04	02
7	IV	Generic Elective-1 (Non Major Elective – 1)	21UITN3A 21UITN3B	Introduction of Information Technology/ Basic Programming Design	02	02
8		Skill enhancement course-1 (Common-III)	21USEC31	Field Visit / Yoga/Soft skill	02	02
9	V	Extension Activities – 2	21UEA41	NSS/ NCC/YRC/YW/Phy.Edu	-	-
10		MOOC Certificate course / Type Writing/ Tally			-	-
				Total	30	25

				IV Semester			
1		Core Course – 5	21UITM41	Programming in Java	04	04
2		Core Course – 6	21UITM42	Operating Systems	04	04
3	III	Core Course Practical – 4	21UITMP4	Programming in Java	06	03
4		Skill Based Core Practical–2	21UITS4A 21UITS4B	Desktop Publishing/ Animation Applications	04	04
5		Allied -4	21UITA41	Computer Graphics	04	04
6		Allied -Practical – 4	21UITAP4	Computer Graphics Using C	04	02
7	IV	Generic Elective-2 (Non Major-Elective-2)	21UITN4A 21UITN4B	Fundamentals of Internet/ Web Design Using HTML	02	02
8		Skill enhancement course- 2 (Common-IV)	21USEC4A 21USEC4B	Computer for Digital Era	02	02
9	V	Extension Activities - 2	21UEA41	NSS/ NCC, / YRC/YWF/Phy.Edu	-	01
10		MOOC Certificate Course/ Type Writing/ Tally			-	02
				Total	30	28

				V Semester			
1	III	Core Course – 7	21UITM51	Relational Database Management System	04	04
2		Core Course – 8	21UITM52	Visual Programming	04	04
3		Core Course – 9	21UITM53	Computer Networks	04	04
4		Discipline Specific Elective – 1	21UITM5A 21UITM5B	Data Mining / Mobile Computing	04	04
5		Core Course Practical – 5	21UITMP5	RDBMS Lab	06	03
6		Core Course Practical – 6	21UITMP6	Visual Programming Lab	06	03
7	IV	Skill enhancement course-3(Common –V)	21UCSB5A 21UCSB5B 21UCSB5C	Personality Development/ Effective Communication/ Youth leadership	02	02
	V	Gender Studies Course			-	-
				Total	30	24

				VI Semester			
1	III	CoreCourse – 10	21UITM61	Programming in .Net	04	04
2		Core Course– 11	21UITM62	Internet Security	05	04
3		Core Course – 12	21UITM63	Software Engineering	05	04
		Discipline specific Elective –2	21UITM6A 21UITM6B	Cloud Computing / Cryptography and Network Security	05	04
4		Core Course Practical – 7	21UITMP7	Programming in .Net	06	03
5		Core Project	21UITM6P	Major Project	05	03
6	V	Gender Studies Course			--	01
		Total			30	23
				Total	180	148

Extra Credit Courses

No	Semester	Course Code	Title of the Course	Credits
1	III		Fundamentals of Computers	
2	IV		Tally	
3	V		Web Designing	
4	VI		Mobile Application Development	

CORE	Sub. Code	FUNDAMENTALS OF COMPUTERS	Hrs./Week	Credits
I	21UITM11	AND HTML	4	4

Course Objectives:

The students would be able to:

➢ Understand the basic uses and applications of computer.

➢ Know different types of memory and various input and output devices.

➢ Learn how to link pages so that they create a Web site.

➢ Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

➢ Learn how to use graphics in Web design.

UNIT – I   *(12 Hrs)*

Introduction: Generations of Computers. Software and Hardware - Different Parts of a Computer and their uses – Types of Computers – Anatomy of Computer System – Computer Software – Computer Viruses and Security-Operating System – Functions of operating system.

UNIT – II   *(13 Hrs)*

Input Output Media: Introduction - Types of Input Devices: Keyboard – Mouse – Trackball – Light Pen – Touch Screen – Digital Camera – Scanners – Optical Scanners. Types of Output Devices: Printers – Types of Printers – Plotter – Computer Monitor – Types of Computer Monitor –Computer Networks – Types of Networks – Uses of computer networks.

UNIT – III   *(12 Hrs)*

Introduction to HTML: First HTML Document – HTML Formatting Tags – Inserting Images – Linking Documents with Hyperlink.

UNIT – IV   *(11 Hrs)*

List: Ordered List – Unordered List – Definition List. **Tables:** Introduction to Table –Table Tag and its Attributes.

UNIT – V   *(12 Hrs)*

Frames: Introduction to Frames – Frame Tag and its Attributes. **Forms:** Introduction to Forms – Form Tag – Elements of Form.

Text Books:

1. "Introduction to Information Technology", ITL Education Solutions Ltd., Pearson Education, 2009

2. "Web Technology", L.Mathu Krithigha Venkatesh, Margham Publications, 2012.

Reference Books:

1. Peter Norton, "Introduction to Computer", McGraw Companies, 2000.

2. David Mercer, "HTML Introduction to web page design and development", Tata McGraw Hill Publication Company Limited, 2001

Course Outcomes:

After completing this course, students will be able to:

➢ Bridge the fundamental concepts of computer

➢ Classify the input and output devices

➢ Understand the basic html tags

➢ Learn list and table tags

➢ Develop a webpage by the use of html

ALLIED	Sub. Code	DIGITAL PRINCIPLES	Hrs./Week	Credits
I	21UITA11		4	4

Course Objectives:

The students would be able to:

- ➢ Understand the basic knowledge of number systems.
- ➢ Know different types of logic gates.
- ➢ Learn the fundamental principles of arithmetic circuits.
- ➢ Learn the sequential logic circuits.
- ➢ Learn the memory elements.

UNIT – I   *(13 Hrs)*

Number Systems: Number systems - Decimal, Binary, Octal, Hexadecimal - conversion from one to another. Characters and codes: ASCII code, Excess- 3 code, gray code - binary addition, subtraction, multiplication and division - unsigned binary numbers - signed magnitude numbers - complements in number systems

UNIT – II   *(12 Hrs)*

Logic Gates: AND, OR, NOT, NOR & NAND gates, EX-OR gates. **Boolean Algebra and Boolean Laws and Theorems:** De Morgan's theorems – Duality theorem - simplification of sum of product and product of sum expressions - Karnaugh map and simplifications.

UNIT – III   *(11 Hrs)*

Simple Arithmetic Circuits: Half and Full adders - Binary adder/subtractor - BCD adder. **Data Processing Circuits:** Multiplexers - Demultiplexers –Encoders and Decoders.

UNIT – IV   *(12 Hrs)*

Sequential Logic Design: Flip-flops - RS, JK, D & T Flip flops - Master / Slave Flip flop - Shift Registers - Counters - Asynchronous and Synchronous Counters.

UNIT – V   *(12 Hrs)*

Memory Elements: RAM - Static RAM - Dynamic RAM - ROM – Magnetic Disk memories - Magnetic tape - Cache Memory.

Text Books:

1. Donald P. Leach and Albert Paul Malvino, "Digital Principles and Application", Fifth Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2003. (Units: I-IV)
2. David Harris, "Logic Design and Computer Architecture", McGraw Hill, New Delhi, 2012. (Unit: V)

Reference Books:

1. Virendra Kumar, "Digital Technology Principles and Practice", New Age International, New Delhi, 2006.
2. Jaydeep Chakravorty, "Digital Electronics and Logic Design", Universities Press, 2012, ISBN : 8173717613.

Course Outcomes:

After completing this course, students will be able to:

➢ Understand the Digital number system and their conversions
➢ Identify the operations of logic Gates and simplify the Boolean expressions using K-Map
➢ Comprehend the fundamental principles of simple Arithmetic Circuits
➢ Realize the design of sequential logic circuits
➢ Gain the knowledge about the memory elements

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN HTML	Hrs./Week	Credits
I	21UITMP1		4	2

Course Objectives:

The students would be able to

> ➢ Design a simple web page.
>
> ➢ Insert a graphic within a web page.
>
> ➢ Insert heading levels within a web page.
>
> ➢ Insert ordered and unordered lists within a web page.
>
> ➢ Create a link within a web page.
>
> ➢ Create a table within a web page.

MAJOR – PRACTICAL LIST

1. Designing a Simple Webpage.
2. Designing a Webpage with Image.
3. Designing a Web page using bgcolor and Heading Tags.
4. Designing a Web page Using Ordered List.
5. Designing a Web page Using Unordered List.
6. Designing a Web page Using Formatting tags.
7. To Design a Webpage with Links.
8. To Design a Webpage Using Tables.
9. To Design a Webpage Using Frames.
10. To Design a Webpage with Forms.

Course Outcomes:

After completing this course, students will be able to:

> ➢ Identify how to create a simple web page
>
> ➢ Identify how to format text and background
>
> ➢ Demonstrate creating list
>
> ➢ Demonstrate creating tables
>
> ➢ Identify adding web links and forms

ALLIED PRACTICAL	Sub. Code	OFFICE AUTOMATION	Hrs./Week	Credits
I	21UITAP1		4	2

Course Objectives:

The students would be able to

- ➢ Create, edit, save and print documents.
- ➢ Format text and to use styles.
- ➢ Add a header, footer and image.
- ➢ Use the spread sheet applications.
- ➢ Create presentation and apply animation and transitions.
- ➢ Create database and its concepts.

ALLIED – PRACTICAL LIST

MS – Word

1. Prepare a document and apply Cut, Copy and Paste operations.
2. Find a word and Replace with another in a document.
3. Letter Writing.
4. Insert Header and Footer.
5. Insert a picture in your document.
6. Preparing News Paper format (Apply Alignment, Font Property, Line spacing, Picture Format).
7. Prepare a Bio-Data.
8. Time Table Preparation.
9. Mail Merge.

MS – Excel

1. Mark Sheet Preparation.
2. Apply ascending and descending.
3. Prepare a chart.

MS – PowerPoint

1. Create a power point presentation with 3 slides.
2. Create a design template with 3 slides.
3. Create a presentation with animation.

MS – Access

1. Create an employee database.
2. Create a salary list presentation.
3. Create a report.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Work with a basic features of Word
- ➢ Format paragraphs, insert and work with pictures
- ➢ Use the mail merge wizard to perform mail merge
- ➢ Work with the spread sheets
- ➢ Create high quality presentation
- ➢ Create database and modify tables

CORE	Sub. Code	**PROGRAMMING IN C**	Hrs./Week	Credits
II	**21UITM21**		**4**	**4**

Course Objectives:

The students would be able to:

> ➢ Understand the fundamentals of programming structures.
> ➢ Learn the different types of control structures.
> ➢ Learn arrays and functions.
> ➢ Understand the concepts of pointers.
> ➢ Understand structures and unions.

UNIT – I   *(11 Hrs)*

Algorithms - Flow charts - Developing algorithms and flowcharts for solving simple problems using sequential, selection and iterative programming Structures.

UNIT – II   *(12 Hrs)*

Structure of a C program - Data Types – Constants and Variables – Operators and Expressions - Control structures - Looping structures.

UNIT – III   *(13 Hrs)*

Arrays - Functions - Built-in-functions - User defined functions - Scope of Variables - Passing Arrays to function - Strings.

UNIT – IV   *(12 Hrs)*

Pointers: Introduction - Pointer Array - Pointer Arithmetic - Pointer of Pointer- Functions and Pointers - Call by value and call by reference – Structures and Pointers - Dynamic Allocation - Function pointer.

UNIT – V   *(12 Hrs)*

Type modifiers and storage class specifiers - Structures – Basics of structures– Declaration of structure – Referencing Structures elements - Array of Structures – Nesting of structures - Passing Structures to function – Union – Files – Reading a file – Opening a file – Closing a file.

Text Books:

1. S. Jaiswal, "Information Technology Today", Galgotia Publications, New Delhi, 2003, (Unit I)
2. E.Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, New Delhi, Seventh Edition, 2016 (Unit II, III, IV, V).

Reference Books:

1. Yashavant Kanetkar, "Let us C", BPB Publications, Tenth Edition, New Delhi: 2010.
2. E. Karthikeyan, "A Textbook on C Fundamentals, Data Structures and Problem Solving", Prentice-Hall of India Private Limited, New Delhi, 2008.

Course Outcomes:

After completing this course, students will be able to:

➢ Knowledge on problem solving using the computer
➢ Knowledge on constructs of C Language
➢ Skills in writing C programs
➢ Ability to use the functions efficiently
➢ Skill on memory management and use of printers
➢ Ability to design and use structures

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN C	Hrs./Week	Credits
II	21UITMP2		4	2

Course Objectives:

The students would be able to:

> ➤ Apply the syntax rules for numerical constants and variables.
> ➤ Usage of operators.
> ➤ Usage of decision making statements.
> ➤ Usage of conditional statements.
> ➤ Writing programs using functions and recursion.
> ➤ Improvement one dimensional and two dimensional arrays.

MAJOR – PRACTICAL LIST

1. Program using if statement.
2. Program using if…else statement.
3. Program using nested if-else statement.
4. Program using switch case Statement.
5. Program using while loop
6. Program using do-loop
7. Program using for-loop
8. Program using Function
9. Program using Recursive Function
10. Program implementing One-dimensional Array
11. Program implementing Two-dimensional Array
12. Program to process Strings
13. Program implementing structure
14. Program to process files

Course Outcomes:

After completing this course, students will be able to:

> ➤ Understand the syntax for numerical constants and variables.
> ➤ Understand operators
> ➤ Understand decision making statements.
> ➤ Understand control structures.
> ➤ Understand arrays, functions and pointers.
> ➤ Demonstrate practical applications.

ALLIED	Sub. Code	MICROPROCESSOR AND ITS	Hrs./Week	Credits
II	21UITA21	APPLICATIONS	4	4

Course Objectives:

The students would be able to:

> ➢ Study the Intel 8085 architecture and bus concepts
> ➢ Learn and design the concepts of machine cycles and instruction set
> ➢ Understand the interface concepts
> ➢ Learn the fundamental knowledge of interrupts of Intel 8085
> ➢ Understand the knowledge on assembly programming

UNIT – I   *(13Hrs)*

Introduction to Microprocessor: Evolution of Microprocessor – Basic Functional Blocks of Microprocessor – Architecture of 8085 – Pin diagram of 8085 and its description – Address bus, Data bus and Control bus – Concept of Multiplexing in Microprocessor – 8085 Programmers Model.

UNIT – II   *(12 Hrs)*

Machine Cycles of 8085: Opcode Fetch – Memory Read – Memory Write – IO Read – IO Write. **Instruction Set of 8085:** Instruction Set – Data Transfer Instructions – Arithmetic Instructions – Logical Instructions – Branching Instructions – Machine Control Instructions.

UNIT – III   *(12 Hrs)*

Addressing Modes – **Memory and IO Interfacing:** Interfacing Static RAM and EPROM – Memory Organization in 8085-based system –Programmable Peripheral Interface INTEL 8255.

UNIT – IV   *(11 Hrs)*

Interrupts: Classification of Interrupts – Interrupts of 8085 – Enabling, Disabling and Masking of 8085 interrupts – Polling of Interrupts – RIM, SIM instructions.

UNIT – V   *(12 Hrs)*

Assembly Language Programming: Levels of Programming – ALP development tools. **System Design and Applications:** Designing a microprocessor-based system – Temperature control system – Traffic light control system.

Text Book:

1. "8085 Microprocessor and Its Applications", A.Nagoor Kani, Third Edition, McGraw Hill Education, 2013.

Reference Book:

1. Introduction to Microprocessors and Microcontrollers, John Crisp, 2003, Elsevier.

Course Outcomes:

After completing this course, students will be able to:

➢ Collected knowledge on Intel 8085 architecture and bus concepts
➢ Understood and the concepts of machine cycles and instruction set
➢ Familiarity on interfaces
➢ Get the fundamental knowledge of interrupts of Intel 8085
➢ Acquired knowledge on assembly programming

ALLIED PRACTICAL	Sub. Code	PROGRAMMING IN ASSEMBLY LANGUAGE	Hrs./Week	Credits
II	21UITAP2		4	2

Course Objectives:

The students would be able to:

- ➢ Learn to write assembly language program
- ➢ Learn to debug the assembly language program
- ➢ Understand the various addressing modes
- ➢ Understand the control flow and instructions
- ➢ Learn to modify the contents of memory

ALLIED PAPER – PRACTCAL LIST

1. Addition of two 8-bit numbers
2. Subtraction of two 8-bit numbers
3. Multiply with repeated addition
4. Division with repeated subtraction
5. Combining two nibbles
6. Odd and even numbers
7. Smallest among two numbers
8. Block transfer
9. Complements of numbers
10. Ascending order

Course Outcomes:

After completing this course, students will be able to:

- ➢ Ability to write assembly language program
- ➢ Ability to debug the assembly language program
- ➢ Knowledge of various addressing modes
- ➢ Knowledge of control flow and instructions
- ➢ Ability to modify the contents of memory

CORE	Sub. Code	**PROGRAMMING IN C++**	Hrs./Week	Credits
III	**20UITM31**		4	4

Course Objectives:

The students would be able to:

  ➢ Understand the syntax and semantics of the C++ programming language.
  ➢ Learn how to design C++ classes for code reuse.
  ➢ Learn how to implement copy constructors and class member functions.
  ➢ Understand the concept of data abstraction and encapsulation.
  ➢ Understand the overload functions and operators in C++.

UNIT – I   Classes and objects   *(11 Hrs)*

Introduction- C structures revisited - specifying a class- defining member functions - a C++ program with class - Making an outside function inline - Nesting of member functions - Private member functions - Array within a class - Static data members - Static member functions - Array of objects - Friend functions.

UNIT – II   Constructors and Destructors   *(13 Hrs)*

Introduction – constructors - parameterized constructors - multiple constructor in a class - constructor with default arguments - dynamic initialization of objects - copy constructor – dynamic constructors - constructing two - dimensional arrays - constant objects - Destructors.

UNIT – III   Function Loading and Operator Overloading   *(12 Hrs)*

Function Overloading – Introduction - defining operator overloading - overloading unary operators - overloading binary operators - rules for overloading operators – Type Conversions.

UNIT – IV   Inheritance: Extending Classes   *(12 Hrs)*

Introduction - defining derived classes- single inheritance - multilevel inheritance- multiple inheritance - hierarchical inheritance - hybrid inheritance – virtual base classes - abstract classes - constructors in derived classes member classes: Nesting of classes.

UNIT – V   Working with Files   *(12 Hrs)*

Introduction - classes for file stream operations - opening and closing a file - detecting End-of-file - more about open(): file modes - file pointers and their manipulations-

sequential input and output operations- updating a file: Random Access - error-handling during file operations - Templates.

Text Book:

1. Object Oriented Programming with C++ By E.Balagurusamy, The McGraw-Hill, 4th Edition. Chapters: 5 (except 5.17, 5.18, 5.19), 6, 7, 8, 15.

Reference Book:

1. Object Oriented Programming in Turbo C++ By Robert Lafore, Galgotia Publications, 2012.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Understand the syntax and semantics of the C++ programming language.
- ➢ Design C++ classes for code reuse.
- ➢ Implement copy constructors and class member functions.
- ➢ Understand the concept of data abstraction and encapsulation.
- ➢ Understand the overload functions and operators in C++.

CORE	Sub. Code	DATA STRUCTURES	Hrs./Week	Credits
IV	**21UITM32**		**4**	**4**

Course Objectives:

The students would be able to:

- ➢ Understand the concepts of basic data structures
- ➢ Understand the concepts of stack, Queues and Linked list.
- ➢ Learn the network structures through trees.
- ➢ Outline the basic concept of Trees.
- ➢ Understand the basic algorithms for sorting.

UNIT – I *(10 Hrs)*

Basic Concepts: Algorithm specification – Data Abstraction – Performance Analysis.
Arrays and Structures: Arrays: Abstract data type – Sparse Matrices – Representation of Multidimensional Arrays.

UNIT – II *(13 Hrs)*

Stacks and Queues: Stacks –Operations on Stack- Queues-Operations on Queue-– Evaluation of Expressions. **Linked Lists**: Singly Linked Lists –Doubly Linked List-Circular Linked List.

UNIT – III *(13 Hrs)*

Trees:- Introduction – Binary Trees – Binary Tree Traversals: Inorder Traversal – Preorder Traversal – Postorder Traversal. Binary Search Trees.

UNIT – IV *(12 Hrs)*

Graphs: - The Graph Abstract Data Type-Elementary Graph Operations – Minimum Cost Spanning Trees: Kruskal's Algorithm – Prim's Algorithm.

UNIT – V *(12 Hrs)*

Sorting: Insertion Sort –Bucket Sort-Selection Sort – Merge Sort- shell sort-**Hashing**: Static Hashing: Hash Tables.

Text Book:

1. Fundamentals of Data Structures in C by Ellis Horowitz, Sartaj Sahni, Susan Anderson- Freed – Second Edition – Universities Press (India) Private Limited, 2008.

Reference Books:

1. Data Structures Using C, Second Edition by Reema Thareja – Oxford University Press, 2014.
2. Data Structures by Dr N Jeya Prakash – Anuradha Publications, 2009.

Course Outcomes:

After completing this course, student will be able to:

- ➢ Describe how arrays are represented in memory.
- ➢ Describe common applications for arrays
- ➢ Demonstrate different methods for traversing trees
- ➢ Implementation of the data structure Graph
- ➢ Demonstrate different methods for Sorting

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN C++	Hrs./Week	Credits
III	21UITMP3		6	3

Course Objectives:

The students would be able to:

 ➢ Understand the fundamental programming concepts.

 ➢ Learn classes and objects.

 ➢ Understand the concepts of virtual functions.

 ➢ Classify the file concepts.

MAJOR – PRACTICAL LIST

1. Program to declare all members of a class as public. Access the element using objects.

2. Program to show difference between static and non-static member variables.

3. Program using arrays within a class.

4. Program using arrays of objects.

5. Program to invoke constructor and destructor

6. Program using Inline Function.

7. Program using Function overloading.

8. Program using Operator Overloading Using Unary – Operator

9. Program using Friend Function.

10. Program using Single Inheritance.

11. Program using Multiple Inheritance.

12. Program using Multilevel Inheritance.

13. Program using Virtual Function.

14. Program using Text file.

15. Program using Templates.

Course Outcomes:

After completing this course, students will be able to:

 ➢ Understand the difference between top-down and bottom-up approach.

 ➢ Describe the object-oriented programming approach.

 ➢ Apply the concepts of object-oriented programming.

 ➢ Illustrate the process of data file manipulation.

 ➢ Apply virtual and pure virtual function.

SKILLED BASED CORE PRACTICAL	Sub. Code	PROGRAMMING IN PHP	Hrs./Week	Credits
I	21UITS3B		4	4

Course Objectives:

The students would be able to:

➢ List the major elements of the PHP & MySQL.

➢ Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.

➢ Analyze the basic structure of a PHP.

➢ Learn how databases work and how to design.

➢ Learn different ways of connecting to MySQL through PHP.

Skill Based Practical List

1. Write a PHP program to display an information in neat format
2. Write a PHP program to demo the usage of selective commands
3. Write a PHP program to demo the usage of iterative statements
4. Write a PHP program to use string functions
5. Write a PHP program to use numeric functions
6. Write a PHP program to use arrays
7. Write a PHP program to use functions
8. Write a PHP program to use forms
9. Write a PHP program to use form redirection
10. Write a PHP program to perform error handling
11. Write a PHP program to use cookies
12. Write a PHP program to use sessions

Course Outcomes:

After completing this course, students will be able to:

➢ Write PHP scripts to handle HTML forms.

➢ Write regular expressions

➢ Create PHP programs that use various PHP library functions,

➢ Analyze and solve various database tasks.

➢ Analyze and solve common error handling technique.

SKILLED BASED CORE PRACTICAL	Sub. Code	PROGRAMMING IN PYTHON	Hrs./Week	Credits
I	21UITS3B		4	4

Course Objectives:

The students would be able to:

 ➢ Interpret the use of procedural statements like assignments, conditional statements, loops and function calls.
 ➢ Infer the supported data structures like Lists, Dictionaries and Tuples in Python.
 ➢ Illustrate the application of matrices and regular expressions in building the Python programs.
 ➢ Discover the use of external modules in creating excel files and navigating the file systems.
 ➢ Describe the need for Object-oriented programming concepts in Python.

Skill Based Practical List

 1. Write a Python program to test whether a passed letter is a vowel or not.
 2. Write a Python program to compute the greatest common divisor (GCD) of two positive integers.
 3. Write a Python program to display your details like name, age, and address in three different lines.
 4. Write a Python program to display the first n terms of Fibonacci series.
 5. Write a Python program to calculate the sum of the digits in an integer.
 6. Write a Python Program to calculate the sum of two compatible matrices.
 7. Write a Python Program to create a Tuples.
 8. Write a Python Program to read the user option for performing the Dictionary Operations.
 9. Write a Python Program to perform various operations on Lists.
 10. Write a Python Program to count the number of lines and words in the input file.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Create executable code.
- ➢ Implement Conditionals and Loops for Python Programs.
- ➢ Use functions and represent Compound data using Lists, Tuples and Dictionaries
- ➢ Read and write data from & to files in Python.

ALLIED	Sub. Code	**DISCRETE MATHEMATICS**	Hrs./Week	Credits
III	**21UITA31**		**4**	**4**

Course Objectives:

The students would be able to:

- ➢ Learn about the concepts of set theory
- ➢ Learn about the concepts of Relations
- ➢ Understand the concept of Functions
- ➢ Understand the concept of Matrix
- ➢ Understand the concept of graph theory

UNIT – I   *(10 Hrs)*

Set Theory: Introduction – Sets – Ordered Pairs – Venn Diagrams – Operations of Sets – Algebra of Sets –Multi-set – Fuzzy Set.

UNIT – II   *(13 Hrs)*

Relations: Introduction to Relations – Binary Relation – Classification of Relations – Composition of Relations – Inverse of Relation – Representation of Relations on a Set – Closure operation on Relations – Matrix representation of Relation.

UNIT – III   *(12 Hrs)*

Functions: Introduction to Functions – Addition and Multiplication of Functions – Classification of Functions – Composition of Function – Inverse Function.

UNIT – IV   *(13 Hrs)*

Matrix Algebra: Introduction – Definition of a Matrix – Types of Matrices – Operations on Matrices – Related Matrices: Transpose of a Matrix – Symmetric and Skew-symmetric Matrices – Complex Matrix – Conjugate of a Matrix – Determinant of a Matrix.

UNIT – V   *(12 Hrs)*

Graph: Introduction – Graph and Basic Terminologies – Types of Graphs – Operations on Graphs – Representation of Graph.

Text Book:

1. Discrete Mathematics, Swapan Kumar Chakraborty and Bikash Kanti Sarkar, Oxford University Press, 2016.

Reference Books:

1. Discrete Mathematics, Third Edition, Seymour Lipschutz and Marc Lars Lipson, Tata McGraw Hill Education Private Limited, 2017.
2. Discrete Mathematical Structures with Applications to Computer Science by J.P.Tremblay, R. Manohar TMH Edition, 2017.

Course Outcomes:

After completing this course, students will be able to:

➢ Describe the concepts of set theory
➢ Describe the concepts of Relations
➢ Implement the concepts of Functions
➢ Comprehend the concept of Matrix
➢ Understand the concept of graph theory

ALLIED PRACTICAL	Sub. Code	PROGRAMMING IN JAVASCRIPT	Hrs./Week	Credits
III	21UITAP3		4	2

Course Objectives:

The students would be able to:

- ➢ Create simple java script documents.
- ➢ Add content to an HTML page using HTML elements.
- ➢ Use hyperlinks to connect various HTML pages together.
- ➢ Implement program logic using JavaScript.
- ➢ Capture user input using forms.

ALLIED PRACTICAL LIST:

JAVA SCRIPT

1. Create a Simple JavaScript application.

2. Develop a JavaScript application using conditional statements.

3. Develop a JavaScript array manipulation application.

4. Develop a JavaScript application using switch statement.

5. Develop a JavaScript application using recursive function.

6. Develop a JavaScript user login application which authenticates a user.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Create Web Pages using Hypertext Markup Language.
- ➢ Create Sophisticated Document Structures using HTML.
- ➢ Design Web Pages Elements using Cascading Style Sheets.
- ➢ Implement Program Flow using JavaScript (JS).
- ➢ Add External Libraries to Enhance HTML Applications.

ALLIED PRACTICAL	Sub. Code	PROGRAMMING IN VBSCRIPT	Hrs./Week	Credits
III	21UITAP3		4	2

Course Objectives:

The students would be able to:

- ➢ Create simple vbscript program.
- ➢ Use different operators in vbscript.
- ➢ Use all looping statements.
- ➢ Understand array manipulation.
- ➢ Understand string functions.

ALLIED PRACTICAL LIST:

VB SCRIPT

1. Create a Simple VbScript program.

2. Write a VbScript program using operators.

3. Write a VbScript program using looping statements.

4. Write a VbScript program using conditional statements.

5. Write a VbScript program using array manipulation.

6. Write a VbScript program using string functions.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Develop simple vbscript program.
- ➢ Familiarize different operators in vbscript.
- ➢ Familiarize all looping statements.
- ➢ Implement array manipulation.
- ➢ Implement string functions.

NON-MAJOR ELECTIVE	Sub. Code	INTRODUCTION TO INFORMATION TECHNOLOGY	Hrs./Week	Credits
I	21UITN3A		2	2

Course Objectives:

The students would be able to:

➢ Learn the basic concepts of Information Technology.

➢ Know the types of Memory.

➢ Understand the input and output devices.

➢ Learn basic the concepts of multimedia.

➢ Learn the basic concepts of Internet.

UNIT – I   *(8 Hrs)*

Information Technology Basics: Introduction, Information Technology, Present Scenario, Role of Information Technology, Information Technology and Internet, Careers in IT industry. **Computer Memory and Storage**: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU Interaction.

UNIT – II   *(6 Hrs)*

Input Output Media: Introduction, Types of input devices, Types of output devices.

UNIT – III   *(4 Hrs)*

Multimedia Essentials: Introduction, Definition, Building Blocks of multimedia, multimedia system, multimedia applications, Virtual reality.

UNIT – IV   *(6 Hrs)*

The Internet: Introduction Evolution of Internet – Basic Internet Terms – Getting Connect to Internet – Internet Applications – Data over Internet. **Internet Tools:** Introduction – Web Browser – Browsing Internet using Internet Explorer – E – Mail – Search Engines – Instant Messaging.

UNIT – V   *(6 Hrs)*

Emerging Trends in IT: Introduction, E-Commerce – Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

Text Books:

1. Introduction to Information Technology ITL Education Solutions Limited, Pearson Education, 2009.
2. Fundamentals of Information Technology By Alexis Leon & Mathews Leon, Vikas Publication – New Delhi, 2009.

Course Outcomes:

After completing this course, studenst will be able to:
- ➢ Understand the basic concepts of Information Technology.
- ➢ Classify the types of Memory.
- ➢ Classify the input and output devices.
- ➢ Analyze the basic concepts of multimedia.
- ➢ Familiarize the concepts of Internet.

NON- MAJOR ELECTIVE	Sub. Code	BASIC PROGRAMMING DESIGN	Hrs./Week	Credits
I	21UITN3B		2	2

Course Objectives:

The students will be able to:

- ➤ Learn the basic concepts of programming design.
- ➤ Learn the specifications of algorithms, procedures, and interaction behavior.
- ➤ Know software systems and to use a range of programming languages and tools to develop computer programs to solve problems effectively.
- ➤ Understand to select appropriate techniques to tackle and solve problems.

UNIT – I   *(5 Hrs)*

Introduction – Algorithms, Flowcharts, Types of Programming Languages, Selection of Programming Languages, Program Writing Debugging.

UNIT – II   *(6 Hrs)*

Flow Charts – Elementary Concepts – Introduction, Kinds of flow charts, symbols used in flow charts, Advantages of flow charts, examples, constants and variables.

UNIT – III   *(6 Hrs)*

Flow Charting Simple Computation – Introduction, illustrating examples, conclusions.

UNIT – IV   *(6 Hrs)*

Subscripted Variables – Introduction, basic concepts of subscripted variables, one dimensional array, illustrating examples, conclusions.

UNIT – V   *(7 Hrs)*

Multidimensional Arrays – Introductions, definitions, matrix operations, illustrating examples, beyond two dimensions, conclusions – Introduction to File Structure.

Introduction, Concept of data files, Types of Data Files, File Organization methods, File Processing activities, Conclusions.

Text Book:

1. Basic Programming Design, D.S. Arul Selvan & A.A. RegiesonSylum Shalom Publications, Green St, Nagercoil.

Reference:

1. Insight into Flowcharting by Raj K. Jain, S. Chand & Company Ltd, 2000.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Understand the basic concepts of programming design.
- ➢ Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
- ➢ Familiarize software systems and to use a range of programming languages and tools to develop computer programs to solve problems effectively.
- ➢ Ability to select appropriate techniques to tackle and solve problems.

CORE	Sub. Code	**PROGRAMMING IN JAVA**	Hrs./Week	Credits
V	**21UITM41**		**4**	**4**

Course Objectives:

The students would be able to:

➢ Gain knowledge the Java programming language.

➢ Learn the object-oriented features of the Java language.

➢ Learn advances java programming concepts like interface, threads, applets, etc.

➢ Understand the concepts of exception handling.

➢ Implement I/O functionality to read from and write to text files.

UNIT – I *(10 Hrs)*

Introduction to Java – Features of Java – Java Development Environment –Simple programs – Java History and Feature – Java Development Kit (JDK) – Java Tokens – Java Statements – variables – Java Character set – Operators – Strings and String Buffers.

UNIT – II *(12 Hrs)*

Classes, Interfaces and Packages: Conditional and Looping Statements - Classes – Objects –- Static members- Abstract and Final classes - Method Overloading – Method Overriding. - Wrapper Classes

UNIT – III *(12 Hrs)*

Constructor **-** Inheritance Extending classes– Interfaces and Inheritance - Final Variables and Methods—arrays – Packages and Interfaces.- Threads – Creating Threads – Life Cycle of Threads – Extending Thread Class – Accessing thread members.

UNIT – IV *(13 Hrs)*

Exception Handling: Error Handling and Exception Handling – Exception Types and Hierarchy – Try Catch blocks – Use of Throw, Throws and Finally – Programmer Defined Exceptions.

UNIT – V *(13 Hrs)*

Applets and Graphics: Fundamentals of Applets – Graphics. **AWT and Event Handling:** AWT components and Event Handlers – AWT Controlsand Event Handling Types and Examples –Introduction. **Input and Output:** Files – Streams.

Text Book:

1. Programming with Java a Primer, 4/E, E.Balaguruswamy, McGraw Hill, 2010.

Reference Book:

1. Programming with Java - C.Muthu, 2008.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Understand the principles and practice of object oriented analysis and design.
- ➢ Ability to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- ➢ Demonstrate the principles of object oriented programming;
- ➢ Understand the concept of package, interface, multithreading and File handling in java.
- ➢ Ability to make use of members of classes found in the Java API.

CORE	Sub. Code	OPERATING SYSTEMS	Hrs./Week	Credits
VI	21UITM42		4	4

Course Objectives:

The students would be able to:

➢ Gain knowledge of basic operating system concepts.

➢ Have an in-depth understanding of process concepts, deadlock and memory management.

➢ Provide an exposure to scheduling algorithms, devices and information management.

➢ Familiarize on the general structure of an operating system and case study is also provided.

UNIT – I *(10 Hrs)*

Introduction and Definition of OS – Process Concept: Definition of Process – Process States – Process State Transition – Interrupt Processing – Interrupt Classes – Context Switching. Deadlock: Introduction – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Deadlock Recovery – Indefinite Postponement.

UNIT – II *(12 Hrs)*

Storage Management Real Storage: Real Storage Management Strategies – Contiguous Vs Non-Contiguous Storage Allocation – Single User Contiguous Storage Allocation – Fixed Partition Multiprogramming – Variable Partition Multiprogramming, Multiprogramming with Storage Swapping.

UNIT – III *(13 Hrs)*

Processor Management Job and Processor Scheduling: Preemptive Vs Non-Preemptive Scheduling - Priorities – Deadline Scheduling - FIFO – RR – Quantum Size – SJF - SRT – HRN. Distributed Computing: Classification of Sequential and Parallel Processing– Array Processors – Dataflow Computers -Multiprocessing – Fault Tolerance.

UNIT – IV *(13 Hrs)*

Device and Information Management Disk Performance Optimization: Operation of Moving Head Disk Storage – Need for Disk Scheduling - Seek Optimization – FCFS – SSTF – SCAN – RAM Disks – Optical Disks.

File and Database Systems: File System – Functions – Organization – Allocating and Freeing Space – File Descriptor – Access Control Matrix.

UNIT – V   *(12 Hrs)*

LINUX: History of LINUX – Overview of LINUX: LINUX Goals – Interfaces to LINUX – The Shell – LINUX Utility Programs – Kernel Structure – Processes: Fundamental Concepts - Memory Management: Fundamental Concepts - File System: Fundamental Concepts - Security: Fundamental Concepts. WINDOWS: History – System Structure: Operating System Structure, The Kernel Layer.

Text Books:

1. H.M.Deitel (2003), **"Operating Systems",** Second Edition, Pearson Education Publ. (Unit I – Unit IV)
2. Andrew S.Tanenbaum (2006), "**Modern Operating System",** Third Edition Prentice Hall of India Pvt. Ltd., Delhi. (Unit V)

Reference Books:

1. Achyut S Godbole (2002), **"Operating Systems",** TMH Publications.
2. Abraham Silberschatz, Galvin, Gagne, (2004), **Operating Systems Concepts,** Sixth Edition, John Wiley & Sons.

Course Outcomes:

After completing this course, students will be able to:

➢ Remember the basic concepts of operating system.
➢ Understand the concepts like interrupts, deadlock, memory management and file management.
➢ Analyze the need for scheduling algorithms.
➢ Implement different algorithms used for representation, scheduling, and allocation in DOS and UNIX operating system.

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN JAVA	Hrs./Week	Credits
IV	21UITMP4		6	3

Course Objectives:

The students would be able to:

➢ Create a simple JAVA program with object-oriented programming principles.

➢ Create and manipulate objects, classes, graphics concepts, applet programming concepts.

➢ Create and manipulate interfaces and packages programming concepts.

➢ Emphasis event-driven programming methods.

➢ Design code and debug JAVA language programs.

MAJOR PRACTICAL LIST

1. Programs using Simple Java classes
2. Programs using arrays and control structures
3. Program using classes and objects
4. Program using Multiple Constructors
5. Program Using Simple inheritance
6. Program Using Multi Level Inheritance
7. Interfaces
8. Packages
9. Overloading and Overriding
10. Pre-Defined Exception handling
11. User Defined Exception handling
12. Multithreading programs
13. Simple Applet

Course Outcomes:

After completing this course, students will be able to:

➢ Remember the fundamentals of Java programming language

➢ Understand the multi-threaded programs and Exception handling

➢ Analyze and use Java in a variety of applications.

➢ Write and debug a software application developed using the Java programming language.

➢ Write and debug a simple applet program.

SKILLED BASED CORE PRACTICAL	Sub. Code	DESKTOP PUBLISHING	Hrs./Week	Credits
II	21UITS4A		4	4

Course Objective:

The students would be able to:

> ➤ Identify Page maker controls.
> ➤ Create and delete the documents.
> ➤ Identify Photoshop controls.
> ➤ Adding special effects.
> ➤ Apply different color scheme palette.

PageMaker

1) Design an ID card (3" * 2")
2) Design visiting card (3.5" * 2")
3) Design an invitation card
4) Design Letter Pad (7.5" * 9")
5) Prepare a small booklet with 3 pages (3.5" * 4.5")
6) Design a Hand bill (5.5" * 8.5")
7) Create an Advertisement
8) Prepare a Mark sheet
9) Create a Receipt Bill
10) Create a Graph

Photoshop

1) Design a brochure
2) Design a seasonal greetings card
3) Merging two images using layers
4) Design a textbook cover page
5) Crop/Rotate an Image

Course Outcomes:

After completing this course, students will be able to:

> ➤ Design eye catching flyers and ads.
> ➤ Demonstrate marketable desktop publishing skills.

- Apply a report template.
- Demonstrate the use of common shortcut keyboard commands.
- Import and resize images.

SKILLED BASED CORE PRACTICAL	Sub. Code	ANIMATION APPLICATIONS	Hrs./Week	Credits
II	21UITS4B		4	4

Course Objectives:

The students would be able to:

- ➢ Identify Flash controls.
- ➢ Identify Dreamweaver fundamentals.
- ➢ Import contents into web page.
- ➢ Create Website.
- ➢ Link web pages.

FLASH

1. Create a Simple Presentation.
2. End a Movie Clip using Script.
3. Start a graphic animation at a specific frame.
4. Text animation using motion tweening.
5. Activate a new window/page using buttons.
6. Bouncing ball with sound effect.
7. Scrolling Gallery.

DREAMWEAVER

1. Creating a New Dreamweaver Site.
2. Adding Images, Text and Links.
3. Flash Buttons and Flash Text.
4. Creating a Rollover Images.
5. Creating Tables – FAQs.
6. Designing Web Pages with Frames.
7. Inserting and Formatting a Table in Standard View.
8. Design navigation Bar with Images.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Analyze Flash controls.
- ➢ Analyze Dreamweaver fundamentals.

- ➢ Import contents into web page.
- ➢ Develop Website.
- ➢ Apply links in web pages.

ALLIED	Sub. Code	COMPUTER GRAPHICS	Hrs./Week	Credits
IV	21UITA41		4	4

Course Objectives:

The students would be able to:

➢ Gain a comprehensive introduction to computer graphics

➢ Understand contemporary terminology, progress, issues, and trends.

➢ Learn about the object hierarchy in graphics applications.

➢ Gain knowledge about 2D and 3D image processing techniques.

UNIT – I   *(10 Hrs)*

Overview of Graphic Systems – Display Devices – hard copy Devices – Interactive Input Devices – Display Processor – Graphic software – Output Primitives – Line Drawing Algorithms – Initializing Lines – Line command – fill areas – circle Generation Algorithms.

UNIT – II   *(12 Hrs)*

Attributes of output primitives – line style – color and Intensity – area filling algorithms – character Attributes – inquiry functions – bundled attributes – two dimensional transformations – basic and composite transformations – metric representations.

UNIT – III   *(13 Hrs)*

Windowing and Clipping – Windowing concepts – Clipping Algorithms – Window to view port Transformations – segments – Interactive input methods – Physical input devices – logical classification of input devices – interactive picture construction techniques – input functions.

UNIT – IV   *(12 Hrs)*

Three dimensional concepts – 3D Display Techniques – 3D representation – polygon and curved surface – 3D transformations.

UNIT – V   *(13 Hrs)*

3D viewing – projections – viewing transformation –Implementation of viewing operations – Hidden surface and Hidden Line removal – back free removal, depth buffer and scan line methods – shading.

Text Book:

1. Donald Hearn and M. Pualine Baker — Computer Graphics, PHI, 2nd Edition, 2002.

Reference Book:

1.William M.Neuman and Robert F Sproul — Principles of Interactive Computer Graphics, McGraw Hill International Edition, 2nd Edition, 2001.

Course Outcomes:

After completing this course, students will be able to:

- Demonstrate an understanding of contemporary graphics hardware.
- Implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.
- Implement visibility detection.
- Demonstrate 2D image processing techniques.

ALLIED PRACTICAL	Sub. Code	COMPUTER GRAPHICS Using C	Hrs./Week	Credits
IV	21UITAP4		4	2

Course Objectives:

The students would be able to:

- ➤ Measure the students understanding of the Computer Graphics techniques concepts and algorithm.
- ➤ Implement of line drawing, circle drawing, polygon drawing, transformation of objects, scaling, viewing, and curve designing and modeling algorithm practically for graphics.
- ➤ Think critically and creatively in order to come with an alternate solution for an existing problem with computer graphics.

Allied Practical List:

1. Implementation of Line Drawing Algorithms
2. Implementation of Circle Drawing Algorithms
3. Implementation of Ellipse Drawing Algorithms
4. Implementation of Output Primitives
5. Implementation of 2D Transformations
6. Implementation of Line Clipping Algorithms
7. Implementation of Polygon Clipping Algorithms

Course Outcomes:

After completing this course, students will be able to:

- ➤ Understand practical fundamental of line drawing, circle drawing, polygon drawing and curve drawing.
- ➤ Understand the concepts of different type of geometric transformation of objects in 2D.
- ➤ Understand the practical implementation of modeling, rendering, viewing of objects in 2D.
- ➤ Get knowledge about clipping algorithms
- ➤ Create Presentations using Multimedia tool.

NON MAJOR ELECTIVE	Sub. Code	FUNDAMENTALS OF INTERNET	Hrs./Week	Credits
II	21UITN4A		2	2

Course Objectives:

The students would be able to:

  ➢ Learn the basic concepts of internet.
  ➢ Get the knowledge about email operations.
  ➢ Gain the knowledge about WWW concepts.
  ➢ Know about e-commerce.
  ➢ Understand about the internet security.

UNIT – I *(5 Hrs)*

The Internet: Introduction – From Computers to the Internet - Advantages of the Internet – Major Internet Services – Hardware and Software in the Internet Age.
Evolution and Growth of the Internet: Birth of the Internet – Current Networking Technologies – Next Generation Networking.

UNIT – II *(6 Hrs)*

Getting Online: Types of Internet Accounts – Selecting Internet Service Providers –
Electronic Mail: Advantages of E-mails – E-mail addresses – Mail transfer protocols – Working of E-mail system.

UNIT – III *(6 Hrs)*

World Wide Web: Architecture of the World Wide Web – Types of websites – Uniform Resource Locator – Domain Name System – Web Pages and Web Links – Visiting Web Pages – Using Internet Explorer – Searching the Web – Google and Yahoo Search Engines.

UNIT – IV *(6 Hrs)*

Electronic Commerce: E-Business and E-Commerce – Types of business in the internet – MCommerce - Marketing Strategies on the Web – Making Payments in Virtual Stores – Shopping in Virtual Stores –Cookies and E-Commerce – Major issues of E-commerce and M-Commerce – Future of Ecommerce.

UNIT – V *(7 Hrs)*

Blogs and Social Networking: Blogs – Uses of Blogs – Blogs System Components – Steps for Blogging – Building a Blog site – Social Networking – Etiquette in networking sites.

Internet Security: Importance of Internet Security – Internet Threats – Identity theft and Cyber squatting – Hacking – Spamming and Spoofing – Phishing and Pharming – Denial of Service – spyware – Viruses and worms- Security solutions – Firewalls and Intrusion Prevention Systems –Internet Security Precautions- The Information Technology Act.

Text Book:

1. The Internet A User's Guide, Second Edition by K.L. James – PHI Learning Private Limited, 2010.

Reference Books:

1. Internet, World Wide Web, How to Program, 5th Edition, Paul Deital, Harvey M Deitel, Pearson, 2018.

Course Outcomes:

After completing this course, students will be able to:

- ➢ Understand the basic concepts of internet.
- ➢ Use email operations.
- ➢ Understand about WWW concepts.
- ➢ Understand about e-commerce.
- ➢ Gain overall knowledge about the internet security.

NON MAJOR ELECTIVE	Sub. Code	WEB DESIGN USING HTML	Hrs./Week	Credits
II	21UITN4B		2	2

Course Objectives:

The students would be able to

- ➢ Learn the features of HTML
- ➢ Knowledge about basic html tags
- ➢ Understand list and table tags
- ➢ Learn about web pages
- ➢ Gain knowledge about the DHTML

UNIT – I *(5 Hrs)*

Introduction to HTML: Designing a Home page – History of HTML – HTML generations- HTML Documents – Anchor tag – Hyperlinks – Sample HTML documents.

UNIT – II *(6 Hrs)*

Head and Body section: Header Section – Title – Colorful web page – Comments lines. **Designing the body:** Heading printing – Aligning the headings – Horizontal rule – Paragraph – Tab settings.

UNIT – III *(6 Hrs)*

Ordered and unordered lists: List – Unordered lists – headings in a list – ordered lists – Nested lists. **Table handling:** Tables – table creation in HTML – Width of the Tables and cells – Cells spanning multiple rows/Columns – Coloring cells.

UNIT – IV *(6 Hrs)*

Frames: Frameset - Definition – Frame definition –Nested Frames. **Forms:** Form tags – Form elements - Drop down list.

UNIT – V *(7 Hrs)*

DHTML and Style sheets: Defining styles – Elements of styles – Linking a style sheet to an HTML document – Inline styles – Internal & External style sheets – Multiple styles.

Text Book

1. World Wide Web Design with HTML, C. Xavier, TMH, 2001

Reference Book:

1. Internet & World Wide Web, H.M.Deital, P.J.Deital & A.B.Goldberg, Pearson Education, 2012.

Course Outcomes:

After completing this course, students would be able to

- ➢ Understand the features of HTML.
- ➢ Analyze the basic html tags.
- ➢ Familiarize list and table tags.
- ➢ Work with simple web pages.
- ➢ Understand features of DHTML.

CORE	Sub. Code	Relational Database Management	Hrs./Week	Credits
VII	21UITM51	System	4	4

Course Objectives:

The students would be able to:

  ➢ Design E-R modeling for a given situation and provide the foundation for development of relational database structure.
  ➢ Distinguish between different models of file organizing, storing and using of data.
  ➢ Understand the relational model and relational algebra operations.
  ➢ Normalize the relational tables applying normalization rules.
  ➢ Apply PL/SQL procedural interfaces statement on relational tables as per requirements.

UNIT – I   *(12 Hrs)*

Introduction: Database System Applications – Purpose of Database System. View Of Data: Data Abstraction – Instances and Schemas –Data Models – Relational Database – Database Design –The Entity Relationship model.

UNIT – II   *(12 Hrs)*

Storage And File Structure: Overview of physical storage media –Magnetic Disks – Tertiary Storage – Storage Access. File Organization: Fixed Length Records – Variable Length Records. Organization Of Records In Files: Sequential File Organization –Multi table Clustering File Organization – Data Dictionary Storage.

UNIT – III   *(12 Hrs)*

Relational Model: Structure of Relational Databases –Fundamental Relational Algebra Operation. Transactions: Transaction Concept –Transaction State – Implementation of Atomicity and Durability – Concurrent Execution-Serializability.

UNIT – IV   *(12 Hrs)*

SQL: Background – Data Definition- Basic Structure of SQL Queries – Set Operations – Aggregate Functions –Nested sub queries – Views – Joined Relations. Relational Database Design: Atomic Domain and First Normal Forms. Decomposition Using Functional Dependencies: Keys and Functional Dependencies – Third Normal Form
– Boyce Codd Normal Form.

UNIT – V   *(12 Hrs)*

Introduction Of Pl/Sql: Advantages of PL/SQL –The Generic PL/SQL Block. PL/SQL: Data types –Variables – Constants – Control Structures– Cursors – Exception Handling – Procedures and Functions –Packages –Triggers.

Text Books:

1. Abraham Silberschatz ,Henry F.Korth ,S.Sudarshan ,"Database SystemConcepts", 6th Ed., Tata McGraw –Hill, Singapore, 2013UNITS: I, II, III & IV
2. Ivan Bayross, "SQL & PL/SQL: The Programming Languages of Oracle",Fourth Revised Edition, BPB Publications, New Delhi, 2010. Unit: V

Reference Books:

1. C.J Date 'An Introduction to Database System", Pearson Education,New Delhi, 2005
2. P.S.Deshpande "SQL & PL/SQL for Oracle 10g", Dream TechPress,NewDelhi, 2007.

Course Outcomes:

After completing this course, students will be to:
- Demonstrate the basic elements of a relational database management system.
- Identify the data models for relevant problems.
- Design entity relationship and convert entity relationship diagrams.
- Demonstrate their understanding of key notions of query evaluation and optimization techniques.
- Extend normalization for the development of application softwares.

CORE	Sub. Code	**VISUAL PROGRAMMING**	Hrs./Week	Credits
VIII	**21UITM52**		**4**	**4**

Course Objectives:

The students would be able to:

> ➢ Understand Visual Basic's form designer to create user interfaces.
> ➢ Create dialogs, menus, windows and use Windows common dialogs.
> ➢ Create SDI and MDI applications.
> ➢ Develop modular, reusable Visual Basic code and forms.
> ➢ Connect to databases to insert, delete and edit records.
> ➢ Test and debug Visual Basic programs.

UNIT – I *(12 Hrs)*

Getting started with Visual Basic 6.0: Introduction to Visual Basic - Visual Basic 6.0 ProgrammingEnvironment – Working with Forms – Developing an Application – Variables, Data types and Modules –Procedures and Control Structures – Arrays in Visual Basic – Additional Examples.Working withControls: Introduction – Creating and using Controls – Working with Control Arrays.

UNIT – II *(12 Hrs)*

Menus, Mouse Events and Dialog Boxes: Introduction – Mouse Events – Dialog Boxes – additionalExamples. Graphics, MDI, and Flex Grid: Introduction – Graphics for Applications – Multiple Document Interface (MDI) – Using the Flex Grid Control.

UNIT – III *(12 Hrs)*

ODBC using Data Access Objects and Remote Data Objects: Open Database Connectivity (ODBC) –Remote Data Objects.

UNIT – IV *(12 Hrs)*

Object Linking and Embedding: Introduction - OLE Fundamentals – Using OLE Container Controls –Using OLE Automation Objects - OLE Drag and Drop - Additional Examples. Objects and Classes:Introduction to Objects – Working with Objects – Classes and Class Modules.

UNIT – V   *(12 Hrs)*

Working with ActiveX Data Objects: An Overview of ADO and OLE DB – ADO Object Model – AdditionalExamples. Files and File System Controls: Introduction – File System Controls – Accessing Files.

Text Book:
1. Visual Basic 6.0 Programming – Content Development Group – Tata McGraw-Hill Publishing CompanyLimited, New Delhi.

Reference Books:
1. VISUAL BASIC 6 in Record Time by Steve Brown, BPB Publications.
2. VISUAL BASIC 6 from the Ground UP – GARY CORNELL – Tata McGraw Hill.

Course Outcomes:

After completing this course, students will be able to:
➢ Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)
➢ Develop a Graphical User Interface (GUI) based on problem description
➢ Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events
➢ Develop and debug applications.
➢ Develop real time applications.

CORE	Sub. Code	COMPUTER NETWORKS	Hrs./Week	Credits
IX	21UITM53		4	4

Course Objectives:

The students would be able to:

➢ Educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.

➢ Familiar with the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.

➢ Introduce the student to a network routing for IP networks and how a collision occurs and how to solve it and how a frame is created and character count of each frame.

UNIT – I *(12 Hrs)*

Introduction - Uses of Computer Networks-Network Hardware-Network Software Reference Models–Example Networks-Network Standardization-Metric Units.

UNIT – II *(12 Hrs)*

The Physical Layer: The Theoretical basis for Data Communication – Guided Transmission Media -Wireless Transmission-The Public Switched Telephone Network-Cable Television.

UNIT – III *(12 Hrs)*

The Data Link Layer: Data Link Layer Design Issues-Error Detection and Correction-Elementary Data Link Protocols- -Multiple Access Protocols-Ethernet-Wireless LANS.

UNIT – IV *(12 Hrs)*

The Network Layer: The Network Layer Design Issues-Routing Algorithms-Congestion Control Algorithms-Internetworking-the Transport Layer: Elements of Transport Protocols-UDP-TCP.

UNIT – V *(12 Hrs)*

The Application Layer DNS - Electronic Mail - WWW - Multimedia. Network Security: Cryptography- Symmetric Key Algorithms, Public Key Algorithms, Digital Signatures Authentication Protocols –Communication Security- Web Security.

Text Book:

1. Andrew S Tanenbaum , Computer Networks, 6th Ed., Pearson Education 2009.

Reference Books:

1. B.Muthu Kumaran, Computer Networking, 3rd Ed., TMG 2009.
2. Behrouz A Forouzan, Data Communications and Networking', 4th Ed., TMH 2008.
3. Uyless Black, Data Networks: concepts theory and practices', 4th Ed PHI, 1998.

Course Outcomes:

After completing this course, students will be able to:

➢ Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.

➢ Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security.

➢ Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.

➢ Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.

CORE ELECTIVE	Sub. Code	DATA MINING	Hrs./Week	Credits
I	21UITM5A		4	4

Group – A: DATA MINING

Course Objectives:

The students would be able to:

- ➢ Understand the basic concepts and techniques of data mining.
- ➢ Identify the key processes of data mining, data warehousing and knowledge discovery process.
- ➢ Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses.
- ➢ Apply data mining techniques to solve problems in other disciplines in a mathematical way.

UNIT – I *(12 Hrs)*

Introduction: What is Data Mining – why Data Mining Now – The data Mining Process – Data Mining Applications – Data Mining Techniques – Practical examples of Data Mining – The Feature of Data Mining – Guidelines for Successful Data Mining – Data Mining Software.

UNIT – II *(12 Hrs)*

Association Rule Mining: Introduction – Basics – The Task and Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm – Apriori -TID – Direct Hashing and Pruning DHP-Mining Frequent Patterns without Candidate Generation – Performance Evaluation of Algorithms – Software for Association Rule Mining.

UNIT – III *(12 Hrs)*

Classification: Introduction – Decision Tree – Building a decision Tree- The Tree Induction Algorithm – Split Algorithm Based on the Information Theory – Decision Tree Rules – Decision tree summary – Naïve Bayes Method – Estimating Predictive Accuracy of classification Methods- Other Evaluation Criteria for classification methods – classification software.

UNIT – IV   *(12 Hrs)*

Cluster Analysis: What is Cluster Analysis – Desires Features of cluster analysis – – Types of cluster analysis methods – Partitioned Methods – Hierarchical Methods – Density Based MethodsDealing with Large Databases – cluster Analysis Software.

UNIT – V   *(12 Hrs)*

Web Data Mining: Introduction – Web Mining- Web Technology and characteristics – Locality and Hierarchy in the web – Web content Mining – Web Usage Mining – Web Structure Mining – Web Mining Software.

Text Book:

1. Introduction to Data Mining with Case studies, G.K. Gupta, PHI Third Edition, 2015

Reference Books:

1. Data Mining Concepts & Technologies, Jiawei Han, Michelinekamber, Morgan Kaufmann, Second Edition, 2005.
2. Data Mining, Vikram Pudi, P.Radha Krishna, Oxford University Press, First Edition, 2009.
3. Data Warehousing – Reema Thareja Oxford University Press – 2009.
4. Insight into Data Mining Theory and Practice – K.p. Soman, ShyamDiwakar, V.Ajay, Prentice Hall of India – 2008

Course Outcomes:

After completing this course, students will be able to:

➢ Understand the data extraction and transformation techniques.
➢ List the association rule mining techniques and understand association mining to correlation analysis, constraint based association mining.
➢ Understand operational database, warehousing and multidimensional need of data base to meet industrial needs.
➢ Understand the components of warehousing, classification methods and clustering analysis.
➢ Identify and understand the Business analysis, query tools and application, OLAP etc.

CORE ELECTIVE	Sub. Code	MOBILE COMPUTING	Hrs./Week	Credits
I	21UITM5A		4	4

Group – A: MOBILE COMPUTING

Course Outcomes:

The students will be able to:

➢ Understand an overview of Wireless Communication networks area and its applications in communication engineering.

➢ Understand the contribution of Wireless Communication networks to overall technological growth.

➢ Learn the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.

➢ Compare and contrast multiple division techniques, mobile communication systems, and existing wireless networks.

UNIT – I *(12 Hrs)*

Mobile Computing-Mobile Vs Wireless Networking-Mobile Computing Applications-Characteristics of Mobile computing-Structure of Mobile computing application. MAC protocols-Wireless MAC Issues-Fixed Assignment Schemes-Random Assignment Schemes-Reservation Based Schemes.

UNIT – II *(12 Hrs)*

Overview of Mobile IP-Features of Mobile IP-Key Mechanism in Mobile IP- Route optimization.Overview of TCP/TP-Architecture of TCP/IP-Adaptation of TCP window.

UNIT – III *(12 Hrs)*

Global System for Mobile Communication (GSM) - General Packet Radio Service (GPRS)-Universal Mobile Telecommunication System(UMTS)

UNIT – IV *(12 Hrs)*

Ad-hoc basic concepts-Characteristics –Applications-Design Issues-Routing-Essential of Traditional Routing Protocols-Popular Routing Protocols.

UNIT – V   *(12 Hrs)*

Mobile Device Operating systems-Special Constraints and Requirements-Commercial Mobile Operating Systems-Software Development Kit:iOS,Android,Blackberry,Window Phone-M-commerce-Structure-Pros & Cons-Mobile Payment System.

Text Book:

1. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", Learning Pvt.Ltd, New Delhi-2012

Reference BookS:

1. JochenH.Schller, "Mobile Communications",SecondEdition,Pearson Education,Newdelhi,2007.
2. C.K.Toh, :AdHoc Mobile Wireless Networks",FirstEdition,Pearson Education,2002.

Course Outcomes:

After completing this course, students will be able to:

➢ Understand fundamentals of wireless communications.
➢ Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
➢ Demonstrate basic skills for cellular networks design.
➢ Apply knowledge of TCP/IP extensions for mobile and wireless networking.

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN ORACLE	Hrs./Week	Credits
V	21UITMP5		6	3

Course Objectives:

➢ Educate the fundamental concepts of Data Base Design, Data Models, Different Data Base Languages (SQL/Oracle).

➢ Understand Unary & Binary table operations.

➢ Analyze Data Base design methodology and DB connectivity.

MAJOR PRACTICAL LIST

1. Creating, Modifying and Describing Tables.
2. Inserting, Modifying and Deleting Rows.
3. Retrieving Records/Rows from the Table.
4. Retrieving Records from Multi Tables using Joins.
5. Retrieving Records using Set Operators.
6. Creating Views.
7. Creating Sequences and Synonyms.
8. PL/SQL Programs with Control Structures.
9. PL/SQL Programs with Looping Structures.
10. PL/SQL Programs with Cursors and 'for loop' Cursors.
11. Creating and Calling Packages
12. Working with Triggers.

Course Outcomes:

After completing this course, students will be able to:

➢ Brief knowledge about SQL Fundamentals.

➢ Handle with different Data Base languages.

➢ Table View, Log & Triggers.

➢ Handle online Transactions.

➢ Database connectivity with front-end.

CORE PRACTICAL	Sub. Code	VISUAL PROGRAMMING LAB	Hrs./Week	Credits
VI	21UITMP6		6	3

Course Objectives:

The students would be able to:

➢ Understand an overview of computers and computer programming.

➢ Illustrate Visual Basic applications

➢ Identify how to perform operations and store results.

➢ Analyze the concept of data-driven program execution flow control in Visual Basic programming.

➢ Evaluate additional Visual Basic controls

MAJOR – PRACTICAL LIST

1. Program to perform all arithmetic operations.
2. Program to show the use of combo box.
3. Program to show the use of check box and option button.
4. Program to load an image at run time.
5. Program to create menu bar.
6. Program to print the result of student with total marks and percentage.
7. Program to calculate the salary of an employee.
8. Program to create a database application.
9. Display the items using Database.
10. Create an application using Navigation

Course Outcomes:

After completing this course, students will be able to:

➢ Describe Visual Basic.

➢ Create a project.

➢ Build variables and option explicit.

➢ Compose Code nested If-Else statements to make complex decisions.

➢ Apply the Frame control.

CORE	Sub. Code	PROGRAMMING IN .NET	Hrs./Week	Credits
X	21UITM61		4	4

Course Objectives:

The students would be able to:

➢ Learn .NET Framework and describe some of the major enhancements to the new version of Visual Basic.

➢ Gain knowledge the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE).

➢ Understand the applications using Microsoft Windows Forms.

➢ Learn the applications that use ADO. NET

UNIT – I   *(12 Hrs)*

The .Net Framework: Learning the .Net languages – Introduction to ASP.Net and IIS-ASP.Net Application.

UNIT – II   *(12 Hrs)*

Web Form Fundamentals: HTML controls – Web controls – Validation controls – Data Controls – AdRotator Controls - Login Controls – User Controls.

UNIT – III   *(12 Hrs)*

State Management: Session – View – Query String – Cookies – Tracing – Logging – Error Handling.

UNIT – IV   *(12 Hrs)*

ADO.NET: Overview of ADO.NET – ADO.NET Access – Data Binding – Data List- Data Grid and Repeaters – Working with Database.

UNIT – V   *(12 Hrs)*

XML: Using XML – XSD – XSLT.

Text Books:

1. Mathew Mac. Donald, "ASP.NET, The Complete Reference", Tata McGraw – Hill Publishing Company Ltd New Delhi.
2. Imar Spanjaars, "ASP.NET 3.5 in C# and VB", Wiley India Pvt. Ltd.

Reference Books:

1. O'REILLY, Jesse Liberty, Dan Hurwitz and Brain Mac Donald, "Learning ASP.NET 3.5", II Edition.

Course Outcomes:

After completing this course, students will be able to:

➢ Understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.
➢ Describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE).
➢ Create applications using Microsoft Windows Forms.
➢ Create applications that use ADO. NET

CORE	Sub. Code	INTERNET SECURITY	Hrs./Week	Credits
XI	21UITM62		5	4

Course Objectives:

The students would be able to:

➢ Learn the basic concepts of computer security.

➢ Know the different classes of attack in security.

➢ Make the students to get familiarized with firewalls, proxy servers & cryptography.

➢ Get knowledge will be obtained in internet security attacks, cryptography concepts.

UNIT – I   (12 Hrs)

Introduction: Why require a security? – Picking a Security Policy – Strategies for a Secure Network – The Ethics of Computer Security – Security Threats and levels – Security Plan (RFC 2196).

UNIT – II   (12 Hrs)

Classes of Attack: Stealing Passwords – Social Engineering – Bugs and Backdoors – Authentication Failures – Protocol Failures: Information Leakage – Exponential Attacks – Viruses and Worms – Denial – of – Service Attacks – Botnets – Active Attacks.

UNIT – III   (12 Hrs)

Computer Security: What are Viruses, Trojan horse, and Worms? – How to protect the computer against virus – What is the Structure of Viruses?

UNIT – IV   (12 Hrs)

Firewalls and Proxy Servers : Kinds of Firewalls : Packet Filters – Application – Level Filtering – Circuit – Level Gateways – Dynamic Packet Filters – Distributed Firewalls – What Firewalls Cannot Do – Filtering Services : Reasonable Services to Filter – Digging for Worms – Packet – Filtering – Implementing Polices (Default allow, Default Deny) on Proxy.

UNIT – V   (12 Hrs)

Cryptography: Introduction to Basic Encryption and Decryption, Diffie – Hellman Key Exchange – Concept of Public Key and Private Key – Digital Signatures.

Text Book:

1. William R. Cheswick, Steven M. Bellovin and Aviel D. Rubin, "Firewalls and Internet Security: Repelling the Wily Hacker", Second Edition, Pearson Education.

Reference Books:

1. Speed, "Internet Security: A Jumpstart for Systems Administrators and IT Managers", Elsevier India.
2. Behrouz Forouzan, "Cryptography and Network Security E/2", Tata McGraw Hill Education.

Course Outcomes:

After completing this course, students will be able to:

➢ Analyze the concepts of computer security.
➢ Analyze the different classes of attack in security.
➢ Familiarize with firewalls, proxy servers & cryptography.
➢ Implement internet security attacks, cryptography concepts.

CORE	Sub. Code	SOFTWARE ENGINEERING	Hrs./Week	Credits
XII	21UITM63		5	4

Course Objectives:

The students would be able to:

➢ Understand the basic theory of software engineering.

➢ Apply these basic theoretical principles to a group software development project.

➢ Apply standard coding practices.

➢ Apply different testing and debugging techniques and analyzing their effectiveness.

UNIT – I *(12 Hrs)*

Software-Characteristics, Classification, Software Engineering: Definition,Comparison with other disciplines, Phases in Software Engineering, Challenges, Software Process, Project, Product - Components of Software process ,processframework, process assessment , Software Life Cycle Models , Selection criteria, Process change management, Quantitative process management

UNIT – II *(12 Hrs)*

Software Requirements – Definition, Types, Requirement Engineering process, Feasibility Study -Types of feasibilities, Process Requirements Elicitation - techniques, Requirements Analysis –Structured Analysis, Object Oriented Modeling, Requirements Specification –Structure of SRS, Requirements Validation , Requirements Management

UNIT – III *(12 Hrs)*

Software Design – basic principles, concepts , Data design , Data Architectural design, Componentlevel design , User Interface design ,Pattern based Software design, Design Notations, DesignReviews – types, process, evaluating reviews, Software Design Documentation,Software Coding – features, guidelines, Methodology, Programming practices, Verificationtechniques, documentation

UNIT – IV *(12 Hrs)*

Software Testing - basics, guidelines, characteristics, Test Plan – steps in development, Software testing strategies, Levels of Software testing – Unit, Integration, System, Acceptance, Testing Techniques (basic idea of black box and white box testing), Object Oriented testing, Debugging, Software test report, Software Maintenance – basics, Legacy Systems, factors affecting maintenance, types of maintenance, Life cycle

UNIT – V *(12 Hrs)*

Software Planning and Scheduling – project planning, planning process, project plan, Project Scheduling – principles, techniques, Project staffing, Risk management, Software Quality – Concepts, Quality Assurance Activities, Software reviews, Evaluation.

Text Book:

1. Software Engineering Principles And Practices By Rohit, Khurana, Vikas Publishing House Pvt. Ltd. 2nd Edition, 2010

Reference Books:

1. Software Engineering A Practitioners Approach By ROGER S, Pressman 6th Edition Mcgraw Hill International Edition,2005
2. Rajib Mall, Fundamentals of Software Engineering, PHI,3rd Edition,2009

Course Outcomes:

After completing this course, students will be able to:

➢ Select and implement different software development process models
➢ Extract and analyze software requirements specifications for different projects
➢ Develop some basic level of software architecture/design
➢ Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.
➢ Identify and implement of the software metrics

CORE ELECTIVE	Sub. Code	CLOUD COMPUTING	Hrs./Week	Credits
II	21UITM6A		5	4

Course Objectives:

The students would be able to:

 ➢ Understand the basic knowledge about the cloud computing techniques and architecture.
 ➢ Learn the presents cloud computing collaborations and applications.
 ➢ Impart the new concept of various virtualization in cloud computing
 ➢ Gain knowledge of cloud services and cloud security.

UNIT – I   *(12 Hrs)*

Cloud Computing Overview- Applications – Intranets and the cloud – Why Cloud Computing Matters – Benefits – Limitations – Companies in the Cloud Today – Cloud Services.

UNIT – II   *(12 Hrs)*

Hardware and Infrastructure – Clients – Security- Network – Services – Accessing the Cloud - Platforms – Web Applications – Web APIs –Web Browsers –Cloud Storage – Overview – Cloud Storage Providers –Standards – Application – Client – Infrastructure – Service.

UNIT –III   *(12 Hrs)*

Software as a service – Overview – Driving Forces – Company offerings – Industries – Software plus Services – Overview - Mobile Device Integration –Providers – Microsoft Online.

UNIT –IV   *(12 Hrs)*

Google – Microsoft – Intuit Quick Base – Cast Iron Cloud – Bungee Connect - Local clouds and Thin Clients – Virtualization – Server Solutions – Thin Clients.

UNIT –V   *(12 Hrs)*

Cloud Services for Individuals – Cloud services aimed at the mid-market –Enterprise Class Cloud Offerings – Migration.

Text Book

1. "Cloud Computing: A Practical Approach", Velte T. Antony, Velte J. Toby. And Elsen Peter Robert (2010), Tata McGraw- Hill.

Reference Books:

1. Miller Michael (2008), "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing.
2. Beard Haley (2008), "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pvt. Limited.

Course Outcomes:

After completing this course, students will be able to:

➢ Understand the concepts of cloud Architecture and its services.
➢ Classify different services providers and its services, tools.
➢ Demonstrate various web based applications for collaborating everyone in the cloud computing.
➢ Analyze the best service provider for cloud computing in terms of storage, services.

CORE ELECTIVE	Sub. Code	CRYPTOGRAPHY AND NETWORK SECURITY	Hrs./Week	Credits
II	21UITM6B		5	4

Course Objectives:

The students would be able to:

> ➤ Explain the basics of number theory and compare various encryptiontechniques.
> ➤ Understand the manner in which message Authentication code andhash function work and the functionality of public key cryptography.
> ➤ Familiarize in intrusion detection and firewall design
> ➤ Examine the different types of security systems and applications.
> ➤ Recognize various security policies.

UNIT – I   *(12 Hrs)*

Network Security: Security Trends - The OSI Architecture – SecurityAttacks – Security Services - Security Mechanisms - A model for NetworkSecurity.Classic EncryptionTechniques: Symmetric Cipher Model- Substitution Techniques – Transposition techniques - Rotor Machines -Steganography.

UNIT – II   *(12 Hrs)*

Block Ciphers and Data Encryption Standards: Block Cipher-Principles – Data Encryption Standard - The strength of DES –Differentialand Linear Cryptanalysis – Block Cipher design principles –AdvancedEncryption Standard: The AES Cipher.

UNIT – III   *(12 Hrs)*

Public Key Encryption And Digital Signatures: Principles ofPublic Key Crypto Systems - The RSA algorithm. Message Authentication:Authentication Requirements - Authentication Functions – MessageAuthentication codes - Hash Functions - Security of Hash Functions andMAC. Digital Signatures: Authentication Protocols.

UNIT – IV   *(12 Hrs)*

Authentication Applications: Kerberos - X.509 AuthenticationService – PKI. Electronic Mail Security: Pretty Good Piracy - S/MIME. WEB SECURITY: Web Security Considerations- - SSL and TransportLayer Security.

UNIT – V   *(12 Hrs)*

System Security: Intruders - Intrusion Detection – PasswordManagement. Firewalls: Firewall Design Principles - Trusted Systems.

Text Book:

1. William Stallings, "Cryptography and network Security - Principles andPractices", Prentice Hall (Pearson Education), 7th Ed., 2016.

Reference Books:

1. AtulKahate, "Cryptography and Network Security", Tata McGraw HillPublications, New Delhi, 2009.
2. Charles P. Pfleeger, Shari L. Pfleeger, "Security in Computing", PrenticeHall, 5th Ed., 2015.

Course Outcome:

After completing this course, students will be able to:

➢ Provide security of the data over the network.
➢ Do research in the emerging areas of cryptography and network security.
➢ Implement various networking protocols.
➢ Protect any network from the threats in the world.
➢ Discuss different levels of security and services.

MAJOR PRACTICAL	Sub. Code	PROGRAMMING IN .NET	Hrs./Week	Credits
VII	21UITMP7		6	3

Course Objectives:

The students would be able to:

➢ Gain programming knowledge in .Net Framework.

➢ Introduce to .Net IDE Component Framework.

➢ Learn Programming concepts in .Net Framework.

➢ Create website using ASP.Net Controls.

MAJOR PRACTICAL LIST

1. Arithmetic Operations Using Text Box and Button.
2. Adding and Removing Items in runtime using Drop down list and List Box.
3. Upload and display Image using File Upload Control.
4. Display Date, Day, Month, Year, Day of Week, and Day of the Year using Calendar Control.
5. Create an Advertisement using Ad Rotator Control.
6. Create a Registration form and apply ASP.NET Validation Controls.
7. Binding data in Grid View using source.
8. Create Small pay roll.
9. Create User control with source.
10. Create a Login page using Session variable.
11. Gridview Edit, Update, Cancel and Delete using source.
12. Create a Crystal Report.
13. Write a program that binds the properties ID, Name, Price and Quantity of a page to the following values: ID: 10 Name: Wheat Price: 14.25 Quantity: 1000

Course Outcomes:

After completing this course, students will be able to:

➢ Create user interactive web pages using ASP.Net.

➢ Create simple data binding applications using ADO.Net connectivity.

➢ Perform Database operations for Windows Form and web applications.

CORE	Sub. Code	MAJOR PROJECT	Hrs./Week	Credits
			5	3

Course Objectives:

The students would be able to:

➢ Understand and select the task based on their core skills.

➢ Get the knowledge about analytical skill for solving the selected task.

➢ Get confidence for implementing the task and solving the real time problems.

During this semester the students are expected to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. Also during this semester,the students are expected to complete the project and submit a full-fledged report comprising of the complete system developed along with implementation and test results.

The departmental committee shall examine the students for 50% of marks and the evaluation is based on continuous internal assessment comprising of two reviews.

After two reviews internal 50% of marks (is based on seminar(20% marks) demo(20% marks) and Internal viva-voce (10 %marks)) will be given by the guide. At the end of the semester, a viva-voce examination will be conducted for 50% of marks.

Course Outcomes:

➢ Identify and formulate the problem

➢ Analyze the problem and collect necessary data.

➢ Design and develop the project using appropriate software by applyingthe programming skills.

➢ Implement, evaluate and generate reports.

PROGRAMME OUTCOMES (PO)

PO1 Understand the basic concepts, fundamental principles and scientific theories thatare needed for higher learning and research.

PO2 Identify, formulate and analyze the complex situations to arrive acceptablesolutions by applying domain specific knowledge, acquired through theprogramme.

PO3 Learn moral and ethical values and commit to professional ethics andresponsibilities in the associated disciplines. Exercise social concern with theability to act with awareness of issues in diversified domains to participate in thenational development.

PO4 Ability to design, implement and evaluate a computational system to meet thedesired needs within realistic constraints.

PO5 Realize the need for self and life-long learning to move along with the scientificand technological developments.

PO6 Ability to communicate and engage effectively with diverse stakeholders.

PO7 Analyze the impacts of computing on individuals, organizations and society.

PO8 Acquire skills of observing and drawing logical inferences from the scientificfacts.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1 Impart the core knowledge in the areas such as Software Engineering, DataCommunication, Networking and Security, Database Management, WebDesigning Technology, Operating System and other emergingareas in Computer Science.

PSO2 Provide well trained professionals to industries by enhancing the programmingskills and new computing technologies through theoretical and practicalknowledge.

PSO3 Train to solve real world problems by selecting appropriate techniques andbest logic.

PSO4 Enhance the ability to design and develop software applications, to understandthe basic concepts of hardware and to comprehend and apply mathematical principles.

PSO5 Make use of Computer Science techniques to one's own work as a member ora leader in a team to arrive conclusions and carryout projects.