HAJEE KARUTHA ROWTHER HOWDIA COLLEGE (AUTONOMOUS)

B.Sc., Information Technology :Syllabus (2017-2018 onwards)

Sem	Part	Subject	Code	Title of The Paper	Hour	Credits	Internal	External	Total
I	I	Lang	17UTAL11/ 17UARL11/ 17UMAL11	Tamil/Arabic/Malayalam	6	3	25	75	100
	II	Lang	17UENL11	English	6	3	25	75	100
	III	Core	17UCTC11	Programming In C	6	4	25	75	100
	III	Core	17UCTC1P	Programming In C – Lab	6	4	40	60	100
	III	Allied	17UCTA11	Mathematical Foundations	4	4	25	75	100
	IV	NME	17UCTN11	Introduction to IT	2	2	25	75	100
Total					**30**	**20**	**165**	**435**	**600**
Sem	**Part**	**Subject**	**Code**	**Title of The Paper**	**Hour**	**Credits**	**Internal**	**External**	**Total**
II	I	Lang	17UTAL21/ 17UARL21/ 17UMAL21	Tamil/Arabic/Malayalam	6	3	25	75	100
	II	Lang	17UENL21	English	6	3	25	75	100
	III	Core	17UCTC21	Object Oriented Programming With C++	5	4	25	75	100
	III	Core	17UCTC2P	Programming With C++ Lab	5	4	40	60	100
	III	Allied	17UCTA21	Resource Management Technique	4	4	25	75	100
	IV	NME	17UCTN21	Internet and Web Programming	2	2	25	75	100
	IV	SBS	17UCTS2P	Office Automation–Lab	2	2	25	75	100
Total					**30**	**22**	**190**	**510**	**700**

Sem	Part	Subject	Code	Title of The Paper	Hour	Credits	Internal	External	Total
III	I	Lang	17UTAL31/ 17UARL31/ 17UMA31	Tamil/Arabic/Malayalam	6	3	25	75	100
	II	Lang	17UENL31	English	6	3	25	75	100
	III	Core	17UCTC31	Java Programming	4	4	25	75	100
	III	Core	17UCTC32	Digital Principles and Applications	4	4	25	75	100
	III	Core	17UCTC3P	JAVA Programming –Lab	4	3	40	60	100
	III	Allied	17UCTA31	Computer Oriented Numerical Methods	4	4	25	75	100
	IV	SBS	17UCTS3P	Visual Programming –Lab	2	2	25	75	100
Total					**30**	**23**	**190**	**510**	**700**

Sem	Part	Subject	Code	Title of The Paper	Hour	Credits	Internal	External	Total
IV	I	Lang	17UTAL41/ 17UARL41/ 17UMA41	Tamil/Arabic/Malayalam	6	3	25	75	100
	II	Lang	17UENL41	English	6	3	25	75	100
	III	Core	17UCTC41	Relational Database Management Systems	4	4	25	75	100
	III	Core	17UCTC42	Data Structures And Algorithms	4	4	25	75	100
	III	Core	17UCTC4P	Relational Database Management Systems –Lab	4	3	40	60	100
	III	Allied	17UCTA41	Statistics and Aptitude	4	4	25	75	100
	IV	SBS	17UCTS4P	Mobile Application Development –Lab	2	2	25	75	100
Total					**30**	**23**	**190**	**510**	**700**

Sem	Part	Subject	Code	Title of The Paper	Hour	Credits	Internal	External	Total
V	III	Core	17UCTC51	DOT NET Technologies	6	4	25	75	100
	III	Core	17UCTC52	Operating Systems And System Software	6	4	25	75	100
	III	Core	17UCTC5P	DOT NET Programming– Lab	5	4	40	60	100
	III	Core	17UCTC5Q	Unix And Shell Programming –Lab	5	4	40	60	100
	III	Elective core	17UCTE51	Computer Graphics	4	4	25	75	100
			17UCTE52	Information Security					
			17UCTE53	Embedded Systems					
	IV	SBS	17UCTS51	Python – Lab	2	2	25	75	100
	IV	EVS	17UEVS51	Environmental Studies	2	2	25	75	100
Total					**30**	**24**	**205**	**495**	**700**

Sem	Part	Subject	Code	Title of The Paper	Hour	Credits	Internal	External	Total
VI	III	Core	17UCTC61	Software Engineering	5	4	25	75	100
	III	Core	17UCTC62	Computer Networks	5	4	25	75	100
	III	Core	17UCTC63	Data Mining	4	4	25	75	100
	III	Core	17UCTC6P	Web Technology –Lab	5	4	40	60	100
	III	Core	17UCTC6T	Project Work	5	4	40	60	100
	III	Elective core	17UCTE61	Web Technology	4	4	25	75	100
			17UCTE62	Artificial Intelligence And Expert Systems					
			17UCTE63	Grid Computing					
	IV	VE	17UVED61	Value Education	2	2	25	75	100
	V	EA		Extension Activities		2			100
Total					**30**	**28**	**205**	**495**	**800**
Total					**180**	**140**	**1145**	**2955**	**4200**

Year : First	CORE PAPER	Semester : I
Hours : 6	17 UCTC11 – PROGRAMMING IN C	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students have the programming ability in C Language

UNIT I

Overview of C: History of C - Importance of C - Basic Structure of C - Programming Style. Contents, Variables and Data Types - Declaration of Variables, Storage Class- Defining Symbolic Constants- Declaring a Variable as Constant, Volatile - Overflow and Underflow of Data.

Operator and expressions: Arithmetic, Relational, Logical, Assignment Operators Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators- Arithmetic Expression- Evaluation of Expressions- Precedence of Arithmetic Operators – Type Conversions in Expression – Operator Precedence and Associatively – Mathematical Functions .

Managing I/O Operations: Reading and Writing a Character – Formatted Input, Output.

UNIT II

Decision Making and Branching: If Statement, If… Else Statement - Nesting of If….Else Statement – Else..If Ladder - Switch Statement – The ?: Operator - Goto Statement.

Decision making and Looping: The While Statement – Do Statement – The For Statement – Jumps in Loops.

UNIT III

Arrays: One Dimensional Array – Declaration, Initialization – Two Dimensional Arrays – Multi Dimensional Array – Initialization. Dynamic Arrays.

Strings: Declaration, Initialization of String Variables – Reading and Writing String – Arithmetic Operations on Strings – Putting Strings Together – Comparison – String Handling Function – Table of String – Features of String.

UNIT IV

User Defined Functions: Need – Multi Function Program – Elements of User Defined Functions – Definition – Return Values and their Types – Function Calls, Declaration, Category of all Types of Arguments and Return Values – Nesting of Functions – Recursion – Passing Arrays ,Strings to Functions – Scope Visibility and Life Time of Variables – Multi File Programs.

Structure and Unions: Introduction - Defining Structure – Declaring Structure Variables – Accessing Structure Members – Initialization – Union.

UNIT V

Pointers: Introduction – Understanding Pointers – Accessing the Address of a Variable – Declaring Pointers Variables – Initialization of Pointer Variables – Accessing a Variable Through its Pointer.

Files: Defining Opening, Closing a File. I/O Operation on Files – Error Handling During I/O Operations – Random Access to File – Command Line Arguments.

Text Book:

1. **"Programming in ANSI C",** E. Balagurusamy, 6th Edition, TMH Company.

UNIT I	Chapters 1 to 4.
UNIT II	Chapters 5 and 6.
UNIT III	Chapters 7 and 8.
UNIT IV	Chapters 9,10.1 to 10.5 and 10.12
UNIT V	Chapters 11.1 to 11.6 and12

Reference Book:

1. **"Programming in C",** Byson.S.Gottfied, Schaums Outline Series, 2ndEdition, TMH, 2008.

2. **"The C Programming Language",** Kernighan B.W. & Ritchie.D.M., Prentice Hall of India, 2nd Edition 2002.

Year : First	CORE PAPER	Semester : I
Hours : 6	17UCTC1P – PROGRAMMING IN C – LAB	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students have the programming ability in C Language .

1. Write a program to evaluate area of triangle using the formula sqrt (s(s–a) (s–b) (s–c))
2. Write a program to swap two numbers.
3. Write a program to find the greatest of three numbers and print the numbers in ascending Order.
4. Write a program to perform the arithmetic expression using switch statement.
5. Write a program to find a factorial of given number using do while statement.
6. Write a program to print all prime numbers up to 'N' numbers.
7. Write a program to print sum of 'N' natural numbers.
8. Write a program to find the total number of even integers and odd integers of 'N' numbers.
9. Write a program to find the sum of odd numbers and even numbers upto 'N' numbers.
10. Write a program to print the product of two matrices of any order.
11. Write a program to read 'N' number of students with 5 subject marks.
12. Write a program to find greatest of 'n' numbers using functions.
13. Write a program to print Fibonacci series using recursion.
14. Write a program to convert all lower case to uppercase characters.
15. Write a program to sort 5 city names in alphabetical order.
16. Write a program to implement the concept of structure and union.
17. Write a program to access a variable using pointer.
18. Write a program to display student information by initializing structures.
19. Write a program to write integer data into file and read it from file.
20. Write a program to pass structure as arguments to function and calculate total marks of 5 Subjects.

Year : First	ALLIED PAPER	Semester : I
Hours : 4	17UCTA11 – MATHEMATICAL FOUNDATIONS	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students should have: - Understanding the concepts of discrete mathematics - Learning applications of discrete structures in Computer Science.

UNIT I

Set theory: Relations, Equivalence Relations – Partial Order – Functions – Binary Operations – Group: Definitions and Examples – Elementary Properties.

UNIT II

Logic: Introduction – Connectives – Truth Table – Tautology Implication and Equivalence of Formulae.

UNIT III

Matrices: Elementary Transformation – Inverse of a Matrix – Rank of a Matrix– Simultaneous Linear Equation – Cayley Hamilton Theorem.

UNIT IV

Graph Theory: Introduction – Definition and Examples – Degrees and Sub graphs – Matrices – Connectedness: Walks, Trails and Paths, Connectedness and Components.

UNIT V

Eulerian Graphs – Hamiltanion Graphs – Trees: Characterization of Trees – Centre of Tree.

Text Book:

1. **"Modern Algebra",** by S.Arumugam & A. Thangapandi Isaac , A.Somasundrram. – Unit I & III.
2. **"Discrete Mathematics"** by Dr.M.K.Venkaatraman,Dr.N.Sridharan, Dr.N.Chandresekaran. – Unit II.
3. **"Invitation to Graph theory"** by S.A.Ramachandran, Scitech Publication,2005,Chennai. – Unit IV & V.

Year : First	**NME PAPER**	**Semester : I**
Hours: 2	**17 UCTN11 – INTRODUCTION TO IT**	**Credits : 2**

COURSE OUTCOME:

On successful completion of the subject the students well known about the computer industry, all types of computers and its components.

UNIT I

Information Technology : Introduction – Information System – Software and Data – IT in Business and Industry – The Home and At Play – Education and Training – Entertainment and the Arts – Science, Engineering and Math – Computers in hiding.

UNIT II

Types of Computers: Corporate and Departmental Computers – Desktop and Personal Computer – The Anatomy of Computer – Binary Number – Digital Signals – The Binary Code. The CPU – Memory RAM and ROM – Other Forms and Use of Memory.

UNIT III

Input and Output: I/O Devices – Inputting Text: Keyboards – Direct Input Devices – Inputting Graphics – Pointing Devices – Pixels and Resolution – Fonts – Range of Colors – Display screen: Types of Screens – Resolution – Printers.

UNIT IV

Secondary Storage: How Data is Stored – Storage Characteristics – Floppy Disks – Hard Disk Drives – Optical Discs – Increasing Data Storage Capacity – Backing Up Your Data – The smart Card. Software: User Interface – Application Programs – Operating Systems.

Unit V

Internet and World Wide Web: Introduction – The web – Getting Connected to the Web – Browsing the Web – Locating the Information on the Web – Web Multimedia.

Text book:

1. **"Information Technology The breaking Wave"** Dennis P.Curtin, Kim Foley, Kunal Sen, Cathileen Morin. – TMH edition.

Reference:

1. **"Computer's Today",** Basantra Galgotia publications.
2. **"Computer's & Commonsense",** Roger hunt.

Year : First	CORE PAPER	Semester : II
Hours : 5	17UCTC21 – OBJECT ORIENTED PROGRAMMING WITH C++	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students should have: the knowledge on Object-oriented programming concepts using C++.

UNIT I

Object Oriented Programming concepts: Basic Concepts of OOPs – Structure of C++ Program – Tokens – Keywords – Identifiers – Constants – Basic Data Types – User Defined Data Types – Derived Data Types – Declaration of Variables – Reference Variables – Manipulators – Expression and its Types – Control Structures.

UNIT II

Functions: Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Function – Function Overloading – Default arguments.

Classes and Objects: Specifying the Class – Defining Member Function – A C++ Program with Class – Static Members – Arrays of Objects – Friend Functions.

UNIT III

Constructor and Destructor: Constructors–Parameterized Constructor – Multiple Constructor in a Class – Copy Constructor – Destructor. Operator Overloading – Defining Operator Overloading – Overloading Unary Operator – Overloading Binary Operator – Using Friend Function – Rules for Overloading Operators.

UNIT IV

Inheritance: Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointers to the Object – this Pointers – Pointer to Derived Classes – Virtual Function and Polymorphism – Pure Virtual Function.

UNIT V

Managing Console I/O Operations: C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End – of File – File Modes.

Text Book:

1. E. Balagurusamy, **"Object Oriented Programming With C++"**, 3rd Edition, TataMcGraw Hill Publications,New Delhi.
   Unit I to V Chapters 1 to 11

Reference:

1. Robert Lafore, **"Object–Oriented Programming in Turbo C++",** Galgotia Publications ,New Delhi.
2. Herbert schildt, **"C++ The complete References",** 4th edition, TMH.

Year : First	**CORE PAPER**	**Semester : II**
Hours : 5	**17UCTC2P – PROGRAMMING WITH C++ LAB**	**Credits : 4**

COURSE OUTCOME:

On successful completion of this subject the students have the programming ability in C++ Language

1. Write a C++ Program Book Entry Using structure Variable
2. Write a C++ Program for Binary Operator Overloading
3. Write a C++ Program for Constructor
4. Write a C++ Program for Copy Constructor
5. Write a Program for Exception Handling Divide by zero
6. Write a Program for Exception Handling with Multiple Catch
7. Write a C++ Program for Friend Function
8. To write a program to add two complex numbers using binary operator overloading.
9. To calculate the area of circle, rectangle and triangle using function overloading.
10. To write a program to add, Subtract and multiplications of two matrix.
11. To write a program to transpose matrix
12. Write a C++ Program for single and Multiple Inheritance
13. Write a C++ Program for Read & Write File Operation (Convert lowercase to Uppercase)
14. Write a C++ Program for Static Data and Member Function
15. Write a C++ Program to create a File and to display the contents of that file with line numbers

Year : First	ALLIED PAPER	Semester : II
Hours : 4	17UCTA21 – RESOURCE MANAGEMENT TECHNIQUE	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students should have: - Understanding various mathematical applications in industries. - Decision making for real time environment.

UNIT I

Operations Research : Introduction – Basics of OR – OR & Decision Making – Role of Computers in OR – Linear Programming Formulations & Graphical Solution of Two Variables – Canonical & Standard Forms of LPP.

UNIT II

Simplex Method : Simplex Method for < , = , > Constraints – Charne's Method of Penalties– Two Phase Simplex Method.

UNIT III

Transportation Problem : Transportation Algorithm – Degeneracy algorithm – Degeneracy in Transportation Problem, Unbalanced Transportation Problem– Assignment Algorithm – Unbalanced Assignment Problem .

UNIT IV

Sequencing Problem : Processing of n Jobs through two Machines – Processing of n Jobs through 3 Machines – Processing of two Jobs through m Machines.

UNIT V

Networks: Network – Fulkerson's Rule – Measure of Activity – PERT Computation – CPM Computation – Resource Scheduling

Text Book:

1. Manmohan & Gupta , **"Operations Research"**, Sultan Chand Publishers, New Delhi

Reference:

1. Prem Kumar Gupta and D.S. Hira, **"Operations Research : An Introduction"**, S. Chand and Co., Ltd. New Delhi,
2. Hamdy A. Taha, **"Operations Research"**, 7th Edition, McMillan Publishing Company, New Delhi, 1982.

Year : First	NON MAJOR ELECTIVE	Semester : II
Hours : 2	17UCTN21 – INTERNET AND WEB PROGRAMMING	Credits : 2

COURSE OUTCOME:

On successful completion of the subject the students well known about the computer industry, all types of computers and its components

UNIT I

Introduction to HTML : History of HTML – Structured of a HTML Program – HEAD and BODY Tags – Title Tag – Paragraph Tag – Heading Tag (H1 to H6) – Formatting Tags :Bold Tag – Italic Tag – Underline Tag – Strike Thru Tag – Subscript Tag – Super Script Tag.

UNIT II

Lists: Ordered List and Unordered List – Heading in a List – Nested Lists – Marquee Tag – Break tag – Horizontal Ruler Tag – Font Tag – Data Definition Tag.

UNIT III

Tables : Table Building Tags and Attributes of Table – TABLE Tag – Table Header Tag – Table Row Tag – Table Data Tag – Row Span – Column Span – Coloring Table Cells – Some Sample Tables.

UNIT IV

Links: Linking Pages Using Anchor tag – Attributes of Anchor Tag – Image Tag and Attributes – Frame Tag and Attributes.

UNIT V

Forms: Form Tag – Input Tag Types – Text Box, Radio Button, Submit Button, Check Box, Password – Internet and Browsers– E– mail – Sample Web page Creation.

Text book:

1. **"World Wide Web design with HTML"** – C Xavier. Tata Mc Graw Hill, 2000.
   Unit I to V – Chapters 1 to 12.

Reference:

1. **"HTML Complete Reference"** – BPB Publications, 2nd edition.
2. **"Web Technology a Developer's Prospective",** N.P.Gopalan, J.Akilandeswari, PHI 2010

Year : First	SKILL BASED PAPER	Semester : II
Hours : 2	17UCTS2P – OFFICE AUTOMATION – LAB	Credits : 2

COURSE OUTCOME:

This lab is how technology works with data through systems set up within a business.

WINDOWS

1. The windows XP and desktop and start menu.
2. Customizing windows XP using the control panel.
3. File management in windows
    - I. Files, folders and Drives
    - II. Searching files and folders.
    - III. Managing user accounts
4. Accessibility and problem solving
    - I. Accessibility wizard
    - II. Help and support centre
    - III. Using a printer
    - IV. Using System tools for basic maintenance

MS–WORD

1. Creating and working with a new document
2. Formatting text
3. Working with Text boxes, shapes, clip art, template, lists line and paragraph spacing
4. Working with Headers and footers.
5. Working with Tables.
6. Applying styles and themes.
7. Using Mail Merge

MS–EXCEL

1. Creating and working and printing work books.
2. Working with basic function
3. Sorting Grouping and filtering cells.
4. Formatting Tables.
5. Working with Charts

POWERPOINT

1. Presentation basics
2. Inserting various effects on slide
3. Using Slide master

Year : Second	CORE PAPER	Semester : III
Hours : 4	17UCTC31 – JAVA PROGRAMMING	Credits : 3

COURSE OUTCOME:

To understand the concepts of object-oriented, event driven programming paradigms and develop skills in using these paradigms using Java.

UNIT I

An Overview Of Programming: Language Translators – Programming Paradigms – Need For Object Oriented Programming – Basics of Object Oriented Programming – Need For Object Oriented Programming – Object Oriented Languages – Evolution of Java – Structure of a Java Program – Input and Output – Java Environment Setup – Getting Familiar With The OOPs Terminologies – Java Philosophy – Data Types and Expression – Primitive Data Types – Reference Data Type – Variables – Constants – Enumerated Constants – Operators and Expressions.

UNIT II

Statements: Labeled Statement – Expression Statement – Null Statement – Compound Statement – Control Statement – Jump – Statement – Try – Throw – Catch – Finally Statements – ***Arrays:*** Declaring Arrays – Creating Arrays – Size of an Array – Array Elements – Accessing Array Elements – Initialization of an Array – Assigning Values to Array Elements – Library Methods for Arrays – Character Array.

Methods And Functions: Declaration, Definition and Call – Main Method Arguments– Reference Variables – Method Overloading – Parameter Passing – Return From Methods.

UNIT III

Class: Class Modifiers – Member Modifiers – Objects – Class Members – Initial Values – Constructor – Overloaded Constructors – Private Constructors – Mutability – Copy Constructor – Finalization – Dynamic Memory Management – Operator New – Garbage Collection – The this Keyword – Interface – Packages.

Class Relationships: Inheritance – Polymorphism – Object Class – Controlling Access to Members of a Class– Direct and Indirect Super Classes– Multiple Inheritance.

UNIT IV

Multi Threading : Processes and Threads – Life Cycle of a Thread – Thread Methods – Creating a Thread – Naming a Thread – Priority Threads – Co–Operative Threads and Preemptive Threads – Sleep – Joining a Thread– Java Standard.

Packages And Classes: Java Standard Packages – Wrappers for Primitive Type.

UNIT V

Input and output: Streams Classes – Class InputStream, OutputStream, FileInputSteam, FileOutputStream – File classes – Class File, RandomAccessFile.

Applet: Structure of an Applet Code – Html Tags for Applet Code – Applet Life Cycle – Other Applet Methods – Color – Fonts – Doing Graphics – Event Handling – Loading and

Drawing Images – Swing – GUI Basic Building Blocks – Swing Class Hierarchy – Events and Listeners – Compounds – Layout – JApplet, JPanel, JFrame.

Text Book:

1. **"Java and Object–Oriented Programming Paradigm"** – Debasish Jana, PHI learning Private Limited, 2010.

Unit I	Chapters 1, 2
Unit II	Chapters 3, 4.1 to 4.7,4.9,4.13,5.1 to 5.5, and 5.8
Unit III	Chapters 6.1 to 6.7, 6.10 to 6.11 ,7.1 to 7.6
Unit IV	Chapters 8.1 to 8.9 ,9.1 to 9.5
Unit V	Chapters 10.1.1 to 10.1.4, 10.2.1,10.2.2 ,11,12

Reference Books:

1. **"Programming with Java a Primer"** – E. Balagurusamy,Tata McGraw Hill, 4th Edition.
2. **"Internet and Java Programming"**, R.Krishnamoorthy,S.Prabhu, New Age International (P)Ltd, 2010.

Year : Second	CORE PAPER	Semester : III
Hours : 4	17UCTC32 – DIGITAL PRINCIPLES AND APPLICATIONS	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students should have Knowledge on Digital circuits, interfacing of various components

UNIT I

Number system and Discrete logic: Binary number – Binary to Decimal – Decimal to Binary – Octal– Hexa Decimal – ASCII Code – Excess 3 Code – Gray Code – Transistor Inverter – OR Gates – AND Gates – Boolean Algebra – NOR Gates – NAND Gates .

UNIT II

Circuit Analysis and Design: Boolean Laws and Theorems – Sums of Product Method – K–map Truth Tables – Pairs, Quads and Octets – K–map Simplifications – Don't Care – Product of Sums Method and its Simplifications.

UNIT III

Arithmetic circuits: Binary Addition – Binary Subtraction – 2's and 1's Complement Representations – Complement Arithmetic – Arithmetic Building Blocks.

UNIT IV

Data processing circuits: Multiplexers – Demultiplexers – 1 to 16 decoder – BCD to Decimal Decoders – 7 Segment Decoders – Encoders – Exclusive OR Gates – Parity Bit Generators and Checkers.

UNIT V

Flip Flops: Registers and Counters: RS Flip Flop – D Flip Flop – JK Flip Flop – Edge Triggered Flip Flops. Shift Register: Types of Register – Counters: Ring Counter and Mod Counters – A Digital Clock.

Text books:

1. Albert Paul Malvino and Donald P. Leach, "**Digital Principles and Appllications"** , TMH 4th Edition 1996.

Unit I	Chapters	5,2.1 ,2.2
Unit II	Chapters	3.1–3.8
Unit III	Chapters	6.1–6.7
Unit IV	Chapters	4.1–4.8
Unit V	Chapters	8.1–8.7, 9.1–9.5, 10.1, 10.4,10.8

Reference:

1. Tocei R.J. Widmer N S **"Digital Principles and Appllications"** , 8th Edition, Pearson Education Pvt.,Ltd. 2004

Year : Second	**CORE PAPER**	**Semester : III**
Hours : 4	**17UCTC3P – JAVA PROGRAMMING – LAB**	**Credits : 3**

COURSE OUTCOME:

To build software development skills using java programming for real world applications.To implement frontend and backend of an application

1. Write a Java Program to Implement Class And Object Concepts.

2. Write a Java Program to Implement Array of Objects.

3. Write a Java Program to manipulate String Class and its Methods.

4. Write a Java Program To Demonstrate the Use of Interfaces.

5. Write a Java Program To Implement the Overloading and Overriding Concepts.

6. Write a Java Program to Implement the Concept of Exception Handling using Pre Defined Exceptions.

7. Write a Java Program to Implement the Concept of Exception Handling using User Defined Exception.

8. Write a Java Program to create package and Importing Classes from User Defined Packages.

9. Write a Java Program to Implement the Concept of Threading.

10. Write a Java Program to Display a Message using Applet.

11. Write a Java Program to Demonstrate Keyboard Event and Mouse Event.

12. Write a Java Programs to Display Basic Shapes and Fill Them, to Set Background and Foreground Colors using Graphics Class.

Year : Second	ALLIED PAPER	Semester : III
Hours : 4	17UCTA31 – COMPUTER ORIENTED NUMERICAL METHODS	Credits : 4

COURSE OUTCOME:

On successful completion of this subject the students should have:- Understanding various concepts of numerical analysis.- Learning various applications statistical methods for Computer Science

UNIT I

Computer Arithmetic: Introduction – Floating Point Representation of Numbers – Arithmetic Operations with Normalized Floating Point Numbers – Consequences of Normalized Floating Point Representation of Numbers –Pitfalls in Computing – Errors in Numbers.

UNIT II

Algebraic And Transcendental Equations: Errors in Numerical Computations – Iteration Method – Bisection Method – Regula – False Position – Newton – Raphson Method. Simultaneous Equations – Back Substitution – Gauss Elimination Method and Gauss Jordon Methods – Iterative Methods: Gauss Jacobi and Gauss Seidel Methods – Calculation of Inverse of a Matrix – Curve Fitting: Method of Least Squares.

UNIT III

Interpolation And Approximation: Newton's Interpolation Formula – Newton's Forward Interpolation and Newton's Backward Interpolation – Central Difference Interpolation Formula – Gauss Forward, Gauss Backward and Sterling's Formula – Lagrange's Interpolation Formula.

UNIT IV

Numerical Differentiation And Integration: Derivatives and Problems using Newton's Forward Difference, Backward Difference and Central Difference Formulas – Numerical Integration – Trapezoidal – Simpson's 1/3 Rule and Simpson's 3/8 Rule– Maxima and Minima of the Interpolating Polynomial.

UNIT V

Numerical Solutions Of Ordinary Differential Equations: Taylor Series Method – Picard's Method – Euler and Modified Euler Methods – First ,Second ,Third and Fourth order Runge – Kutta Methods.

Text Books:

1.**"Computer Oriented Numerical Methods"** by V.Rajaraman 3rd edition

2.**"Numerical Methods"** by S.Arumugam, A.Thangapandi Isaac and A.Somasundaram 2nd edition

1. Unit – I (CONM)	Chapter 2	2.1 to 2.7
2. Unit –II (Numerical Methods)	Chapter 2,3,4	2.4,3.0 to 3.5, 4.0 to 4.5
3. Unit –III (Numerical Methods)	Chapter 7	7.0 to 7.3
4. Unit – I (Numerical Methods)	Chapter 8	8.0 to 8.5
5. Unit– V (Numerical Methods)	Chapter 10	10.0 to 10.4

Reference Books:

1. **"Numerical methods problems and solutions"** ,by M.K.Jain, S.R.K Iyengar and R.K.Jain
2. **"Numerical Methods"** (Revised Edition) by Kandasamy, P.Thilagavathy, K.Gunavathy, S.Chand and Company , New Delhi, 2003
3. **"Introductory Methods of Numerical Anaysis"** by S.S.Saatry, 3rd edition, Printice Hall of India Pvt.Ltd., New Delhi,1999.

Year : Second	**SKILL BASED PAPER**	**Semester : III**
Hours : 2	**17UCTS3P – VISUAL PROGRAMMING LAB**	**Credits : 2**

COURSE OUTCOME:

To in calculate the knowledge on programming and project development using Visual basic.

1. Write a Visual Basic Program to do Simple arithmetic operations (+, –, /, *) text and command controls.
2. Write a Visual Basic Program to manipulate String and Date functions.
3. Write a Visual Basic Program to design an arithmetic Calculator.
4. Write a Visual Basic Program to load a text file into a rich text box using file, directory, drive list boxes,
5. Write a Visual Basic Program to design a text editor using rich text box.
6. Write a Visual Basic Program to implement functions of common dialogue boxes (open, save, color).
7. Write a Visual Basic Program to design a screen saver and to animate a picture.
8. Write a Visual Basic Program to change the font, font size of the given text using list box, combo box
9. Write a Visual Basic Program to display a popup menu in the form when you click the right mouse button.
10. Write a Visual Basic Program to implement database accessing functionalities using DAO, ADO, ODBC.

Year : Second **CORE PAPER** **Semester : IV**

Hours : 4 **17UCTC41 – RELATIONAL DATABASE** **Credits : 4**

COURSE OUTCOME:

To inculcate knowledge on RDBMS concepts and Programming with Oracle

UNIT I

Data And Information Process: Introduction – Definition of Information – Quality of Information Processing – Integrated Management Information – Information as the Competitive Weapon. ***Secondary storage devices:*** Advantages – Magnetic Disks – Optical Disks – Magneto – Optical Drives – File Organization and File Structure – Operations on File – Storage Media – File Structure.

UNIT II

Introduction to DBMS: Introduction – Characteristics of Data in Database – Types of DBMS – Database Development Life Cycle (DDLC). ***Introduction to RDBMS:***RDBMS Terminology – The Relational Data Structure – Relational Data Integrity – Relational Data Manipulation – CODD's Rules.

UNIT III

E–R Modelling And Normalization: Introduction – Components of E–R Model E–R Modelling Symbols. ***EER Model*****:** Super Class and Sub Class Entity Types – Attribute Inheritance – Specialization – Generalization – Categorization. ***Data Normalization:*** 1NF, 2NF, 3NF–BCNF – 4NF AND 5NF – Denormalization.

UNIT IV

Relational algebra and Relational calculus: Relational Algebraic Operations – Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus. Introduction to Structured Query Language – Characteristics & Advantages of SQL–SQL Data Types and Literals – Types of SQL Commands.

SQL operators: Arithmetic Operator – Comparison Operator – Logical and Set Operators – Operator Precedence.

UNIT V

Tables, Queries and subQueries and Aggregate function: Tables – Nulls in Action – Queries – Subqueries – Aggregate Function – Insert, Update, Delete Operations – Cursor Operations – Cursor Positions.

Text Book:

1."**Database Management Systems**" by Alexis Leon,Mathews Leon.

Unit–I	Chapters 1 to 3.
Unit–II	Chapters 5 to 7.
Unit–III	Chapters 9 to 11.
Unit–IV	Chapters 12 & 14.
Unit–V	Chapters 15 to 20.

Reference:

1. **"Database System using oracle",** Nilesh shah, 2dn edition, PHI.
2. **"Database System concepts"**, Abraham, Silberschatz, Henry.f.Korth and S.Sudarshan, 5th edition—TMH.

Year : Second **CORE PAPER** **Semester : IV**

Hours : 4 **17UCTC42 – DATA STRUCTURS AND ALGORITHMS** **Credits : 4**

COURSE OUTCOME:

Desire for continuous and independent learning analyzing & using data.Appreciation for the dynamic role of solving problems & algorithms

UNIT I

Introduction to Data Structures: Introduction – Algorithm Analysis – Problem Solving – Modular Design – Implementation Of Algorithms – Testing – Verification.

Arrays: Introduction – Range Of Array – Primitive Operations – Addressing Function – One Dimensional Array – Two Dimensional Array – Storage Representation of 2D Arrays – Multi Dimensional Array – Special Types of Mat Races – Sparse Matrices

UNIT II

Linked lists: Introduction – Memory Allocation – Benefits – Limitations – Types: Basic Operation – Singly Linked Lists – Simple Algorithms on Linked Lists – Circular Linked Lists – Doubly Linked Lists – Circular Doubly Linked Lists – Multiply Linked Lists – Polynomial Representation – Polynomial Addition.

UNIT III

Stack: Introduction – ADT Stack – Implementation of Stack – Applications – Tower of Hanoi. ***Queues:*** Implementation of Queues – Basic Operations on Array, Linked Lists Based – Circular Queues – Desuetude.

UNIT IV

Trees: Binary trees – Representation of Binary Trees – Tree Traversals

UNIT V

Sorting and Graph: Types of Sorting. Representation on Graph – Operations on Graphs – BFS – DFS.

Text books:

1. **"Data Structuresb"** – A.Chitra, P.T. Rajan. Vijay Nicole Imprints Pvt.,Chennai.Reference:
   Unit I : Chapter 1,2,3 Unit II : Chapter 4 Unit III : Chapter 5,6
   Unit IV : Chapter 7 Unit V : Chapter 11,12

References:

1. Ellis Horowitz, Sartaj Shani, **"Data and File Structures"** Galgotia Publication.
2. Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran, **"Computer Algorithms"** Galgotia Publication.

Year : Second	CORE PAPER	Semester : IV
Hours : 4	17UCTC4P – RELATIONAL DATABASE MANAGEMENT SYSTEMS – LAB	Credits : 3

COURSE OUTCOME:

DBMS lab aims at practicing and achieving this aim by using various software's such as SQL, ORACLE, and MS – Access etc. All these require a thorough practice of various DDl, DCL and DML queries.

1) Create a table by using DDL commands like create, drop, and add constraints to that table.

2) Create a table and use DMLstatementslike Insert, Update, Select, deleteand truncate on that table.

3) a. Create a table and use Transaction Control statements like Commit, savepoint, roll back on that table.
b.Create a table and use Data Control statements like grants and revokes on that table.

4) Create a table and use Data ProjectionStatements like multi column, aliasname, arithmeticoperation, distinctrecord, concatenation, where clause on that table.

4) Create a table and useData Selection Statements like between, and, in, notin, like, relational& logical operators on that table.

5) Create a table and useAggregate Functions like count, maximum, minimum, sum, average, orderby, Groupby, having on that table.

6) Create a table and use Join Queries like inner joins, outer joins,equi–join,non–equijoin,
self–join and Cartesian join on that table.

7) Create a table and use Sub–Queries like in, not in some, any, all, exsits, not exists on that table.

8) Create a table and use Set Operations like union, union all, intersect, minus on that table.

9) Create a table and use Database Objects like Synonym, Sequences, view, index on that table.

11) Create a table and use Cursors on that table.

12) Create a table with the concepts Function and Procedures.

13) Create a table with the concept Triggers.

14) Create a table with the concept of Exception.

15) Create a table with the concept Packages.

Year : Second	ALLIED PAPER	Semester : IV
Hours : 4	17UCTA41 – STATISTICS AND APTITUDE	Credits : 4

COURSE OUTCOME:

The paper deal with improve the numerical and logical ability of the student

UNIT I

Expectation – Variance – Covariance – Moment Generating Functions – Theorems on Moment Generating Functions – Moments – Various Measures.

UNIT II

Correlation & Regression –Properties of Correlation & Regression Coefficients – Numerical Problems for finding the Correlation & Regression Coefficients.

UNIT III

Numbers – HCF – LCM – Problems on Numbers. Decimal Fractions and Simplification

UNIT IV

Ratio and Proportion – Partnership – Allegation or Mixture

UNIT V

Average – Problems on Age

Text Books:

1. Gupta.S.C & Kapoor,V.K , **"Fundamentals of Mathematical Statistics"** , Sultan Chand & sons, New Delhi –1994 Edition
2. **"Quantitative Aptitude"** by R.S.Aggarwal, S.Chand & Company Ltd., Ram Nagar, New Delhi (2007)

References:

1. Thambidurai .P, **"Practical Statistics"**, Rainbow publishers – CBE (1991)

Year : Second	**SKILL BASED PAPER**	**Semester : IV**
Hours : 2	**17UCTS4P – MOBILE APPLICATION DEVELOPMENT – LAB**	**Credits : 2**

COURSE OUTCOME:

To understand how to work with various mobile application development framework

1. To create a Java Android Program to Build a Simple Android Application.
2. To create a Java Android Program to Change the Background of Your Activity.
3. To create a Java Android Program to Change the Image Displayed on the Screen.
4. To create a Java Android Program to Create Multiple Activities within an Application.
5. To create a Java Android Program to Demonstrate the Sound Button Application.
6. To create a Java Android Program to Demonstrate Radio Group Application.
7. To create a Java Android Program to Demonstrate Alert Dialog Box.
8. To create a Java Android Program to Demonstrate the Menu Application.
9. To create a Java Android Program to Demonstrate Text to Speech in Android.

10 To create a Java Android Program to Demonstrate Activity Life Cycle.

Year : Third	CORE PAPER	Semester : V
Hours : 6	17UCTC51 – DOT NET TECHNOLOGIES	Credits : 4

COURSE OUTCOME:

The objective of the course is to introduced dot net technologies which provides multi language environment to develope windows based software development.

UNIT I

Introduction to **.**NET – **.**NET Defined – The **.**NET Framework – Visual Basic **.**NET. VB6 and VB **.**NET Differences – Data Type Changes – Arrays – Operators – User Defined Types – Null Values, Variables – Procedures – Properties – Control Flow – Form–based Application Changes – Application Types – Data Access – Object Oriented Programming and VB**.**NET – Encapsulation – Inheritance, Polymorphism – Data Types, Variables, and Operators – Arrays – Conditional Logic.

UNIT II

Procedures – Dialog Boxes – Introduction to Dialog Boxes – File IO and System Objects – Directory object – Error Handling – Namespaces – Classes and Objects – Multithreading.

UNIT III

Data Access – Introduction to Data Access in **.**NET – ADO.NET – Data Access in Visual Studio **.**NET – Visual Studio **.**NET Database Tools, Visual Studio **.**NET and ADO**.**NET – Visual Studio **.**NET and XML – Manipulating XML in Code – Windows Forms – Introduction to System Windows Form – Controls – Specific Controls – Base Controls, Derived Controls, Display Controls, Dialog Controls, Miscellaneous Controls.

UNIT IV

Visual Inheritance – Irregular Forms – Other Namespaces and Objects in the Catalog – Introduction to Web Development – Introduction to ASP.NET – Page Framework – HTML Server Controls.

UNIT V

Web Controls – Validation Controls – User Controls – Events – Cascading Style Sheets – State Management – ASP**.**NET Applications – Creating Web Application, Deleting an Application, global.asax, Understanding web.config.

Text Book:

1. Bill Evjen, Jason Beres, et al, **"Visual Basic .NET Programming"** ,Wiley India Publication,2002 – Chapters 1–15,21–41.

Reference Books:

1. David Chappell, **"Understanding .NET"** , Pearson education, 2002

2. David.S.Platt, **"Introducing Microsoft .Net**" , PHI, 2003.

3. G.AndrwDuthie **, "Microsoft ASP .NET Programming with Microsoft Visual**

C# .NET Step by Step" , PHI ,2003.

3. George Shepherd, **"Microsoft ASP .NET 3.5"** , PHI, New Delhi, 2008.

Year : Third	CORE PAPER	Semester : V
Hours : 6	17UCTC52 – OPERATING SYSTEMS AND SYSTEM SOFTWARE	Credits : 4

COURSE OUTCOME:

To provide fundamental concepts of all managements in an operating system.

UNIT I

System Software: Definition – Components of System Software – Fundamentals of Language Processing – Language Specification – Language Processor Development tools – Scanning – Parsing – Assemblers : Elements of Assembly Language Programming – A Simple Assembly Scheme – Pass Structure of Assembler – A design of Two Pass Assembler – Macros & Macro Processors.

UNIT II

Compilers: Aspects of Compilation – Memory Allocation – Compilation of Expressions – Compilation of Control Structures – Code Optimization – Interpreters.

Linkers : Relocation & Linking Concepts – Design of Linker – Self Relocating Programs–A Linker for MS–DOS – Linking for Overlays – Loaders.

UNIT III

Operating System: Evolution of OS Functions – OS Functions – Batch Processing Systems – Multiprogramming Systems – Time Sharing Systems.

Processes: Definition – Control – Interacting Processes –Threads.

UNIT IV

Deadloacks: Definitions – Resource Status Modeling – Handling – detection & Resolution – Avoidance

Memory Management: Memory Allocation Preliminaries – Contiguous Memory Allocation – Paging – Segmentation .

UNIT V

IO Organization – IO Devices – File Systems : Directory Structures – File Protection – Disk Space – File Access – File Sharing – Unix File System.

Text Book:

1.D.M.Dhamdhere, **"System Programming & Operating Systems"** ,2nd edition, TMH

Reference Books:

1. Achyut s Godbole , **" Operating Systems"** , TMH Publications , 2002

2. John J. Donovan , **"Systems Programming"** , TMH Publications , 1991

Year : Third	CORE PAPER	Semester : V
Hours : 5	17UCTC5P – DOT NET PROGRAMMING – LAB	Credits : 4

COURSE OUTCOME:

The objective of the course is to introduced dot net technologies which provides multi language environment to develope windows based software development.

ASP.NET:

- Webforms in ASP.NET
- Validation
- ADO.NET
- ASP.NET Data controls
- Working with XML data
- Web Services

VB.NET

- Validation
- Arrays and Structure
- Procedures
- Decision Structures
- Exception Handling
- open a connection to a database using ADO.NET

Year : Third **CORE PAPER** **Semester : V**

Hours : 5 **17UCTC5Q – UNIX AND SHELL PROGRAMMING - LAB** **Credits : 4**

COURSE OUTCOME:

To provide fundamental concepts of all managements in an operating system

1. Write a Shell script to display “Hello world” in bold, blink effect and in green colour.

2. Write a Shell script by using commands bourn shell, bash shell.

3. Write a Shell script to count number of user’s login and print first login user information

4. Write a Shell script to all files whose size is greater than specific size.

5. Write a Shell Script to read user name and find whether the user is currently working in the system or not.

6. Write a Shell script by using filters grep, awk, tr, sed, etc.

7. Write a Shell script to perform arithmetic operations using case.

8. Write a Shell script by using commands cat,cp.

9. Write a Shell script to implement the commands grep, sed.

10. Write a Shell script to display the numbers in following pattern:

```
1
22
333
4444
55555
```

11. Write a Shell script to print the numbers 5, 4, 3, 2, 1 using while loop.

12. Write a Shell script to copy and rename a file.

13. Write a Shell script to find the factorial of a number.

14. Write a Shell script to find the sum of the digits and reverse of a given number.

15. Write a Shell script to display a multiplication table.

16. Write a Shell script to display student mark details

17. Write a Shell script to prepare an electricity bill.

18. Write a Shell script to display the given numbers in ascending order.

Year : Third	ELECTIVE CORE PAPER	Semester : V
Hours : 4	17UCTE51 – COMPUTER GRAPHICS	Credits : 4

COURSE OUTCOME:

Have a thorough overview of computer graphics.

UNIT I

Introduction: Applications of Computer Graphics, Operations of Computer Graphics, Graphics Software Packages, requirements of a Graphical System, Graphical User Interfaces. ***Graphical Input–Output Devices:*** Graphical Input Devices – Common Input Devices, Other Input Devices. Graphical Output Devices, Raster Scan Video Principles – Raster Scan CRT Monitors, Colour Raster Scan Systems, Plasma Panel Display, LCD Panels, Hard Copy Raster Devices. Random Scan Devices – Memory Tube Displays, Plotters. Graphic Accelerators and Graphic Co–Processor.

UNIT II

Scan Conversion: Scan Conversion – Scan Conversion Methods. DDA Algorithms – DDA for a Line, DDA for Circle Generations, DDA for Ellipse. Bresenham's Algorithms – Bresenham's Line Algorithm, Bresenham's Circle Algorithm. Midpoint Methods – Midpoint Line Algorithm, Midpoint Circle Algorithm, Midpoint Ellipse Algorithm.

Scan Conversion Of Solids: Solid Areas or Polygons, Inside – Outside Test – Odd – Even Method, Winding Number Method. Solid Area Filling Algorithm – Boundary Fill Algorithm, Flood Fill Algorithm, Scan Line Fill Algorithm, Scan Line Seed Fill Algorithm, Ordered Edge List Algorithm.

UNIT III

2D Geometrical Transformations: Some Basic Transformations – Translation, Scaling , Rotation, Transformation of Points and Objects. Homogeneous Coordinate System– Transformations in Homogeneous Notations, Inverse of Basic transformations , Scaling about a Reference Point, Rotation about an Arbitrary Point. Other Transformations – Reflection , Reflection about any Arbitrary Line, Shearing.

UNIT IV

3D Geometrical Transformations: Basic 3D Transformations – 3D Translation, 3D Scaling, 3D Rotation, Rotation about an Arbitrary Point. Other 3D Transformations – 3D Reflection, Reflection about any Arbitrary Plane, 3D Shearing.

2D Viewing and Clipping: Windows and Viewports, Viewing Transformations – Viewing Transformation Matrix. Clipping of Lines in 2D Cohen – Sutherland Clipping Algorithm, Midpoint Subdivision Method.

UNIT V

Concepts Of Colours: Colour Models for Images, Classification of Colour Models, Additive vs Subtractive Colour Models. CIE Colour Standard – XYZ Colour Model, RGB Colour Model, CMY Colour Model, YIQ Colour Model , HSV Colour Model, HIS Colour Model, YCb C r Colour Model, YUV Colour Model, CIE Colour Models.

Text Book:

1. **"Computer Graphics Multimedia And Animation"** ,Malay K. Pakhira, PHI 2nd edition.

Unit – I	Chapter – 1.1 – 1.5, 2.1 – 2.5
Unit – II	Chapter – 3.1, 3.3–3.5, 4.1 – 4.3
Unit – III	Chapter – 5.1–5.3 &7.1 – 7.3
Unit – IV	Chapter – 9 .1, 9.3.1, 9.3.3& 12.1,12.2
Unit – V	Chapter – 13.5, 13.6 & 15.1 – 15.3

References:

1. Donald Hearn, Pauline Baker, **"Computer Graphics – C Version"**, 2nd edition, Pearson Education,2004.
2. F.S. Hill, **"Computer Graphics using OPENGL"**, 2nd edition, Pearson Education,2003.

Year : Third	ELECTIVE CORE PAPER	Semester : V
Hours : 4	17UCTE52 – INFORMATION SECURITY	Credits : 4

COURSE OUTCOME:

To protect the information and systems that support the operations and assets.

UNIT I

Introduction: History – What is Information Security? – Critical Characteristics of Information – NSTISSC Security Model – Components of an Information System – Securing the Components – Balancing Security and Access – The SDLC – The Security SDLC.

UNIT II

Security Investigation: Need for Security– Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III

Security Analysis: Risk Management – Identifying and Assessing Risk – Assessing and Controlling Risk

UNIT IV

Logical Design: Blueprint for Security – Information Security Policy – Standards and Practices – ISO 17799/BS 7799, NIST Models – VISA International Security Model – Design of Security Architecture – Planning for Continuity

UNIT V

Physical Design: Security Technology – IDS – Scanning and Analysis Tools – Cryptography – Access Control Devices – Physical Security – Security and Personnel.

Text Book:

1. Michael E Whitman and Herbert J Mattord, **"Principles of Information Security"**, Vikas Publishing House, New Delhi, 2003

References Books:

1. Micki Krause, Harold F. Tipton, **" Handbook of Information Security Management"**, Vol 1–3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, **"Hacking Exposed",** Tata McGraw–Hill, 2003
3. Matt Bishop, **" Computer Security Art and Science",** Pearson/PHI, 2002.

Year : Third	ELECTIVE CORE PAPER	Semester : V
Hours : 4	17UCTE53 – EMBEDDED SYSTEMS	Credits : 4

COURSE OUTCOME:

To provide knowledge of the various phases of embedded system

UNIT I

Introduction to Embedded Systems – Processor and Memory Organization.

UNIT II

Devices and Buses for Devices Network – Devices Network – Devices Drivers and Interrupt Servicing Mechanism.

UNIT III

Programming Concepts and Embedded Programming IN C and C++ – Program Modeling Concepts in Single and Multiprocessor System Software.

UNIT IV

Development Process – Software Engineering Practices in Embedded Software Development Process – Inter Process Communication and Synchronization of Process.

UNIT V

Tasks and Threads – Real Time Operating Systems.

Text Book:

1. **"Embedded Systems: Architecture and Programming"**, Raj Kamal ,TMH 2005.

Reference book:

1. **"Microcontrollers Theory and Applications"**,Ajay V Deshmukh, TMH 2006

Year : Third	**SKILL BASED PAPER**	**Semester : V**
Hours : 2	**17UCTS51 – PYTHON – LAB**	**Credits : 2**

COURSE OUTCOME:

The purpose of this lab is to become familiar with pythons built in text container and list containing multiple strings.

1. Write a python program to find reverse of an integer number use looping structure
2. Write a python program to LCM and GCD of two numbers.
3. Write a python program to create user defined functions with Required arguments, keyword arguments, Default arguments, Variable–length arguments
4. Write a python program to implement the concept lists.
5. Write a python program to illustrate the use of calendar module and time module.
6. Write a program to implement the concept of internet module
7. Write a python program to send an e–mail
8. Write a python program to implement the concept of multi threading
9. Write a python program to implement Tinder module
10. Write a python program to illustrate the concept of exception handling

Year : Third	EVS PAPER	Semester : V
Hours : 2	17UEVS51 – ENVIRONMENTAL STUDIES	Credits : 2

COURSE OUTCOME:

On successful completion of this subject students would have knowledge on the formation of earth and ways to manage the disasters, pollutions.

UNIT I

a) Earth – Formation and Evolution of Earth over time – Structure of Earth and its Components – Atmosphere, Lithosphere, Hydrosphere and Biosphere
b) Resources – Renewable and Non Renewable Resources

UNIT II

a) Ecology – Definition – Ecosystem: Definition – Structure and Function – Energy Flow – Food Chain and Food Web – One example for an Ecosystem
b) Biogeochemical cycles – Nitrogen, carbon, Phosphorous and Water

UNIT III

a) Introduction – definition – Values of Biodiversity – Threat to Biodiversity – Conservation of Biodiversity
b) Biodiversity of India – as a mega diversity nation – bio–geo graphical distribution – Hot spots of biodiversity – National Biodiversity conservation Board and its function

UNIT IV

a) Definition, causes, effects and control measures of Air, Water, Soil, Marine, Noise, Thermal and Nuclear pollution
b) Global issues: Global Warming and Ozone layer Depletion

UNIT V

a) Sustainable Development – Sustainable Agriculture – Organic farming, Irrigation – Water harvesting and Waste recycling – Cyber waste and management
b) Disaster Management – Flood and Drought – Earthquake and Tsunami – Landslides and Avalanches – Cyclones and Hurricanes – Precautions, Warnings, Rescue and Rehabilitation.

Text Book:

1. **"Environmental Studies"** – Published by Madurai Kamaraj University

Reference:

1. **'Environmental Studies"** by Dr.N. Arumugam & Prof.V.Kumarasan, Saras Publication – 2009.
2. **"Environmental Studies"** by Bharathiar University, Combatore – 2004.

Year : Third	CORE PAPER	Semester : VI
Hours : 5	17UCTC61 – SOFTWARE ENGINEERING	Credits : 4

COURSE OUTCOME:

To provide knowledge of the various phases of software engineering process.

UNIT I

Introduction to Software Engineering: Definitions, Size factors– Quality and Productivity Factors – Managerial Issues – Planning a Software Project: Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure.

UNIT II

Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing Level Estimation – Estimating Software Maintenance Costs – Software ***Requirements Definition:*** The Software Requirements Specification – Formal Specification Techniques – State Oriented Notations.

UNIT III

Software Design: Fundamental design concepts – Modules and Modularization criteria – Design Notations – Design Techniques.

UNIT IV

Implementation Issues: Structured coding techniques – Coding Style – Modern programming language Features: Type checking – User–defined data types – Data abstraction – Scoping Rules.

UNIT V

Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing – Formal Verification.

SoftwareMaintenance: Enhancing Maintainability during development – Managerial Aspects of Software maintenance.

Text Book:

1. Richard E.Fairley, **"Software Engineering Concepts",** Tata McGraw Hill, 30th Reprint, 2008.
   Unit 1 Chapter: 1, 1.1 to 1.4, 2.1 to 2.4.
   Unit 2 Chapter: 3.1 to 3.4, 4.1 to 4.2.
   Unit 3 Chapter: 5.1 to 5.4.
   Unit 4 Chapter: 6.1 to 6.2, 7.1 & 7.3 to 7.5.
   Unit 5 Chapter: 8.1 to 8.2, 8.5 to 8.7, 9.1 to 9.2.

Reference:

1. Roger S. Pressman, "**Software Engineering**: **A Practitioner's Approach"**, TMH, 4th edition.

Year : Third	CORE PAPER	Semester : VI
Hours : 5	17UCTC62 – COMPUTER NETWORKS	Credits : 4

COURSE OUTCOME:

Objective of the computer network is Resource Sharing, high Reliability, increase System Performance and Security

UNIT I

Introduction: Business Applications -Social Issues -Network Hardware -Network Software - Protocol Hierarchies -Connection-Oriented Versus Connectionless Service -The OSI Reference Models -The TCP/IP Reference Models -Comparison of the OSI and TCP/IP Reference Models.

UNIT II

The Physical Layer: Guided Transmission Media -Wireless Transmission -The Mobile Telephone System.

UNIT III

The Data Link Layer: Data Link Layer Design Issues -Error Detection and Correction - Sliding Window Protocols -Multiple Access Protocols -ALOHA, CSMA, Collision free Protocols.

UNIT IV

The Network Layer: Network Layer Design Issues -Routing Algorithms -Shortest path, Flooding, Hierarchical and Broadcast.

The Transport Layer: The Transport Service -Services Provided to the Upper Layers - Transport Service Primitives - Elements of Transport Protocols.

UNIT V

The Application Layer: DNS -The Domain Name System -Electronic Mail -The World Wide Web -Architectural Overview -HTTP-The Hypertext Transfer Protocol

Text Book:

1. Andrew S.Tanenbaum and David J.Wetherall, **"Computer Networks",** 5th Edition, Pearson Educatuion.

   Unit I -Chapter 1.1.1, 1.1.4, 1.2, 1.3.1, 1.3.3, 1.4.1, 1.4.2, 1.4.4

   Unit II -Chapter 2.2, 2.3, 2.7

   Unit III -Chapter 3.1, 3.2, 3.4, 4.2.1, 4.2.2, 4.2.3

Unit IV -Chapter 5.1, 5.2.2, 5.2.3, 5.2.6, 5.2.7, 6.1.1, 6.1.2, 6.2

Unit V -Chapter 7.1, 7.2.1, 7.2.3, 7.2.4, 7.2.5, 7.3.1, 7.3.4

Reference:

1.William Stallings, "**Data and Computer Communications",**Prentice Hall of India,New
Delhi, 2002.

2.**"Data Communications and Networking"** -Behrouzan A.Forouzan, TMH, 2005

Year : Third	CORE PAPER	Semester : VI
Hours : 4	17UCTC63 – DATA MINING	Credits : 4

COURSE OUTCOME:

To Study Algorithms And Computational Paradigms That Allow Computers To Find Patterns And Regularities In Databases.

UNIT I

Introduction – Data Mining as a Subject – What Is Data Warehouse – Definition – Multi Dimensional Data Model – OLAP Operations – Warehouse Schema – Data Warehousing Architecture – Warehouse Server – Metadata – OLAP Engine –Data Warehouse Backend Process.

UNIT II

What Is Data Mining – Definitions – KDD Vs. Data Mining, DBMS Vs DM – Other Related Areas – DM Techniques – DM Application Areas – What is an Association Rule – Methods to Discover Association Rules – A Priori Algorithm – Partition Algorithm – Pincer Search Algorithm – Dynamic Itemset Counting Algorithm – Rapid Association Rule Mining – Eclat and Declat.

UNIT III

Clustering Paradigms – Paradigms – Partitioning Algorithms – K–Medoid Algorithms – CLARA – CLARANS – Hierarchical Clustering – CUBE – Categorical Clustering Algorithms – STIRR – ROCK.

UNIT IV

Web Mining – Web Content Mining – Web Structure Mining – Web Usage Mining – Text Mining – Unstructured Text – Episode Rule Discovery for Texts.

UNIT V

What is Temporal Data Mining – Temporal Association Rules – Sequence Mining – The Gsp Algorithm – Spatial Mining – Spatial Mining Tasks – Spatial Clustering.

Text Book:

1. **"Data Mining Techniques"** – Arun K. Pujari, University Press, 2001.

Unit I	Chapter 1.1, 1.2, 2.1to 2.11
Unit II	Chapter 3.1 to 3.7, 3.10, 4.1 to 4.7, 4.9, 4.10
Unit III	Chapter 5.1 to 5.7, 5.10, 5.11 to 5.13
Unit IV	Chapter 9.1 to 9.8
Unit V	Chapter 10.1 to 10.5, 10.12 to 10.14

Reference Book:

1. J. Han and M. Kamber. **" Data Mining: Concepts and Techniques"**, 2nd Ed. Morgan Kaufman. 2006.
2. M.H. Dunham. **"Data Mining: Introductory and Advanced Topics"**, Person Education. 2001.

Year : Third	CORE PAPER	Semester : VI
Hours : 5	17UCTC6P – WEB TECHNOLOGY LAB	Credits : 4

COURSE OUTCOME:

This course is intended to teach the basics involved in publishing content on the world wide web.

1. Create a Web Page with the Following Using Html

    i) To Embed An Image Map In A Web Page

    ii) To Fix The Hot Spots

    iii) Show All The Related Information When The Hot Spots Are Clicked.

2. Creation of Html Pages with Frames, Links, Tables and Other Tags.

3. Usages of Internal and External CSS Along With Html Pages.

4. Client Side Scripts for Validating Web Form Controls Using DHTML.

5. Form Validation Including Text Field, Radio Buttons, Check Box, List Box And Other Controls.

6. Servlet Program Using Http Servlet.

7. Inter Act Form Using Get And Post Method.

8. JSP Program To Perform Arithmetic Function.

9. Any Online Application Using Data Base.

10. Creation of Color Palette.

11. Program Using Xml Schema – XSLT/XSL.

12. Program Using Ajax and XML.

13. Sample Web Application Development in the Open Source Environment.

14. Airline Reservation System Using Web Services and Database.

15. Write Programs In Java To Create Three–Tier Applications Using JSP And Databases for Conducting On–Line Examination.

Year : Third	ELECTIVE CORE PAPER	Semester : VI
Hours : 4	17UCTE61 – WEB TECHNOLOGY	Credits : 4

COURSE OUTCOME:

This course is intended to teach the basics involved in publishing content on the world wide web.

Unit I

Fundamental: A Brief Introduction to the Internet – Internet Services and Accessibility – Uses of Internet – Protocols – Web Concepts – Internet Standards – Internet Protocols – Hostnames – Internet Applications and Application Protocols.

Unit II

Introduction to HTML: SGML– Outline of HTML Document – Head Section – Body Section – HTML Forms. ***Java Script:*** Introduction – Language Elements – Objects of Java Scripts – Other Objects – Arrays

Unit III

VB Script: Introduction – Comments – Variables, Arrays Variables – Operators –Procedures – Conditional Statements –Looping Constructs – Objects and VBScript – Cookies.

DHTML:Introduction – Cascading Style Sheets (CSS) – DHTML Document Object Model and Collections – Event Handling – Filters and Transition – Data Binding.

Unit IV

XML: Introduction – HTML vs XML – Syntax – XML Attributes – XML Validation – XML DTD – Building Blocks of XML Documents – DTD Elements – DTD Attributes – DTD Entities – DTD Validation – XSL –XSL Transformation – XML Namespaces – XML Schema.

Unit V

JSP: Advantages of JSP – Developing a JSP Program – Components of JSP – Reading Request Information – Retrieving a data Posted from HTML file to a JSP file – JSP sessions – Cookies – Disabling Sessions. **ASP**: Introduction – Advantages – Processing ASP Script with Forms – Variable and Constructs – Subroutines – Include/Virtual – ASP Cookies – ASP Objects – Connecting to Data with ASP.

Text Book:

1. **"Web Technology A Developer's Perspective"** ,2nd Edition,N.P.Gopalan, J.Akilandeswari, PHI 2010.

Unit I	Chapter 1, 2
Unit II	Chapter 4, 5
Unit III	Chapter 6, 7
Unit IV	Chapter 8
Unit V	Chapter 11, 12

References:

1. **"Web Design – A Beginner's Guide"** , Wendy Willard, Tata McGraw Hill.
2. **"World Wide Web Designing"** , C.Xavier, Tata McGraw Hill, 2000.

Year : Third	ELECTIVE CORE PAPER	Semester :VI
Hours : 4	17UCTE62 – ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	Credits : 4

COURSE OUTCOME:

To have enriched knowledge regarding heuristic search, Knowledge representation and Expert systems.

UNIT I

Introduction: AI Problems – AI techniques – Criteria for Success. Problems, Problem Space, Search: State Space Search – Production Systems – Problem Characteristics – Issues in Design of Search.

UNIT II

Heuristic Search Techniques: Generate and Test – Hill Climbing – Best–First, Problem Reduction, Constraint Satisfaction, Means–end Analysis.

UNIT III

Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representations – Issues in Knowledge Representations – Frame Problem.

UNIT IV

Using Predicate Logic: Representing Simple Facts in Logic – Representing Instance and is a Relationships – Computable Functions and Predicates – Resolution – Natural Deduction.

UNIT V

Representing Knowledge Using Rules: Procedural Vs Declarative Knowledge – Logic Programming – Forward Vs Backward Reasoning – Matching – Control Knowledge.

Expert Systems: Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge Acquisition.

Text Book:

1. Elaine rich and Kelvin Knight, **"Artificial Intelligence"**, Tata McGraw–Hill publication, 2nd Edition, 1991.

Unit I	Chapters 1,2
Unit II	Chapter 3
Unit III	Chapter 4
Unit IV	Chapter 5
Unit V	Chapter 6,20

2. Andrew S. Tanenbaum and David J. Wetherall, " **Computer Networks"**, 5th Edition, Pearson Education.

Unit I	Chapter 1.1.1, 1.1.4, 1.2, 1.3.1, 1.3.3, 1.4.1, 1.4.2, 1.4.4
Unit II	Chapter 2.2, 2.3, 2.7
Unit III	Chapter 3.1, 3.2, 3.4, 4.2.1, 4.2.2, 4.2.3
Unit IV	Chapter 5.1, 5.2.2, 5.2.3, 5.2.6, 5.2.7, 6.1.1, 6.1.2, 6.2
Unit V	Chapter 7.1, 7.2.1, 7.2.3, 7.2.4, 7.2.5, 7.3.1, 7.3.4

Reference Book:

1. **"Artificial Intelligence a modern Approach"** – Stuart Russell & Peter Norvig, 2nd Edition Perason Education.
2. William Stallings, **"Data and Computer communications"**, Prentice Hall of India, New Delhi – 2002.
3. **"Data Communications and Networking"** – Behrouzan A. Forouzan, TMH, 2002.

Year : Third	ELECTIVE CORE PAPER	Semester : VI
Hours : 4	17UCTE63 – GRID COMPUTING	Credits : 4

COURSE OUTCOME:

To get an overview about system infrastructure of grid and to learn about the current architecture, services and instantiations of the Grid.

UNIT I

Introduction: Early Grid Activities – Current Grid Activities – An Overview of Grid Business areas – Grid Applications – Grid Infrastructure.

UNIT II

The Anatomy of the Grid: The Concept of Virtual Organizations – Grid Architecture – Grid Architecture and Relationship to other Distributed Technologies – The Grid Computing Road Map – Autonomic Computing – Business on Demand and Infrastructure Virtualization– Service Oriented Architecture and Grid–Semantic Grids.

UNIT III

The Open Grid Services Architecture: Introduction – OGSA Architecture and Goal – OGSA Platform Components – Native Platform Services and Transport Mechanisms – OGSA Hosting Environment – Core Networking Services Transport and Security – OGSA Infrastructure – OGSA Basic services.

UNIT IV

The Open Grid Services Infrastructure: Grid Services – Technical Details of OSGI Specification, Service Data Concepts – How to Declare Service Data with Port Type – Service Data Structure – How Mutability Attributes Affect Service Data – Types of Service Data Elements and Service Data Values – Qualifying Service Data Element with Lifetime Attributes.

UNIT V

Grid Service: Naming and Change Management Recommendations – Grid Service Instance Handles, References and Usage Models – Recommended GSR Encoding WSDL – Life Cycle of a Grid Service Instance – Service Life Cycle Management Using a Soft – State Approach – Grid Service Interfaces – Grid Service – Provided Service Data Query Capabilities – Grid Service – Provided Service Data Update Capabilities.

Text Book:

1.Joshy Joseph, Craig Fellenstein, **"Grid Computing"**, Pearson Education, New Delhi 2004.

Unit I,II,III,IV,V : Chapter 1, 3, 4, 6,8,9

References:

1. Ian Foster, Carl Kesselman, **"The grid2 Blueprint for a new computing infrastructure"**, Morgan Kaufman, New Delhi 2004

Year : Third	**VALUE EDUCATION PAPER**	**Semester : VI**
Hours : 2	**17UVED61 – VALUE EDUCATION**	**Credits : 2**

COURSE OUTCOME:

on successful completion of this subject students must learnt about society, professional values, and ideas behind all religions and the respect for others.

UNIT I

Values and the Individual: Values – Meaning – The Significance of Values – Classification of Values – Need for Value Education.

Values and the Individual: Self Discipline, Self Confidence, Self initiative Empathy, Compassion, Forgiveness, Honesty and Courage.

UNIT II

Values and Religion: Karma Yoga in Hinduism – Love and Justice in Christianity – Brotherhood in Islam – Compassion in Buddhism – Ahimsa in Jainsm and Courage in Sikhism – Need for Religious Harmony.

UNIT III

Values and Society: Definition of Society – Democracy – Secularism – Socialism – Gender Justice – Human Rights – Socio Political Awareness – Social Integration – Social Justice.

UNIT IV

Professional Values: Definition – Accountability – Willingness to Learn – Team Spirit – Competence Development – Honesty – Transparency – Respecting Others – Democratic Functioning – Integrity and Commitment.

UNIT V

Role of Social Institutions in Value Formation: Social Institutions – Role of Family – Educational Institutions – Society – Peer Groups – Mass Media.

Reference:

1. **"Value Education"** – Raghu Nathan N.S.Margham Publications.
2. **"Values in Education"** –Subramanian K, Madurai, Ramana publications, 1995
3. **"Indian Social Institutions"–** Doss, A.G.., Delhi: Forward Publishing Company, 2000
4. **"A Creative Response to Consumerism and Communalism"** – Joseph K.P, Hyderabad: National Institute of Peace and Value education, 2003
5. **"What Went Wrong.... and Continues"** – Bedikiran, Delhi: UBS publishers and Distributor's pvt.ltd. 2005
6. **"Personality"** –Tagore Rabindranath, New Delhi: Macmillan ISndia ltd.
7. **"Quess for Harmony"** An Anthology of Religions in Dialogue – Sekar, Vincent, Bangalore Claretian Publications, 2001.