

GURU NANAK COLLEGE (AUTONOMOUS)

(Affiliated to University of Madras and Re-Accredited at 'A' Grade by NAAC)

Velachery Main Road, Velachery, Chennai – 600042.



Bachelor of Computer Applications - BCA

(SEMESTER PATTERN WITH CHOICE BASED CREDIT SYSTEM)

Syllabus

(For the candidates admitted in the Academic year 2017-18 and thereafter)

Vision

To impart essential knowledge in Information technology to the student community, enhance their ability to apply the knowledge gained and be successful in their professional and social life and thrive for the upliftment of the society.

Mission

- Inculcate students and equip them with global technological skills in Information Technology, that enhance them to be innovative, have lateral thinking and be good at problem-solving.
- Increase Industry - Institute Interaction to enlighten the students about the required skills to be successful in their career.
- Train and develop the students as IT professionals with confidence, competence, commitment and character

Programme Outcomes

PO1: Understand the concepts of key areas in computer Applications.

PO2: Analyze and apply latest technologies to solve problems in the areas of computer applications.

PO3: Analyze and synthesis computing systems through quantitative and qualitative techniques.

PO4: Apply technical and professional skills to excel in business.

PO5: Communicate effectively in both verbal and written form.

PO6: Develop practical skills to provide solutions to industry, society and business.

Programme Specific Outcomes

PSO 1 : Analyze customer requirements, apply knowledge of computing fundamentals, computing specialization and domain knowledge for the abstraction and conceptualization of computing models.

PSO 2 : Create high level design and develop reliable software systems.

PSO 3 : Able to use the techniques, skills and modern hardware and software tools necessary for innovative software solutions.

PSO 4 : Possess leadership and managerial skills with best professional ethical practices and social concern.

PSO 5 : Able to work collaboratively as a member or leader in multidisciplinary teams.

COURSE STRUCTURE
BACHELOR OF COMPUTER APPLICATION (B.C.A)
2017-18 Batch onwards

Semester	Part	Course Component	Subject Code	Subject Name	Credits	Hours	Internal	External	Total
Semester - I	I	Language	17UTAMF01	Tamil – I	3	6	50	50	100
	II	English	16UENGF21	English – I	3	4	50	50	100
	III	Core Paper-I	16UBCAC01	Programming in C	4	6	50	50	100
	III	Core Paper-II	16UBCAC02P	Practical – C Programming	4	4	50	50	100
	III	Allied-I	16UMATA11	Mathematics I	5	6	50	50	100
	IV	Non Major Elective-II/ Basic/ Advance Tamil	16UNME01K	Practical - Computing Skills	2	2	-	100	100
	IV	Soft Skills-I	17UGSLS01	Listening and Speaking skill	3	2	-	100	100
Total Credits: 24 / Total Hours per week: 30									
Semester - II	I	Language	17UTAMF02	Tamil – II	3	6	50	50	100
	II	English	16UENGF22	English – II	3	4	50	50	100
	III	Core Paper-III	17UBCAC03	Digital Logic Fundamentals and Microprocessor	4	5	50	50	100
	III	Core Paper-IV	16UBCAC04P	Practical – Microprocessor	4	5	50	50	100
	III	Allied-II	16UMATA15	Mathematics II	5	6	50	50	100
	IV	Non Major Elective-II/ Basic/ Advance Tamil	16UNME02KP	Practical – HTML	2	2	-	100	100
	IV	Soft Skills-II	17UGSLS02	Reading and Writing Skills	3	2	-	100	100
Total Credits: 24 / Total Hours per week: 30									
Semester - III	III	Core Paper-V	16UBCAC05	Data Structure and Algorithms	4	5	50	50	100
	III	Core Paper-VI	16UBCAC06	Programming in C++	4	6	50	50	100
	III	Core Paper-VII	16UBCAC07P	Practical – Data Structures using C++	4	5	50	50	100
	III	Core Paper-VIII	16UBCAC08	Operations Research	4	6	50	50	100
	III	Allied-III	16UBCAA03	Financial Accounting	5	6	50	50	100
	IV	Soft Skills-III	16UGSLS03	Personality Enrichment	3	2	-	100	100
Total Credits: 24 / Total Hours per week: 30									
Semester - IV	III	Core Paper-IX	16UBCAC09	Java Programming	4	6	50	50	100
	III	Core Paper-X	16UBCAC11	Computer Architecture	4	8	50	50	100
	III	Core Paper-XI	16UBCAC10P	Practical - Java Programming	4	6	50	50	100
	III	Allied-IV	16UBCAA04	Cost and Management Accounting	5	6	50	50	100
	IV	Soft Skills-IV	16UGSLS05	FLASH Lab	3	2	-	100	100
	IV	EVS	16UEVS401	Environmental Studies	2	2	-	100	100
Total Credits: 22 / Total Hours per week: 30									
Semester - V	III	Core Paper XII	17UBCAC12	Relational Database Management System	4	6	50	50	100
	III	Core Paper XIII	16UBCAC13	Operating System	4	6	50	50	100
	III	Core Paper XIV	16UBCAC14P	Practical – RDBMS	4	6	50	50	100
	III	Elective-I	16UBCAE02	Refer Annexure – I (Visual Programming)	5	6	50	50	100
	III	Elective-II	17UBCAE01	Refer Annexure – I (E-Commerce)	5	5	50	50	100
	IV	Value Education	16UVED401	Value Education	2	1	-	100	100
Total Credits: 24 / Total Hours per week: 30									
Semester - VI	III	Core Paper-XV	17UBCAC15	PHP Scripting Language	2	3	50	50	100
	III	Core Paper-XVI	16UBCAC16	Software Engineering	4	6	50	50	100
	III	Core Paper-XVII	17UBCAC17	Data Communication and Networking	4	6	50	50	100
	III	Core Paper-XVIII	16UBCAC18	Mini Project	4	6	50	50	100
	III	Core Paper-XIX	17UBCAC19P	Practical – PHP	2	3	50	50	100
	III	Elective-III	17UBCAE03	Refer Annexure – I (Cloud Computing)	5	6	50	50	100
	V	Extension Activity	17UEXT501	Extension Activity	1	-	-	-	-
Total Credits: 24 / Total Hours per week: 30									
Grand Total Credits: 140 / Total Hours per week: 180									

ANNEXURE - I

COURSE COMPONENT	SUBJECT NAME
Elective – I	<ol style="list-style-type: none">1. Visual Programming2. Unix Programming3. Data Mining
Elective - II	<ol style="list-style-type: none">1. IDE- Practical - Introduction to Web Designing(HTML & CSS)2. E-Commerce3. Client/Server Computing
Elective - III	<ol style="list-style-type: none">1. Cloud Computing2. Software Testing3. Distributed Computing

- Examination will be held in the even semester.

**PART III - CORE I
PROGRAMMING IN C LANGUAGE**

SUBJECT CODE : 16UBCAC01	THEORY	MARKS : 100
SEMESTER : I	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the basic concepts of C programming
- This course is designed to expand the knowledge of C programs by teaching some of the more advanced features of the C language
- The course material includes many examples. Since an understanding of the topics of this course is a basic need of every student who wants to excel in C programming, the course includes many opportunities for hands-on experience

UNIT I (18hrs)

Introduction to Computer - Fundamental Character set - Identifier and Keywords - Data types - Constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and Logical, Assignment and Conditional Operators - Library functions.

UNIT II (18hrs)

Data Input Output functions - Simple C programs - Flow of control - if, if-else, While, Do-while, for loop, Nested control structures - Switch, Break and Continue, Go to statements - Comma operator.

UNIT III (18hrs)

Functions –Definition - Proto-types - Passing arguments – Recursions- Storage Classes - Automatic, External, Static, Register Variables – Multi-file programs.

UNIT IV (18hrs)

Arrays - Defining and Processing - Passing arrays to functions – Multi-dimension arrays - Arrays and String. Structures - User defined data types - Passing structures to functions - Self-referential structures – Unions - Bit wise operations.

UNIT V (18hrs)

Pointers-Declarations- Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers – Files- Creating, Processing, Opening and Closing a data file.

1. PRESCRIBED BOOKS:

- i. E.Balaguruswamy, 1995, Programming in ANSI C, TMH Publishing Company Ltd.

2. REFERENCE BOOKS:

- i. H. Schildt, 2004, The Complete Reference, 4th Edition, TMH
- ii. Gottfried, B.S, 1996, Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi.
- iii. Kanetkar Y, 1999, Let us C, BPB Publications., New Delhi.

iv. Kamthane, 2002, Programming with ANSI & Turbo C, First Edition, Pearson Education, New Delhi

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit – 5	1	

PART – III - CORE - II

PRACTICAL – C PROGRAMMING LAB

SUBJECT CODE : 16UBCAC02P	PRACTICAL	MARKS : 100
SEMESTER : I	CREDITS : 4	NO. OF HOURS : 60

COURSE OBJECTIVES:

This course gives exposure to hands on training in C programming

- To familiarize the student with basic concepts of computer programming and developer tools.
- To present the syntax and semantics of the “C” language as well as data types offered by the language
- To allow the student to write their own programs using standard language infrastructure regardless of the hardware or software platform

PROGRAMS:

Summation of Series:

1. Sin(x),
2. Cos(x),
3. Exp(x) (Comparison with built in functions)

String Manipulation:

1. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
2. Reverse a String & check for palindrome.

Recursion:

1. ${}^n P_r$, ${}^n C_r$
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum

Matrix Manipulation:

1. Addition & Subtraction
2. Multiplication
3. Transpose of a matrix

**PART – III ALLIED - 1
MATHEMATICS – I**

SUBJECT CODE : 16UMATA11	THEORY	MARKS : 100
SEMESTER : I	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES:

- To improve basics in Mathematics and analytical skills

UNIT I (18hrs)

ALGEBRA: Summation of Series - Binomial, Exponential and Logarithmic Series (Without proof) and Simple Problems. Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3

UNIT II (18hrs)

MATRICES: Eigen Values – Eigen Vectors - Cayley - Hamilton Theorem (without proof) Chapter 4 Section 4.5, 4.5.2, 4.5.3

UNIT III (18hrs)

THEORY OF EQUATIONS: Polynomial equations, irrational roots, complex roots, Reciprocal equations - Approximation of roots of a polynomial equation by Newton's Method Chapter 3, Section 3.1 to 3.4.1

UNIT IV (18hrs)

DIFFERENTIAL CALCULUS: n^{th} derivatives - Leibnitz Theorem - Jacobians -Radius of Curvature (Cartesian Coordinates only) – Maxima and Minima of functions of two variables. Chapter 1, Section 1.1.1 to 1.3.1 and Section 1.4.3

UNIT V (18hrs)

TRIGONOMETRY: Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$ - Hyperbolic and Inverse hyperbolic functions. Chapter 6, Section 6.1 to 6.3.

Content and treatment as in

Allied Mathematics Volume I and II by P. Duraipandian and S. Udayabaskaran, S. Chand Publications

1. PRESCRIBED BOOKS:

- Allied Mathematics, A. Singaravelu.
- Ancillary Mathematics, A. Manickavasagam Pillai and Narayanan.
- Allied Mathematics, P.R. Vittal.

2. REFERENCE BOOKS

- Allied Mathematics, S.G. Venkatachalapathy
- P. Kandasamy and K. Thilagavathi, Allied Mathematics Volume I and Volume II -- 2004, S. Chand and Co, New Delhi.
- Ancillary Mathematics Volume 1 and 2 by P. Balasubramanian & K.G. Subramanian.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
Section A	Definition/Principle Answer any 10 out of 12 questions	1 – 12	3	30
Section B	Short Answer Answer any 5 out of 7 questions	13–19	6	30
Section C	Essay Answer any 4 out of 6 questions	20– 25	10	40
TOTAL				100

DISTRIBUTION OF QUESTIONS:

Sections	Units	No. of Questions	
		Theory	Problems
Section A	Unit – 1		2
	Unit – 2	1	2
	Unit – 3	1	1
	Unit – 4		2
	Unit – 5	1	2
Section B	Unit – 1		2
	Unit – 2		2
	Unit – 3		2
	Unit – 4		1
	Unit – 5		1
Section C	Unit – 1		1
	Unit – 2		2
	Unit – 3		1
	Unit – 4		1
	Unit - 5		1

PART – IV - NON MAJOR ELECTIVE

PRACTICAL - COMPUTING SKILLS

SUBJECT CODE : 16UNME01K	PRACTICAL	MARKS : 100
SEMESTER : I	CREDITS : 2	NO. OF HOURS : 30

COURSE OBJECTIVES:

- The major objective in introducing the Computer Skills course is to impart training for students in Microsoft Office which has different components like Ms Word, MS Excel, Ms Access, Power point etc., at two levels based on their knowledge and exposure.
- It provides essential skills for the user to get adapted to any work environment, as most of the systems in any workplace have Ms Office installed for their day to day activities. The course is highly practice oriented rather than regular class room teaching

UNIT I : (6hrs)

INTRODUCTION TO COMPUTERS – Classification of Computers; Role of Computers in society; Inside Computers – Hardware (processing, memory, i/o, storage), Software(systems, application), CPU, OS (DOS, Windows, Unix, Linux), Storage devices; Programming – Overview, Need for languages, Skills; Networking Basics; Virus; Hacking

UNIT II : (6hrs)

WORD PROCESSING – Open, Save and Close word document; Editing text- tools, Formatting, bullets; Spell Checker; Navigating in word – keyword, Mouse; Document formatting- Paragraph alignment, Indentation, Headers and Footers, Numbering; printing- preview, options

UNIT III : (6hrs)

FILE MANAGEMENT - Understanding the importance file management, Backing of files, Navigating through My Computer and Windows Explorer; Files and Folders – Editing, Retrieving, Deleting, Renaming , Subfolders – Manipulate windows – Maximize, Minimize; Power point basics – Terminology, Templates, Viewing.

UNIT IV : (6hrs)

SPREADSHEETS – MS Excel – Opening, Entering text and data, Formatting, Navigating; Formulas – Entering, Handling and Copying; Charts –Creating, Formatting and Printing, Header and Footer, Centering data, Printing

UNIT V : (6hrs)

NETWORKS – Internet Explorer- Components; Www – Working, Browsing, Searching, Saving – Bookmark – Favorite, Create, Delete – Printing a Web Page; Email- Creating, Receiving, Reading And Sending Messages

Note : Unit II To Unit V Needs Exposure Thru Practicals

1.REFERENCE BOOKS:

1. Introduction to Computers – Peter Norton, Tata McGraw Hill
2. Microsoft 2003 – Jennifer Ackerman Kettell, Guy Hat-Davis, Curt Simmons, Tata McGraw Hill
3. HTML – Laura Lemay.
4. HTML – E Stephen Mack, Janan Platt.

PART – III CORE - III
DIGITAL LOGIC FUNDAMENTALS & MICROPROCESSOR

SUBJECT CODE : 17UBCAC03	THEORY	MARKS : 100
SEMESTER : II	CREDITS : 4	NO. OF HOURS : 75

COURSE OBJECTIVES:

- This course probes fundamental ideas of Basic Digital Electronics and Microprocessor subject seeking to provide wide exposure to the basic concepts of Digital Electronics along with the dynamic implementations of these concepts into Computer hardware.
- This three unit course provides an introduction to microprocessors. It uses assembly language to develop a foundation on the hardware, which executes a program. Memory and I/O interface design and programming.

UNIT I **(15hrs)**
Fundamentals of Computer - Number Systems - Conversion from One Number System to Another - Logic Gates - Truth Tables. Boolean Algebra - Axioms - Truth Table Simplification of Boolean Function - K - Map Method

UNIT II **(20hrs)**
Brief discussion about Combinational Circuits and Sequential Circuits : Adders (Half Adder, Full Adder), Subtractors (Half Subtractor, Full Subtractor) – Decoder – Encoder – Multiplexers – Demultiplexers – Flip Flops- RS, JK, D and T Flip flops

UNIT III **(15hrs)**
Introduction to Microcomputers - Microprocessor-Intel 8085 Microprocessor - Architecture – Pin out of 8085 - MPU 8085 – 8085 Instruction Set and Classifications – Instruction formats - Addressing modes.

UNIT IV **(10hrs)**
8085 Assembly Language Programs: Simple Programs – 8 –Bit Addition and Subtraction, BCD Addition-BCD Subtraction -Multiplication and Division -Programming Techniquessuch as Looping - Dynamic Debugging.

UNIT V **(15hrs)**
Peripheral and Interfacing : Peripheral Devices – Interfacing - Memory Mapped I/O and I/O Mapped I/O-:Interrupts In 8085 –Vectored Interrupts - Programmable Peripheral Interface-DMA.

1. PRESCRIBED BOOKS

1. M.M. Mano, Digital Logic and Computer Design, Pearson Education .
2. V.Rajaraman,2002, Fundamentals of Computers, Third Edition, PHI, New Delhi.
3. B. Ram, Microprocessor and its Architecture.
4. Ramesh S. Gaonkar, Microprocessor architecture programming and its applications with 8085, Third Edition

2. REFERENCE BOOKS:

1. T.C.Bartee, 1991,Computer Architecture and logical Design, McGraw Hill.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

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		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III CORE IV

PRACTICAL - MICROPROCESSOR LAB

SUBJECT CODE : 16UBCAC04P	PRACTICAL	MARKS : 100
SEMESTER : II	CREDITS : 4	NO. OF HOURS : 75

COURSE OBJECTIVES:

- This course gives hands on training in Microprocessor Assembly Language Programming
- It uses assembly language to develop a foundation on the hardware, which executes a program. Laboratories directly related to microprocessor functions and its interfaces

PROGRAMS:

1. 8 –bit Addition and Subtraction
2. BCD addition and subtraction
3. Multi byte Addition and Subtraction
4. Find the largest – two 8 bit values
5. Find the smallest – two 8 bit values
6. Find the largest number in an array
7. Find the smallest number in an array
8. Sum of series – 8 bit Hexa Decimal Numbers
9. Sum of series – BCD numbers
10. Arrange the given numbers in Ascending and Descending order
11. Find the square of given number by using look-up table

PART – III - ALLIED II

MATHEMATICS – II

SUBJECT CODE : 16UMATA15	THEORY	MARKS : 100
SEMESTER : II	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES:

- To improve basics in mathematics and analytical skills

UNIT-I: (18hrs)

INTEGRAL CALCULUS :- Bernoulli's formula – Reduction formula for $\int \text{Sin}x \, dx$ - $\int \text{Cos}x \, dx$.

Chapter 2, Sections 2.7 and 2.9

UNIT- II: (18hrs)

FOURIER SERIES :Fourier series for function in $(\alpha, \alpha + 2\pi)$, Half-range Sine and cosine series Chapter 4, Section 4.1 to 4.2

UNIT – III: (18hrs)

DIFFERENTIAL EQUATION : Second order Differential Equation with Constant Coefficient s. Differential equation of the form $(aD^2+bD+C)y = e^{ax} \phi(x)$ where a, b, c are constants, $\phi(x) = \text{Sin} \, mx$ (or) $\text{Cos} \, mx$ (or) x^m .

PARTIAL DIFFERENTIAL EQUATION : Eliminating Arbitrary constants and functions - Four Standard types. $f(p,q) = 0$; $f(x,p,q) = 0$, $f(y,p,q) = 0$, $f(z,p,q) = 0$. Chapter 5, Section 5.2, 5.2.1, Chapter 6, Section 6.1 to 6.3

UNIT – IV: (18hrs)

LAPLACE TRANSFORMATION - Basic Properties and Simple Problems - $L [e^{at} f(t)]$ - $L [t^n f(t)]$ - $L [e^{at} f(t)]$ - $L [f(t)/t]$. Chapter 7, Section 7.1.1 to 7.1.4

UNIT – V : (18hrs)

INVERSE LAPLACE TRANSFORMATION : - Solving Differential Equation using Laplace Transformation. Chapter 7, Section 7.2 to 7.3

Content and treatment as in

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	Unit – 2	1	2
	Unit – 3	1	1
	Unit – 4		2
	Unit – 5	1	2
Section B	Unit – 1		2
	Unit – 2		2
	Unit – 3		2
	Unit – 4		1
	Unit – 5		1
Section C	Unit – 1		1
	Unit – 2		2
	Unit – 3		1
	Unit – 4		1
	Unit - 5		1

PART – IV NON-MAJOR ELECTIVE

PRACTICAL – HTML LAB

SUBJECT CODE : 16UNME02KP	PRACTICAL	MARKS : 100
SEMESTER : II	CREDITS : 2	NO. OF HOURS :30

COURSE OBJECTIVES:

- This course introduces to the programming in HTML

PROGRAMS:

1. Write a script to create an array of 10 elements and display its contents.
2. Create a simple calculator using form fields. Have two fields for number entry and one field for the result. Allow the user to be able to use plus, minus, multiply and divide.
3. Create a document and add a link to it. When the user moves the mouse over the link, it should load the linked document on its own. (user is not required to click on the link)
4. Create a document which opens a new window without a toolbar, address bar or a status bar that unloads itself after one minute.
5. Design an HTML page that includes document structure tags, title, line break, multiple headings and link to e-mail address.
6. Create an HTML file which is the main page with an image and some text messages along with hyperlinks which is linked to various pages. The navigation should be such that the links take you to the appropriate page and then back to the main page.
7. Create a HTML page to demonstrate the usage of Frames. Choose the content of the page on your own.
8. Design an application for pay slip through HTML forms.
9. Make a page with a heading. Make the heading large, bold, italic and center it across the top of the page.
10. Design a Web Page for Student Information System.

PART – III - CORE - V
DATA STRUCTURE AND ALGORITHMS

SUBJECT CODE : 16UBCAC05	THEORY	MARKS : 100
SEMESTER : III	CREDITS : 4	NO. OF HOURS : 75

COURSE OBJECTIVES:

- This course introduces fundamental data structures, algorithms, and abstract data types. Main topics include data structures such as arrays, linked lists, stacks, queues, graphs, and trees, and algorithms such as those that are used for list manipulation, graph searches, sorting, searching, and tree traversals.
- Design algorithms for solving problems that use data structures such as arrays, linked lists, stacks, queues, graphs, and trees, and algorithms such as those that are used for list manipulation, graph manipulation (e.g., depth-first search), sorting, searching, and tree traversals

UNIT - I: **(10hrs)**
Definition of a Data Structure - Primitive and Composite Data Types, Asymptotic Notations, Arrays, Operations on Arrays, Order Lists.

UNIT - II: **(15hrs)**
Stacks - Applications of Stack - Infix to Postfix Conversion, Recursion, Maze Problems - Queues - Operations on Queues, Queue Applications, Circular Queue.

UNIT - III : **(20hrs)**
Singly Linked List - Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List - Operations, Applications - Ordering of Books in Library (Alphabetical Ordering).

UNIT - IV: **(20hrs)**
Trees and Graphs: Binary Trees - Conversion of Forest to Binary Tree, Operations - Tree Traversals; Graph - Definition, Types of Graphs, Hashing Tables and Hashing Functions, Traversal - Shortest Path; Dijkstra's Algorithm.

UNIT - V: **(10hrs)**
Algorithm - Definition - Examples - Complexity - Divide and Conquer - Binary Search - Maximum and Minimum - Merge Sort.

1. PRESCRIBED BOOKS:

1. E.Horowitz and S. Shani Fundamentals of Data Structures in C++, Galgotia Pub. 1999.

2. REFERENCE BOOKS:

1. Horowitz, S. Sahni, and S. Rajasekaran, Computer Algorithms, Galgotia Pub. Pvt. Ltd., 1998.
2. R. Kruse C.L. Tondo and B. Leung, Data Structures and Program design in C, PHI, 1997.

QUESTION PAPER PATTERN:

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	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III CORE - VI

PROGRAMMING IN C++

SUBJECT CODE : 16UBCAC06	THEORY	MARKS : 100
SEMESTER : III	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the basic concepts of C++ programming
- Acquire an understanding of basic object oriented concepts and the issues involved in effective class design
- In order to write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc

UNIT I (18hrs)

Principles of Object- Oriented Programming – Beginning with C++ - Tokens, Expressions and Control Structures – Functions in C++

UNIT II (18hrs)

Classes and Objects – Constructors and Destructors – New Operator – Operator Overloading and Type Conversions

UNIT III (18hrs)

Inheritance: Extending Classes – Pointers- Virtual Functions and Polymorphism

UNIT IV (18hrs)

Managing Console I/O Operations – Working with Files – Templates – Exception Handling

UNIT V (18hrs)

Standard Template Library – Manipulating Strings – Object Oriented Systems Development

1. PRESCRIBED BOOKS:

1. E. Balagurusamy, 1995, Object Oriented Programming with C++, Tata McGraw-Hill Publishing Company Ltd.

2. REFERENCE BOOKS:

1. Robert Lafore, Object Oriented Programming in Microsoft C++, Galgotia publication.
2. H.Schildt, C++, 1998, The Complete Reference-1998-TMH Edition, 1998
3. Barbara Johnston, C++ Programming today, Pearson education/Prentice-Hall of India, ISBN81-317-1079-3, 2007.
4. Steve Oualline, Practical C++ programming, O'Reilly/Shroff publishers & distributors, ISBN81-7366-682-2.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III - CORE - VII

PRACTICAL - DATA STRUCTURES USING C++ LAB

SUBJECT CODE : 16UBCAC07P	PRACTICAL	MARKS : 100
SEMESTER : III	CREDITS : 4	NO. OF HOURS : 75

COURSE OBJECTIVES:

- This course deals with practical implementation of Data Structure using C++

PROGRAMS:

1. Implement PUSH, POP operations of stack using Arrays.
2. Implement PUSH, POP operations of stack using Pointers.
3. Implement add, delete operations of a queue using Arrays.
4. Implement add, delete operations of a queue using Pointers.
5. Conversion of infix to postfix using stack operations
6. Postfix Expression Evaluation.
7. Addition of two polynomials using Arrays and Pointers.
8. Creation, insertion, and deletion in doubly linked list.
9. Binary tree traversals (in-order, pre-order, and post-order) using linked list.
10. Depth First Search and Breadth first Search for Graphs using Recursion.

PART - III CORE - VIII
OPERATIONS RESEARCH

SUBJECT CODE : 16UBCAC08	THEORY	MARKS : 100
SEMESTER : III	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- To give an overall idea about the various Optimization techniques and their usages

UNIT – I : **(18hrs)**

Introduction to Operations Research - Linear Programming - Formulation - Graphical Solution - Simplex method.

Chapter 1, Section 1.1 to 1.4

Chapter 2, Section 2.1 to 2.28

Chapter 3, Section 3.1 to 3.54

Chapter 4, Section 4.1 to 4.31

UNIT II : **(18hrs)**

Big-M Method – Two-Phase method – Duality Dual-Primal relation – Dual Simplex Method.

Chapter 5, Section 5.1 to 5.14

Chapter 6, Section 3.1 to 6.35

Chapter 7, Section 7.1 to 7.37

Chapter 8, Section 8.1 to 8.35

UNIT – III : **(18hrs)**

Transportation Problem - Assignment Problem.

Chapter 10, Section 10.1 to 10.73

Chapter 11, Section 11.1 to 11.6

UNIT – IV : **(18hrs)**

Sequencing problem, n jobs through 2 machines ,n jobs through 3 machines , 2 jobs through m machines , n jobs through m machines

Chapter 12, Section

Game theory : Two person – Zero game with saddle point – without saddle point –

Dominance – solving 2 x n game or m x 2 game by graphical method

Chapter 15,

UNIT – V : **(18hrs)**

PERT – CPM : Project Network Diagram – Critical Path (Crashing excluded) – PERT computation

Chapter 14, Section 14.1 to 14.70

Content and treatment as in Operations Research by P.R.Vittal and V.Malini

1. PRESCRIBED BOOKS:

1. V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan – Resource Management Techniques (Operations Research).
2. Introduction to Operations Research, P.R.Vittal
3. Gupta P.K. and HiraD.S.Problems in Operations Research, S.Chand& Co.

2. REFERENCE BOOKS:

1. KantiSwaroop, Gupta P.K. and Manmohan – Problems in Operations Research, Sultan Chand & Sons.
2. Ravidran A., Philips,D.T. and Solberg J.J.,Operations Research, John Wiley & sons.
3. Taha H.A., Operations Research, Macmillian Publishing company, Newyork.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
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C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	2	1
	Unit – 5	2	1
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	1	1
	Unit – 4	1	1
	Unit – 5	1	1
C	Unit – 1	1	
	Unit – 2	1	1
	Unit – 3		1
	Unit – 4		1
	Unit - 5		1

PART - III - ALLIED – III
FINANCIAL ACCOUNTING

SUBJECT CODE : 16UBCAA03	THEORY	MARKS : 100
SEMESTER : III	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the concepts of Financial Accounting.

UNIT-I: (20hrs)
Meaning and Scope of Accounting - Basic Accounting Concepts and Conventions Objectives of Accounting - Accounting Transactions - Double Entry Book Keeping Journal, Ledger, Preparation of Trial Balance.

UNIT-II: (16hrs)
Preparation of final accounts of sole trading concerns.

UNIT-III: (18hrs)
Adjustments to final accounts of sole trading concern - Bank Reconciliation Statement(BRS).

UNIT-IV: (18hrs)
Depreciation Meaning, Causes, Types problems based on straight line and diminishing Balance methods.

UNIT-V: (18hrs)
Meaning, Features, Defects, Statement of Affairs Method and Conversion Method (Problems on Statement of Affairs method only).

PRESCRIBED BOOKS AND REFERENCE BOOKS:

1. Gupta R.L, Advanced Accountancy, S.Chand, Delhi.
2. Agarwala A.N, Higher Science of Accountancy, Kitab Mahal,Allahabad.
3. S.P. Jain and K.L. Narang, Financial Accounting
4. M.C.Shukla and T.S.Grawel, Adavnced Accounts(Vol. I)
5. Gillespie Accounting system, Procedure & methods, Prentice Hall India Ltd, New Delhi.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	2	20
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	8	40
C	Essay Answer any 2 out of 4 questions (each in 600 words)	21-24	20	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	1
	Unit – 2	2	1
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
B	Unit – 1	1	1
	Unit – 2		1
	Unit – 3	1	1
	Unit – 4	1	1
	Unit – 5		1
C	Unit – 1		1
	Unit – 2		1
	Unit – 3	-	-
	Unit – 4		1
	Unit – 5		1

PART – IV - SOFT SKILL – III

PERSONALITY ENRICHMENT

SUBJECT CODE :16UGSLS03	THEORY	MARKS : 100
SEMESTER : III	CREDITS : 3	NO. OF HOURS : 30

COURSE OBJECTIVES:

- To make students understand the concepts and components of personality, thereby to apply the acquired knowledge to themselves and to march towards excellence in their respective academic careers.
- To enable students to keep themselves abreast of general knowledge and current information.
- To bring out creativity and other latent talents with proper goal setting so that self-esteem gets enhanced.
- To sharpen memory skills and other study skills which are vital for academic excellence.
- To give training for positive thinking which will keep the students in a good stead at the time of crisis.

UNIT I- Self Disclosure

(6hrs)

Characteristics of Self Disclosure – Self disclosure benefits and appropriateness – Self disclosure and Self awareness – Self disclosure and feedback.

Exercise:

1. Self Description– Reflect and answer the following questions on a sheet of paper about yourself: Who am I? What am I like? How do others perceive me? What are my strengths as a person? In what areas do I want to develop greater skills?
2. Adjective Checklist – the following exercise is aimed at providing an opportunity for participants to disclose their view of themselves to the other members of their group and to receive feedback on how the other group members perceive them.
3. Self Disclosure and Self Awareness – The purpose of this exercise is to allow participants to focus on the areas as described in the Johari Window.

UNIT II – Anger, Stress and Managing Feelings

(6hrs)

The Nature of Stress- Managing Stress Through Social Support Systems – The Nature of Anger –Guidelines for Managing Anger Constructively – Dealing with an Angry Person

Exercise:

1. Handling put downs techniques practiced through role plays.
2. Changing your feelings discuss how people can make their assumptions more constructively.
3. Defusing the Bomb exercise discuss how one can manage provocations.

UNIT III – Interpersonal Effectiveness (6hrs)

Managing Anxiety and Fear – Breathing – An Antidote to Stress – Progressive Muscle Relaxation – Understanding your Shyness – Building One’s Self Esteem – Avoiding Self Blame – Taking Risks, Tolerating Failure, Persisting And Celebrating Success – Self Talk.

Exercise:

1. Being positive about yourself
2. Understanding your shyness analyze the social situation of shyness and the causes of your shyness.
3. Systematic Muscle Relaxation train one in the procedure for systematic muscle relaxation.
4. Learning how to breathe deeply help one to relax systematically when one is anxious by controlling one’s breathing.

UNIT IV: Study Skills (6hrs)

Importance of Study Environment – Using VCR3 to Increase Memory Power: Visualizing, Concentrating, Relating, Repeating, Reviewing- Memory Hindrances – Memory Helpers – Knowing Vs Memorizing – Memory and Studying – The SQ3R Method; Survey, Write Questions, Read, Recite, Review – Mnemonic Devices – Rhymes – Acronyms – Pegging – Cooperative Learning .

Exercise:

1. Using the techniques of memory enhancers to review your classroom and textbook notes

UNIT V: Goal Setting and Managing Time (6hrs)

The Basis of Effective Goals – Steps to be followed to obtain Optimum Results from Goal Setting – Identifying the Reasons for Procrastination – Guidelines to Overcome Procrastination – Priority Management at Home and College

Exercise:

1. Steps to prepare one’s short term goals and long term goals.
2. Role play activity through reelection of identifying how priority management affect one’s ability to live a balanced life.

REFERENCE BOOKS:

1. Johnson, D.W. (1997). Reaching out – Interpersonal Effectiveness and Self Actualization. 6th ed. Boston: Allyn and Bacon.
2. ed. Boston: Allyn and Bacon.
3. Sherfield, R. M. ; Montgomery, R.J. and Moody, P, G. (2010). Developing Soft Skills. 4th ed. New Delhi: Pearson.
4. Robbins, S. P. and Hunsaker, Phillip, L. (2009). Training in Interpersonal skills. Tips for managing people at work. 5th ed. New Delhi: PHI Learning.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Essay Answer any 5 out of 10 questions (each in 1200 words)	1-10	20	100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	

PART – III - CORE – IX

JAVA PROGRAMMING

SUBJECT CODE : 16UBCAC09	THEORY	MARKS : 100
SEMESTER : IV	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the concepts of Programming in JAVA.
- To understand Object oriented concepts like data abstraction, encapsulation, etc.
- To solve the real world scenarios using top down approach.
- To understand various Java programming concepts.

UNIT I (14hrs)

Introduction to Java – Features of Java – Object Oriented Concepts - Lexical Issues - Data Types - Variables Arrays – Operators - Control Statements.

UNIT II (22hrs)

Classes – Objects – Constructors - Overloading method – Access control - Static and fixed methods - Inner Class - String Class – Inheritance - Overriding Methods - Using Super - Abstract Class.

UNIT III (22hrs)

Packages Access Protection - Importing packages – Interfaces - Exception Handling - Throw and Throws – Thread – Synchronization – Messaging - Runnable Interface - Inter thread Communication – Deadlock - Suspending, Resuming and Stopping Threads Multithreading.

UNIT IV (14hrs)

I/O Streams – File Streams – Applets - String Objects - String Buffer - Char Array - Java Utilities - Code Documentation.

UNIT V (18hrs)

Networks Basics – Socket Programming – Proxy Server - TCP/IP Sockets - Net Address – URL – Data grams - Working With Windows Using AWT Classes - AWT Controls - Layout Managers and Menus.

1. PRESCRIBED BOOKS:

1. P. Naughton and H. Schildt - Java2 (The complete Reference) - Third edition, TMH 1999.
2. Cay S. Horstmann, Gary cornel 1 - Core Java 2 Volume I – Fundamentals, 5th Edn, PHI, 2000.

2. REFERENCE BOOKS:

1. K. Arnold and J. Gosling - The Java Programming Language - Second Edition, Addison Wesley, 1996.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 1200 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III - CORE – X
COMPUTER ARCHITECTURE

SUBJECT CODE : 16UBCAC11	THEORY	MARKS : 100
SEMESTER : IV	CREDITS : 4	NO. OF HOURS : 120

COURSE OBJECTIVES:

- These courses introduce the Basic components of Computer and explain their function.
- To conceptualize the basics of organizational and architectural issues of a digital Computer.
- To analyze performance issues in processor and memory design of a digital Computer.
- To understand various data transfer techniques in digital computer.
- To analyze processor performance improvement using instruction level parallelism

UNIT I **(24hrs)**

Digital Logic Circuits: Digital Computers – Logic Gates – Boolean Algebra – Combinational Circuits and Flip Flops – Sequential Circuits.

UNIT II **(24hrs)**

Digital Components: Integrated Circuits - Decoders – Multiplexers – Registers and Counters – Memory Unit.

UNIT III **(24hrs)**

Data Representation: Data Types – Complements – Fixed Point & Floating Point Representation – Binary Codes - Error Detection Codes.

UNIT IV **(24hrs)**

Register Transfer – Bus and Memory Transfer – Arithmetic, Logic & Shift Micro Operations - Arithmetic Logic Shift Unit.

UNIT V **(24hrs)**

Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Program Control - Reduced Instruction Set Computing (RISC).

1. PRESCRIBED BOOKS:

1. Computer System Architecture: M.Morris Mano , ThirdEdition, Prentice Hall of India.

2. REFERENCE BOOKS:

1. Computer Organization and Programming – C.W. Gean

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III CORE – XI

PRACTICAL - JAVA PROGRAMMING LAB

SUBJECT CODE : 16UBCAC10P	PRACTICAL	MARKS : 100
SEMESTER : IV	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course gives hands on training in JAVA.

PROGRAMS:

1. To read student marks for five subjects and print the total and average.
2. Finding the largest among three numbers.
3. To implement the concept of method overloading.
4. To convert the given temperature in Fahrenheit to Celsius using the formula,
5. $C = F - 32/1.8$.
6. To find the factorial of the given number.
7. To compute Simple and Compound Interest.
8. To check whether the given number is Prime or not.
9. To check whether the given number is Armstrong or not.
10. To print Fibonacci series.
11. To check whether the given string is Palindrome or not.
12. Substring Removal from a String. Use String Buffer Class.
13. Finding area and Perimeter of Triangle. Use Stream class.(Circle & Rectangle)
14. Determining the order of numbers generated randomly using Random class.

Applets

15. String Manipulation using Char Array.
16. Incorporating Graphics.Working with Colors and Fonts.

PART – III - ALLIED – IV

COST AND MANAGEMENT ACCOUNTING

SUBJECT CODE : 16UBCAA04	THEORY	MARKS : 100
SEMESTER : IV	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the concepts of Cost and Management Accounting

UNIT-I: (15hrs)

Cost Accounting: Definition, Meaning and objectives - Distinction between Cost and Financial Accounting. Elements of cost and preparation of cost sheets and tender. Management Accounting – Definition and objectives – Distinction between management and financial accounting.

UNIT-II: (18hrs)

Stores Records - Purchase Order - Goods Received Note - Bin Card - Stores Ledger - Purchase, Receipt and Inspection - Inventory Control - ABC Analysis - Economic Ordering Quantity - Maximum, Minimum and Reordering levels - Methods of Pricing Issued.

UNIT-III: (18hrs)

Overheads: Factory, Administration, Selling and Distribution of Overheads - Classification - Allocation and Apportionment-Redistribution (Secondary Distribution) - Absorption of Overheads including 'Machine Hour Rate.

UNIT-IV: (21hrs)

Funds Flow and Cash Flow Analysis: Schedule of changes in working capital - Preparation of 'funds flow statement'-Preparation of 'Cash Flow Statement' - Importance of funds flow and cash flow Analysis - Difference between funds flow and cash flow.

UNIT-V: (18hrs)

Marginal Costing: The Concept - Break Even Analysis - Break - Even Chart - Importance and assumptions - Application of Profit Volumes Ratio - Different types of problems (with special emphasis on decision making problems).

1. PRESCRIBED BOOKS AND REFERENCE BOOKS

1. Wheldon A.J., Cost Accounting and Costing Methods.
2. Iyengar S.P., Cost Accounting : Principles and Practice.
3. Bhar B.K., Cost Accounting : Methods and problems.
4. Bigg W.W., Cost Accounts.
5. Prasad N.K, Cost Accounting : Principles and Problems.
6. Jain S.P. and Narang K.L., Advanced Cost Accounting.
7. Agarwal M., Theory and Practices of Cost Accounting
8. Robert Anthony : Management Accounting : Text and cases.
9. Maheswari S.N., Principles of Management Accounting.

QUESTION PAPER PATTERN:

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C	Essay Answer any 2 out of 4 questions (each in 600 words)	21-24	20	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	1	1
	Unit – 4	2	1
	Unit – 5	2	1
B	Unit – 1	2	
	Unit – 2		1
	Unit – 3		1
	Unit – 4	1	1
	Unit – 5		2
C	Unit – 1		1
	Unit – 2	-	-
	Unit – 3		1
	Unit – 4		1
	Unit – 5		1

PART – IV SOFT SKILL IV

FLASH Lab

SUBJECT CODE : 16UGSLS05	PRACTICAL	MARKS : 100
SEMESTER : IV	CREDITS : 3	NO. OF HOURS : 30

COURSE OBJECTIVES:

- Practical exercises based on concepts listed in theory using Flash.

PROGRAMS:

FLASH: Concept of Frame, Key frames, Frame rate, Timeline, Tween, Layers, Symbols, Embedding audio/video and embedding on the web page

1. Draw an animation to show a bouncing ball.
2. Draw an animation to show a moving stick man.
3. Draw an animation to show a fainting banana.
4. Draw an animation to show sunrise and sunset.
5. Draw an animation to show a disappearing house.
6. Draw an animation to show two boats sailing in river
7. Draw an animation to show a scene of cricket match.
8. Draw an animation to help teach a poem or a song
9. Draw an animation to show cartoon with a message
10. Make a movie showing Shape Tweening.
11. Make a movie showing Motion Tweening.
12. Add sound and button to the movie

PART - IV
EVS - ENVIRONMENTAL STUDIES

SUBJECT CODE : 16UEVS401	THEORY	MARKS : 100
SEMESTER : IV	CREDITS : 2	NO. OF HOURS : 30

COURSE OBJECTIVES:

- This course introduces the concepts of Environmental Studies

UNIT-I: (6hrs)

Multidisciplinary nature of environmental studies
Definition, Scope and Importance.

UNIT-II: (6hrs)

Natural Resources: Renewable and non-renewable resources:
Natural Resources and Associated Problems. - Forest Resources: Use and Over-Exploitation, Deforestation, Case Studies. - Timber Extraction, Mining, Dams and their Effects on Forest and Tribal People. - Water Resources: Use and Over-Utilization of Surface and Ground Water - Floods, Drought, Conflicts over Water, Dams-Benefits and Problems. - Mineral Resources: Use and Exploitation, Environmental Effects of Extracting and using Mineral Resources, Case Studies. - Food Resources: World Food Problems, Changes Caused by Agriculture and Overgrazing, Effects of Modern Agriculture, Fertilizer-Pesticide Problems, Water Logging, Salinity, Case Studies.

Energy Resources: Growing Energy Needs, Renewable and Non Renewable Energy Sources, Use of Alternate Energy Sources. Case Studies. Land Resources: Land as a Resource, Land Degradation, Man Induced Landslides, Soil Erosion and Desertification. Role of an Individual in Conservation of Natural Resources. Equitable Use of Resources for Sustainable Lifestyles.

UNIT-III: (6hrs)

Ecosystems - Concept of an Ecosystem. -Structure and Function of an Ecosystem. - Producers, Consumers and Decomposers. - Energy Flow in the Ecosystem. - Ecological Succession. - Food Chains, Food Webs and Ecological Pyramids. - Introduction, Types, Characteristic Features, Structure and Function of the Following Ecosystem: - . Forest Ecosystem, Grassland Ecosystem,. Desert Ecosystem,. Aquatic Ecosystems (Ponds, Streams, Lakes, Rivers, Oceans, Estuaries)

UNIT-IV: (6hrs)

Biodiversity and its Conservation

- Introduction – Definition: Genetic, Species and Ecosystem Diversity. - Biogeographically Classification of India - Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical, Aesthetic- and Option Values - Biodiversity at Global, National and Local Levels. - India as a Mega-Diversity Nation - Hot-Sports of Biodiversity.
- Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts.
- Endangered and Endemic Species of India
- Conservation of Biodiversity: In-Situ and Ex-Situ Conservation of Biodiversity.

UNIT-V : (6hrs)

Environmental Pollution

Definition

- Cause, Effects and Control Measures of :-

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and Industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster Management: Floods, Earthquake, Cyclone and Landslides.

1. PRESCRIBED BOOKS:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.

2. REFERENCE BOOKS:

1. Cunningham, W.P.Cooper, T.H. Gorhani, E & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
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B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit – 5	1	

PART – III - CORE – XII

RELATIONAL DATABASE MANAGEMENT SYSTEM

SUBJECT CODE : 17UBCAC12	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- To gain knowledge about the DML, DDL operations and to develop a Database with enhanced models and Techniques and to understand about RDBMS, Object oriented Databases and issues using MySQL and PL/SQL.

UNIT I (20hrs)

DBMS Definition – Characteristics of DBMS – Application and advantages of DBMS– Instances – Schemas and Database States – Three Levels of Architecture – Data Independence – DBMS languages– Data Dictionary– Database Users– Data Administrators.

UNIT II (10hrs)

Data Models– Types and their Comparison– Entity Relationship Model– Entity Types– Entity Sets– Attributes and its Types– Keys– E-R Diagram– Data Integrity– RDBMS : Concept– Components and Codd's rules.

UNIT III (20hrs)

Relational Algebra (Selection, Projection, Union, Intersection, Cartesian Product, Different types of join like Theta join– Equi-Join, Natural Join, Outer Join, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

UNIT IV (20hrs)

Introduction to SQL, DDL, DML, and DCL Statements– Creating Tables– Adding Constraints– Altering Tables, Update, Insert, Delete Tables & various form of SELECT– Simple, Using Special Operators for Data Access– Aggregate functions– Joining Multiple Tables (Equi Joins) – Joining a Table to itself (self Joins) Functions.

UNIT V (20hrs)

Introduction to PL/SQL (blocks of PL/SQL, Variables, and constants) – Control Structure – Introduction to Stored Procedures–Functions–Cursor and Triggers.

1. PRESCRIBED BOOKS:

1. Elmasri & Navathe, Fundamentals of Database systems, Addison & Weisely, New Delhi.

2. REFERENCE BOOKS:

1. H. F. Korth & A. Silverschatz, Database Concepts, Tata McGraw Hill, New Delhi
2. C. J. Date, Database Systems, Prentice Hall of India, New Delhi.
3. Ivan Bayross, SQL, PL/SQL, The programming language of Oracle.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

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	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III - CORE – XIII

OPERATING SYSTEM

SUBJECT CODE : 16UBCAC13	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- To provide core knowledge of Operating Systems features, functions and techniques. Each and every Operating System function is discussed in detailed. This course also provides an attempt to throw some light on the advanced topics in O/S like Multiprocessors systems and Distributed O/S. Case studies of WINDOWS and LINUX are organized at the end of this course so as to provide the support whatever they had pursued theoretically.
- To gain knowledge about operating system, memory management and scheduling concepts and to study about the basics of OS, process management, synchronization, memory management and File management.

UNIT I: (18hrs)

Introduction: Views –Goals –Types of System – OS Structure –Components – Services - System Structures – Layered Approach -Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling – Cooperating Process – Threads - Interprocess Communication. CPU Scheduling: CPU Schedulers – Scheduling Criteria – Scheduling Algorithms

UNIT II (20hrs)

Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlock: Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from Deadlock.

UNIT III (16hrs)

Memory Management: Address Binding – Dynamic Loading and Linking – Overlays – Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation. Non Contiguous Allocation: Paging and Segmentation schemes – Implementation – Hardware Protection – Sharing – Fragmentation.

UNIT IV (18hrs)

Virtual Memory: Demand Paging – Page Replacement - Page Replacement Algorithms – Thrashing. – File System: Concepts – Access methods – Directory Structure –Protection Consistency Semantics – File System Structures – Allocation methods – Free Space Management.

UNIT V (18hrs)

I/O Systems: Overview - I/O Hardware – Application I/O Interface – Kernel I/O subsystem – Transforming I/O Requests to Hardware Operations – Performance. Secondary Storage Structures: Protection – Goals- Domain Access matrix – The security problem – Authentication – Threats – Threat Monitoring – Encryption.

1. PRESCRIBED BOOKS:

1. Silberschatz A., Galvin P.B., Gange., 2002, Operating System Principles ,Sixth Edition, John Wiley & Sons.

2. REFERENCE BOOKS:

1. H.M. Deitel ,1990, An Introduction to Operating System,- Second Edition, Addison Wesley.
2. Andrew S.Tanenbaum, Modern Operating Systems, Pearson Education, II Ed.

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TOTAL MARKS				100

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	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit - 5	1	

PART – III - CORE – XIV

PRACTICAL - RDBMS LAB

SUBJECT CODE : 16UBCAC14P	PRACTICAL	MARKS : 100
SEMESTER : V	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVE:

- This course gives hands on training in RDBMS.
- Creating database objects, modifying database objects, manipulating the data, retrieving the data from the database server
- Performing database operations in a procedural manner using pl/sql
- Performing database operations (create, update, modify, retrieve, etc.) using front-end tools like D2K.
- Design and Develop applications like banking, payroll system, etc.,

PROGRAMS:

Create database and performing the operations given below using a menu driven Program:

(a) Insertion, (b) Deletion, (c) Modification, (d) Generating a reports (Simple) For the following systems using Visual Basic as frontend and Oracle 8.0 as Backend.

1. Pay roll
2. Mark sheet Processing
3. Savings bank account for banking
4. Inventory system
5. Invoice system
6. Library information system
7. Student information system
8. Income tax processing system
9. Electricity bill preparation system
10. Telephone directory maintenance.

PART – III - ELECTIVE -I

REFER ANNEXURE – I

Part III – VISUAL PROGRAMMING

SUBJECT CODE : 16UBCAE02	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- To introduce knowledge on Visual Basic concepts and Programming.

UNIT I (18hrs)

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String – Numbers.

UNIT II (18hrs)

Displaying Information – Determinate Loops – Indeterminate Loops – Conditionals – Built-in Functions – Functions and Procedures.

UNIT III (18hrs)

Lists – Arrays – Sorting and Searching – Records – Control Arrays – Combo Boxes – Grid Control – Projects with Multiple forms – Do Events and Sub Main – Error Trapping.

UNIT IV (18hrs)

VB Objects – Dialog Boxes – Common Controls – Menus – MDI Forms – Testing, Debugging and Optimization – Working with Graphics.

UNIT V (18hrs)

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

1. PRESCRIBED BOOKS:

- i. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
- ii. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill – 1999

QUESTION PAPER PATTERN:

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	Unit – 5	1	

PART - III – ELECTIVE II

2. E-COMMERCE

SUBJECT CODE : 17UBCAE01	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 75

COURSE OBJECTIVES

- This course gives an exposure to the Electronic Commerce

UNIT-I (15hrs)

Electronic Commerce and Opportunities: Background the Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview: Electronic Data Interchange.

UNIT-II (15hrs)

Approaches to Safe Electronic Commerce. Overview – Secure Transport Protocols – Secure Transaction – Secure Electronic Payment Protocol (SEPP) – Secure Electronic Transaction (SET)

UNIT-III (15hrs)

Certificates for Authentication – Security on Web Servers – Payment Schemes: Internet Monetary Payment and Security Requirements- Payment and purchase order process – Online electronic cash.

UNIT-IV (15hrs)

Internet / Intranet Security Issues and Solutions: The Need for Computer Security – Specific Intruder Approaches – Security Strategies-Security Tools – Encryption – Enterprise Networking and Access to the Internet Antivirus Programs.- Security Teams

UNIT-V (15hrs)

MasterCard/Visa Secure Electronic Transaction: Introduction –Business Requirements – Concepts – payment Processing. E-mail and secure e-mail technologies for Electronic Commerce: Introduction _ The Means of Distribution – A model for Message Handling-MIME, S/MIME, MOSS, MIME and Related Facilities for EDI over the Internet.

1. PRESCRIBED BOOKS:

1. Daniel Minoli & Emma Minoli, “Web Commerce Technology Handbook”. Tata McGraw Hill – 1999.

2. REFERENCE BOOKS:

1. K.Bajaj & D Nag , “E-Commerce”, Tata McGraw Hill – 1999.
2. Mamta Bhusry – “E-Commerce”

PART – IV - VALUE EDUCATION

SUBJECT CODE : 16UVED401	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 2	NO. OF HOURS : 15

COURSE OBJECTIVE:

- Values are socially accepted norms to evaluate objects, persons, and situations that form part and parcel of sociality.
- A value system is a set of consistent values and measures. Knowledge of the values is inculcated through education. It contributes in forming true human being, who is able to face life and make it meaningful. There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values. Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration". "People should be treated with respect and dignity". Values tend to influence attitudes and behavior and help to solve common human problems. Values are related to the norms of a Culture.

UNIT I: (3hrs)

Value Education-Its Purpose and Significance in the present world – Value System – The Role of Culture and Civilization-Holistic Living – Balancing the Outer and Inner – Body, Mind and Intellectual Level- Duties and Responsibilities.

UNIT II: (3hrs)

Salient Values or Life- Truth, Commitment, Honesty and Integrity, Forgiveness and Love, Empathy and Ability to Sacrifice, Care, Unity, and Inclusiveness, Self Esteem and Self Confidence, Punctuality – Time, Task and Resource Management – Problem Solving and Decision Making Skills- Interpersonal and Intra Personal Relationship – Team Work – Positive and Creative Thinking

UNIT III: (3hrs)

Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and Non-Violence – Dr. A P J Kalam's ten points for Enlightened Citizenship – Social Values and welfare of the citizen – The role of media in value building.

UNIT IV: (3hrs)

Environment and Ecological balance – Interdependence of all beings – Living and Non- living. The Binding of Man and Nature – Environment Conservation and Enrichment.

UNIT V : (3hrs)

Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – Untouchability – Female infanticide – Atrocities against Women- How to tackle them.

1. REFERENCE BOOKS:

- i.. M.G.Chitakra: Education and Human Values, A.P.H.Publishing Corporation, New Delhi, 2003

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Essay Answer any 5 out of 10 questions (each in 1200 words)	1-10	20	100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
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	Unit – 4	2	
	Unit – 5	2	

PART – III - CORE – XV
PHP SCRIPTING LANGUAGE

SUBJECT CODE : 17UBCAC15	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 2	NO. OF HOURS : 45

COURSE OBJECTIVE:

- This course introduces the basic concepts of PHP Scripting Language.
- To develop web applications using basic PHP elements such as delimiters, control structures, operators, variables, arrays, and functions.
- To manipulate dates and strings using built-in PHP functions and regular expressions.
- To create dynamic web forms using internet tools such as input, environment, and server variables, HTTP headers, and query strings.
- To read, write, manage, and download files through PHP-based web applications.
- To track user information using cookies and sessions.

UNIT I

(10 hrs)

Introduction to PHP:- Installation of PHP, PHP Configuration in IIS & Apache Web Server and features of PHP, Writing PHP: - How PHP code is parsed, Embedding PHP and HTML, Executing PHP and viewing in Browser, Data types, Operators, PHP variables: Static and Global variables, Comments in PHP

UNIT II

(10 hrs)

Control Structures:- Condition statements, Loops, Exit, Die, Return, Arrays in PHP, Working with Data:- FORM element, INPUT elements, Validating the user input, Passing variables between pages-Passing variables through a GET, POST, REQUEST.

UNIT III

(5 hrs)

Functions:- Built-in functions, String Functions, Math Functions, Array Functions, File Handling Functions, Miscellaneous Functions, User Defined Functions.

UNIT IV

(10 hrs)

Handling sessions and cookies:- Concept of Session, Starting session, Modifying session variables, Unregistering and deleting session variable, Concept of Cookies, Handling of Cookies, How to upload files.

UNIT V

(10 hrs)

Ajax Overview:-Understanding java scripts for AJAX, AJAX web application model, AJAX –PHP framework, Performing AJAX validation, Handling XML data using PHP and AJAX, Connecting database using PHP and AJAX.

1. PRESCRIBED BOOKS:

1. Core PHP Programming by Leon Atkinson : Pearson publishers
2. The complete Reference PHP by Stever Holzner : McGraw Hill
3. PHP – A beginners Guide By: Ashok Appu Publisher: Wiley
4. PHP web services - Wrox publication

QUESTION PAPER PATTERN:

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TOTAL MARKS				100

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	Unit – 4	2	
	Unit – 5	1	
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	Unit – 2	1	
	Unit – 3	1	
	Unit – 4	2	
	Unit - 5	1	

PART – III - CORE – XVI
SOFTWARE ENGINEERING

SUBJECT CODE : 16UBCAC16	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the concepts of Software Engineering and Testing.
- To explain the background of the software crisis and the need for an engineering approach
- To appreciate the distinction between software programming and an engineering approach to the development of a software product
- To create models of software data and processes using object oriented modeling approaches such as the UML
- To describe and evaluate software tools and technology to enhance productivity and quality of software development
- To demonstrate skills of software documentation, quality assurance and evaluation, and testing as part of software development
- To describe development contexts and be able to apply estimation methods for planning these contexts

UNIT I **(18hrs)**

Introduction: Definition of software and software engineering – Software myths –Software Engineering paradigms: Linear Sequential Model & Prototyping Model Software Project Management – Software Metrics – Software Cost Estimation – Software Project Planning.

UNIT II **(18hrs)**

Software Requirement Analysis: Software Risks – Software Configuration Management System Analysis – Modeling the System Architecture – System Specification –Fundamentals of Requirement Analysis – Software Prototyping – Prototyping method Sand tools specification – Software requirements Specifications

UNIT III **(18hrs)**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.

UNIT IV **(18hrs)**

Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase Testing – Scenario Testing – Defect Bash.

UNIT V **(18hrs)**

System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing – Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

1. PRESCRIBED BOOKS:

1. Roger S. Pressman, Software Engineering – A Practitioner's Approach, McGraw Hill, 4th Edition
2. Software Testing Principles and Practices – Srinivasan Desikan & Gopalswamy Ramesh, 2006, Pearson Education.

2. REFERENCE BOOKS:

1. Richard Fairley, Software Engineering – Design Reliability and Management
2. Renu Rajani, Pradeep Oak – “Software Testing - Effective Methods, Tools & Techniques” –Tata McGraw Hill

QUESTION PAPER PATTERN:

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	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
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	Unit – 4	1	
	Unit - 5	1	

PART - III - CORE – XVII

DATA COMMUNICATION AND NETWORKING

SUBJECT CODE : 17UBCAC17	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES:

- This course introduces the basic concepts of Data Communication and Networking.
- To be familiar with various types of computer networks.
- To be exposed to all the network protocols.
- To be familiar with routing algorithm, and network devices.

UNIT I

(15hrs)

Introduction to Data Communication, Network, Protocols & standards and Standards Organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.

UNIT II

(15hrs)

Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.

UNIT III

(20hrs)

Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet - Token Bus - Token Ring - FDDI - IEEE 802.6 - SMDS - Circuit Switching - Packet Switching - Message Switching - Connection Oriented and Connectionless services.

UNIT IV

(20hrs)

History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM - ATM Topology - ATM Protocol.

UNIT V

(20hrs)

Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web.

1. PRESCRIBED BOOKS:

1. Behrouz and Forouzan,2001,Introduction to Data Communication and Networking, 2nd Edition, TMH.

2. REFERENCE BOOKS:

1. Jean Walrand 1998,Communication Networks (A first Course),Second Edition, WCB/McGraw Hill.
2. Behrouz and Forouzan,2006,Data Communication and Networking,3rd Edition, TMH.

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	Unit – 3	1	
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	Unit – 5	1	

PART - III - CORE – XVIII

MINI PROJECT

SUBJECT CODE : 16UBCAC18	PRACTICAL	MARKS : 100
SEMESTER : VI	CREDITS : 4	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course gives procedure and training about project development by using recent trends in Computer Applications.
- Each student will develop and implement an Application Software based on any emerging technologies.
- Students acquire practical knowledge within the chosen area of technology for project development.
- Students will identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.
- Students will work as an individual in development of technical projects.
- Students develop effective communication skills for presentation of project related activities.
- It helps the students to know about modern tools.
- It helps to write effective procedural code to solve small to medium sized projects.
- Project helps to make them Industry ready.
- It helps to know the current scenario happens in Software Company.

PART – III - CORE - XIX

PRACTICAL - PHP LAB

SUBJECT CODE : 17UBCAC19P	PRACTICAL	MARKS : 100
SEMESTER : VI	CREDITS : 2	NO. OF HOURS : 45

COURSE OBJECTIVES:

- This course introduces the basic concepts of PHP Scripting Language.
- To develop web applications using basic PHP elements such as delimiters, control structures, operators, variables, arrays, and functions.
- To debug and improve code for better reusability and scalability.

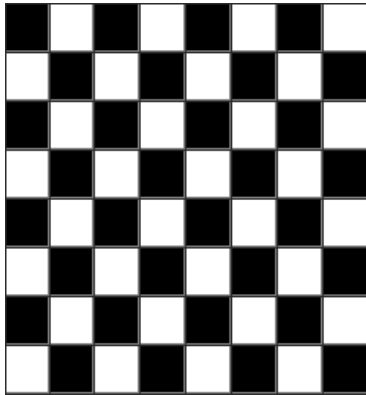
PROGRAMS:

1. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
2. Write a PHP script to count number of lines in a file.
3. Write a PHP function to test whether a number is greater than 30, 20 OR 10 using Ternary operator.
4. Write a PHP program to convert word to digit.
5. Write a PHP program to remove duplicates from a sorted list.
6. Write a PHP program to compute the sum of the digits of a number.
7. Write a function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.
8. Write a PHP function that checks whether a passed string is a palindrome or not?
9. Write a PHP function to change the following array's all values to upper or lower case.
10. Write a PHP function to generate a random password (contains uppercase, lowercase, numeric and other) using shuffle () function.
11. Create a script to construct the following pattern, using a nested for loop.

```
*
 *
 * *
 * * *
 * * * *
 * * * *
 * * *
 * *
 *
 *
```

12. Write a PHP script using nested for loop that creates a chess board as shown below.

13. Use table width="270px" and take 30px as cell height and width.



14. Write a PHP program to check if an integer is the power of another integer.

Input: 16, 2

Example: For x = 16 and y = 2 the answer is "true", and for x = 12 and y = 2 "false"

15. Write the PHP script to get the Client IP Address.

16. Write a PHP script to calculate weeks between two dates.

PART - III – ELECTIVE III

REFER ANNEXURE –I

Part III – CLOUD COMPUTING

SUBJECT CODE : 17UBCAE03	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces the basic concepts of cloud computing.
- To understand the emerging area of "cloud computing" and how it relates to traditional models of computing.
- To gain competence in MapReduce as a programming model for distributed processing of large datasets. Specifically:
 - To understand and be able to articulate key concepts behind MapReduce, including its functional abstraction, the use of distributed storage, and the scheduling of data-local jobs.
 - To understand how well-known algorithms such as PageRank and inverted index construction can be expressed in the MapReduce framework.

UNIT I

(18hrs)

Fundamentals – Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II

(18hrs)

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT III

(16hrs)

Centralizing Email communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV

(20hrs)

Collaborating on Calendars, Schedules and Task Management – Exploring Online scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

UNIT V

(18hrs)

OGSA – Sample Use Cases – OGSA Platform Components – OGSI – OGSA Basic Services. Globus Toolkit – Architecture – Programming Model – High Level Services – OGSI.Net. Middleware Solutions.

1. PRESCRIBED BOOKS:

i. Michael Miller, Cloud Computing : Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

2. REFERENCE BOOKS:

i. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

QUESTION PAPER PATTERN:

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	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit – 5	1	

PART - III – ELECTIVE I

ANNEXURE -I

1. VISUAL PROGRAMMING

SUBJECT CODE : 16UBCAE02	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- To introduce knowledge on Visual Basic concepts and Programming.

UNIT I (18hrs)

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String – Numbers.

UNIT II (18hrs)

Displaying Information – Determinate Loops – Indeterminate Loops – Conditionals – Built-in Functions – Functions and Procedures.

UNIT III (18hrs)

Lists – Arrays – Sorting and Searching – Records – Control Arrays – Combo Boxes – Grid Control – Projects with Multiple forms – Do Events and Sub Main – Error Trapping.

UNIT IV (18hrs)

VB Objects – Dialog Boxes – Common Controls – Menus – MDI Forms – Testing, Debugging and Optimization – Working with Graphics.

UNIT V (18hrs)

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

1. PRESCRIBED BOOKS:

1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill – 1999

PART - III – ELECTIVE I

ANNEXURE -I

2. UNIX PROGRAMMING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces fundamentals & programming of Unix basic concepts

UNIT-I (18hrs)

Introduction: File and Common Commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - The Grep family - Other filters - the stream editor sed - The awk pattern scanning and processing language - Files and good filters.

UNIT-II (20hrs)

Concepts of Shell: Command line Structure - Metacharacters - Creating new commands - Command arguments and parameters - Program output as arguments - Shell variables - More on I/O redirection - Loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, Evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.

UNIT-III (16hrs)

Shell Programming: Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.

UNIT-IV (16hrs)

Features in Unix: Standard Input and Output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - Pick - Interactive file Comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts

UNIT-V (20hrs)

Program Development and Document Preparation: Program development - Four function Calculator - Variables and Error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.

1. PRESCRIBED BOOKS:

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).

2. REFERENCE BOOKS:

1. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd. (1990).
2. Stefen Prata - Advanced UNIX - A Programmer Guide.

PART - III – ELECTIVE I

ANNEXURE -I

3. DATA MINING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces the fundamental concepts of Data Mining.

UNIT-I (16hrs)

Introduction: Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Preprocessing: Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction

UNIT-II (20hrs)

Data Mining, Primitives, Languages and System Architecture: Data Mining – Primitives – Data Mining Query Language,. Architectures of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures.

UNIT-III (18hrs)

Mining Association Rules: Basics Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.

UNIT-IV (18hrs)

Classification and Prediction: Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy.

UNIT-V (18hrs)

Cluster Analysis: Introduction – Types of Data in Cluster Analysis, Partitioning Methods – Hierarchical Methods Density Based Methods – GRID Based Method – Model based Clustering Method.

1. PRESCRIBED BOOKS:

1. J.Han and M. Kamber,2001,Data Mining Concepts and Techniques,Harcourt India Pvt. Ltd - New Delhi.

2. REFERENCE BOOKS:

1. K.P. Soman , Shyam Diwakar, V.Ajay ,2006, Insight into Data Mining Theory and Practice, Prentice Hall of India Pvt. Ltd - New Delhi.

PART - III – ELECTIVE II

1. IDE – PRACTICAL - INTRODUCTION TO WEB DESIGNING(HTML & CSS)

SUBJECT CODE :	PRACTICAL	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 75

COURSE OBJECTIVES:

- The student will be able to define the principle of Web page design, define the basics in web design, visualize the basic concept of HTML, recognize the elements of HTML
- Introduce basic concepts of CSS.

UNIT-I (15hrs)

Web Design Principles - Basic principles involved in developing a web site - Planning process - Five Golden rules of web designing - Designing navigation bar - Page design - Home Page Layout - Design Concept - Basics in Web Design - Brief History of Internet - What is World Wide Web - Why create a web site - Web Standards - Audience requirement.

UNIT-II (15hrs)

Introduction to HTML - HTML Documents - Basic Structure of an HTML document - Creating an HTML document - Mark up Tags - Heading-Paragraphs - Line Breaks - HTML Tags. Elements of HTML - Working with Text, Lists, Tables and Frames - Working with Hyperlinks, Images and Multimedia, Forms and controls. Concept of CSS - Creating Style Sheet - CSS Properties - CSS Styling (Background, Text Format, Controlling Fonts, links).

UNIT-III (15hrs)

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.
3. Write an HTML code to create a Home page having three links: About Us, Our Services and Contact Us. Create separate web pages for the three links.
4. Write an HTML code to create a login form. On submitting the form, the user should get navigated to a profile page.
5. Write an HTML code to create your Institute website (Only Home page).

UNIT-IV (15hrs)

6. Write an HTML code to illustrate the usage of the following:
 - Ordered List
 - Unordered List
 - Definition List
7. Write an HTML code to create a frameset having header, navigation and content sections.
8. Write an HTML code to demonstrate the usage of inline CSS.
9. Write an HTML code to demonstrate the usage of internal CSS.

UNIT-V**(15hrs)**

10. Write an HTML code to demonstrate the usage of external CSS.
11. Write an HTML code to create background image.
12. Write an HTML code to illustrate text formatting.
13. Write an HTML code to illustrate controlling fonts.
14. Write an HTML code to illustrate styling links.

1. PRESCRIBED BOOKS:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. List of Open Source Software/learning website: - Browsers like IE, Mozilla, FireFox etc –
6. Server software XAMPP/WAMP/LAMP –
7. www.apachefriends.org –
8. www.w3.org
9. www.w3schools.com

PART - III – ELECTIVE II

2. E-COMMERCE

SUBJECT CODE : 17UBCAE01	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 75

COURSE OBJECTIVES

- This course gives an exposure to the Electronic Commerce

UNIT-I (15hrs)

Electronic Commerce and Opportunities: Background the Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview: Electronic Data Interchange.

UNIT-II (15hrs)

Approaches to Safe Electronic Commerce. Overview – Secure Transport Protocols – Secure Transaction – Secure Electronic Payment Protocol (SEPP) – Secure Electronic Transaction (SET)

UNIT-III (15hrs)

Certificates for Authentication – Security on Web Servers – Payment Schemes: Internet Monetary Payment and Security Requirements- Payment and purchase order process – Online electronic cash.

UNIT-IV (15hrs)

Internet / Intranet Security Issues and Solutions: The Need for Computer Security – Specific Intruder Approaches – Security Strategies-Security Tools – Encryption – Enterprise Networking and Access to the Internet Antivirus Programs.- Security Teams

UNIT-V (15hrs)

MasterCard/Visa Secure Electronic Transaction: Introduction –Business Requirements – Concepts – payment Processing. E-mail and secure e-mail technologies for Electronic Commerce: Introduction _ The Means of Distribution – A model for Message Handling-MIME, S/MIME, MOSS, MIME and Related Facilities for EDI over the Internet.

1. PRESCRIBED BOOKS:

2. Daniel Minoli & Emma Minoli, “Web Commerce Technology Handbook”. Tata McGraw Hill – 1999.

2. REFERENCE BOOKS:

3. K.Bajaj & D Nag , “E-Commerce”, Tata McGraw Hill – 1999.
4. Mamta Bhusry – “E-Commerce”

PART - III – ELECTIVE II

3. CLIENT / SERVER COMPUTING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : V	CREDITS : 5	NO. OF HOURS : 75

COURSE OBJECTIVES

- This Subject deals with the C/S Computing, GUI.

UNIT-I

(15hrs)

Introduction to Client/Server Computing – What is Client/Server Computing – Benefits of Client/Server Computing – Evolution of C/S Computing – Hardware Trends – Software Trends-Evolution of Operating Systems – N/w Trends – Business Considerations.

UNIT-II

(15hrs)

Overview of C/S Applications: Components of C/S Applications – Classes of C/S Applications – Categories of C/S Applications. Understanding C/S Computing: Dispelling the Myths – Obstacles – Upfront & Hidden – Open Systems & Standards – Standards – Setting Organizations – Factors of Success.

UNIT-III

(15hrs)

The Client Hardware & Software : Client Component – Client Operating Systems – What is GUI – Database Access – Client Software Products : GUI Environments – Converting 3270/5250 Screens – Database Tools – Client Requirements : GUI Design Standards – Open GUI Standards – Interface Independence – Testing Interfaces .

UNIT-IV

(15hrs)

The Server : Categories of Servers – Features of Server Machines – Classes of Server Machines – Server Environment : N/W Management Environment – N/W Computing Environment – Extensions – Network Operating System – Loadable Module.

UNIT-V

(15hrs)

Server Operating System : OS/2 2.0 – Windows New Technology – Unix Based OS – Server Requirements : Platform Independence – Transaction Processing – Connectivity – Intelligent Database – Stored Procedure – Triggers – Load Leveling – Optimizer – Testing and Diagnostic Tools – Backup & Recovery Mechanisms.

1. PRESCRIBED BOOKS:

1. Patrick Smith & Steave Guengerich, “Client/Server Computing”. PHI
2. Dawna Travis Devire, “Client/Server Computing”. TMH

PART - III – ELECTIVE III

1. CLOUD COMPUTING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces the basic concepts of cloud computing.
- To understand the emerging area of "cloud computing" and how it relates to traditional models of computing.
- To gain competence in MapReduce as a programming model for distributed processing of large datasets. Specifically:
 - To understand and be able to articulate key concepts behind MapReduce, including its functional abstraction, the use of distributed storage, and the scheduling of data-local jobs.
 - To understand how well-known algorithms such as PageRank and inverted index construction can be expressed in the MapReduce framework.

UNIT I (18hrs)

Fundamentals – Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II (18hrs)

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT III (16hrs)

Centralizing Email communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV (20hrs)

Collaborating on Calendars, Schedules and Task Management – Exploring Online scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

UNIT V (18hrs)

OGSA – Sample Use Cases – OGSA Platform Components – OGSI – OGSA Basic Services. Globus Toolkit – Architecture – Programming Model – High Level Services – OGSI.Net. Middleware Solutions.

1. PRESCRIBED BOOKS:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

2. REFERENCE BOOKS:

1. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

PART - III – ELECTIVE III

2. SOFTWARE TESTING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces the basic concepts of software testing

UNIT-I (18hrs)

Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.

UNIT-II (18hrs)

Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques

UNIT-III (18hrs)

Data Flow Testing Strategies - Domain Testing: Domains and Paths – Domains and Interface Testing.

UNIT-IV (18hrs)

Linguistic –Metrics – Structural Metric – Path Products and Path Expressions. Syntax Testing – Formats – Test Cases.

UNIT-V (18hrs)

Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.

1. PRESCRIBED BOOKS:

1. B. Beizer , 2003, Software Testing Techniques, II Edn., DreamTech India, New Delhi.
2. K.V.KK. Prasad , 2005, Software Testing Tools, DreamTech. India, New Delhi.

2. REFERENCE BOOKS:

1. Burnstein, 2003, Practical Software Testing, Springer International Edn.
2. E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.

PART - III – ELECTIVE III

3. DISTRIBUTED COMPUTING

SUBJECT CODE :	THEORY	MARKS : 100
SEMESTER : VI	CREDITS : 5	NO. OF HOURS : 90

COURSE OBJECTIVES

- This course introduces the concepts of Distributed databases and Distributed File system and its Hardware concepts.

UNIT-I (18hrs)

Distributed Database – Security and Integrity – New Database application – Design of Databases – Knowledge based Case Studies for Relational Network and hierarchical systems. Distributed processing – Models for distributed computing – Load balancing – Remote procedure calls – Process Migration – Concurrency issues on Databases.

UNIT-II (18hrs)

Hardware concepts – Switched Multiprocessor, Bus based Multicomputer, Switched Multicomputer – Software concepts – Network operating systems and NFS – Time Distributed systems.- Design Issues : Transparency – Flexibility – Reliability – performance and scalability.

Unit-III (18hrs)

Communications in distributed systems – The client – Server model, Blocking vs Unbuffered primitives - Implementation of client-server model.

UNIT-IV (18hrs)

Synchronization in Distributed Systems – Clock synchronization – Mutual exclusion – Election algorithms – Atomic transactions – Deadlocks in Distributed system – Threads – Thread usage and Implementation of thread packages – Processor allocation.

UNIT-V (18hrs)

Distributed File System: File Service Interface – Semantics of the File Sharing – Distributed file system – Implementation of new trends in distributed file systems.

1. PRESCRIBED BOOKS:

1. A.S Tanenbaum, “Modern Operating Systems “ , Pearson Education

2. REFERENCE BOOKS:

1. James Martin, “Computer Networks and Distributed Processing, Software Techniques and Architectures”, Pearson Education.

QUESTION PAPER PATTERN:

Section	Question Component	Numbers	Marks	Total
A	Definition/Principle Answer any 10 out of 12 questions (each in 50 words)	1-12	3	30
B	Short Answer Answer any 5 out of 8 questions (each in 300 words)	13-20	6	30
C	Essay Answer any 4 out of 6 questions (each in 600 words)	21-26	10	40
TOTAL MARKS				100

DISTRIBUTION OF QUESTIONS:

Section	Units	No. of Questions	
		Theory	Problems
A	Unit – 1	2	
	Unit – 2	2	
	Unit – 3	2	
	Unit – 4	3	
	Unit – 5	3	
B	Unit – 1	1	
	Unit – 2	1	
	Unit – 3	2	
	Unit – 4	2	
	Unit – 5	2	
C	Unit – 1	1	
	Unit – 2	2	
	Unit – 3	1	
	Unit – 4	1	
	Unit – 5	1	