SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B' grade by NAAC)

B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

I SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs per Week	Exam (Hrs)	CA	SE	Tot	Crd
1	17UACT11	Part - I	Tamil	6	3	25	75	100	3
	17UACH11		Hindi						
	17UACS11		Sanskrit						
2	17UACE11	Part - II	English	6	3	25	75	100	3
3	17UCSC11	Part-III Core	Programming in C	4	3	25	75	100	4
4	17UCSCP1	Part-III Core	**Lab 1:** Programming in C Lab	5	3	40	60	100	3
5	17UCSA11	Part-III Allied	Discrete Mathematics	4	3	25	75	100	4
6	17UCSS11	Part-IV SBS	Digital Principles& Its applications	3	3	25	75	100	3
7	14UACVE1	Part-IV	Value Education	2	3	25	75	100	2
			Total	30				700	22

Passed in the BOS Meeting held on 15-3-2017

Signature of Chairman/HOD

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	Title : **Programming in C**	Subject Code : **17 UCS C11**
Semester : I	HOURS : 4 hours / Week	CREDITS : 4

Objectives:

- To inculcate knowledge in fundamentals of computers.
- To provide knowledge in algorithm design and flowcharts.
- To make understand the concepts and features of C programming and to enrich the logical skill of the students.

UNIT I : Overview of C: History of C – Importance of C – Basic structure of C – Programming style – Constants, variables and Data types – declaration of variables, storage class – defining symbolic constants – declaring a variable as constant, volatile – overflow and underflow of data. Operators and expressions: arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – arithmetic expression – evaluation of expressions – precedence of arithmetic operators – type conversions in expression – operator precedence and associativity – mathematical functions – managing I/O operations: reading and writing a character – formatted input, output.

UNIT II : Decision making and branching: if statement, if….else statement – nesting of if ….else statement – Else if Ladder – Switch statement – the?: operator – goto statement. The While statement – do statement – The for statement – jumps in loops

UNIT III : Arrays: one dimensional array – declaration, initialisation – two dimensional array – multi dimensional array – dynamic arrays – initialisation. Strings: declaration, initialisation of string variables – reading and writing string – arithmetic operations on strings – putting strings together – comparison – string handling function – table of strings – features of string.

UNIT IV : User defined functions: need – multi function program – elements of user defined function – definition – return values and their types – function calls, declaration, category – all types of arguments and return values – nesting of functions – recursion – passing arrays, strings to functions – scope visibility and life time of variables – multi file programs. Structures and unions: defining a structure – declaring structure variables – accessing structure members – initialisation – copying and comparing – operations on individual members – arrays of structures – arrays within structures – structures within structures – structures and functions – Unions – size of structures – bit fields.

UNIT V : Pointers: accessing the address of a variable – declaring, initialisation of pointer variables – accessing a variable through its pointer – chain of pointers – pointer expressions – pointer increment and scale factors – pointers and arrays – pointers and character strings – array of pointers – pointers as function arguments – function returning pointers – pointers to functions – pointers and structures. Files: defining, opening, closing a file. I/O operations on files – error handling during I/O operations – random access to file – command line arguments.

Text Book:

1. E. Balagurusamy,"Programming in ANSI C",Edition3,Tata McGraw Hill Publishing Company, 2005.

UNIT I : ***Chapters: 1 – 4*** *UNIT II :* ***Chapter 5,6*** *UNIT III :* ***Chapters 7, 8 UNIT IV :*** *Chapters 9, 10* ***UNIT V :*** *Chapter 11, 12*

Reference Book: Programming with C (Schaum's Outline Series), Gottfried, Tata McGraw Hill, 2006.

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PART - III CORE	**Title : PROGRAMMING IN C LAB**	**Subject Code : 17 UCS CP1**
Semester : I	**HOURS : 5 hours / Week**	**CREDITS : 3**

LIST OF EXPERIMENTS

Expression Evaluation

1. Finding Simple Interest and Compound Interest
2. Centigrade to Farenheit and Farenheit to Centigrate
3. Finding roots of a quadratic equation

Conditional Statements

4. EB Bill Generation
5. Print Grade of a student
6. Checking Prime Number

Looping Statements

7. Sum of the digits of a number
8. Evaluate Sine Series
9. Finding Standard Deviation and Variance

Array

9. Searching an element in an array
10. Array Sorting
11. Matrix Addition
12. Matrix Multiplication
13. Finding sum of the diagonal elements of a matrix

String Array

14. Reverse a String and Palindrome Checking
15. Using string built-in functions
16. Finding number of words in a sentence

Functions

17. Finding Factorial
18. Finding NCP value using recursion
19. Finding biggest element

Structures

20. Mark Sheet Preparation using structure
21. Paybill Preparation using structure

Files

22. Inventory Control using files
23. Maintaining Book Information using files

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B.Sc – COMPUTER SCIENCE- SYLLABUS

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PART - III ALLIED	Title : DISCRETE MATHEMATICS	Subject Code : 17 UCS A11
Semester : I	HOURS : 4 hours / Week	CREDITS : 4

Objectives:

- To teach the basic concepts of Set theory and Relations
- To impart knowledge on solving problems using logic
- To solve various problems using matrices.
- To give the basic concepts of Graph theory and its applications

UNIT I

Set Theory: Sets – Notation and Description of sets – Subsets – Venn-Euler diagram – Operations on sets – Properties on Set operations – Verification of the Basic Laws of Algebra by Venn diagrams – The Principle of Duality

Relations : Relations – Representation of a Relation – Operations on Relations –Equivalence Relation .

UNIT II

Matrix Algebra: Introduction – Matrix operations – Inverse of a square matrix – Elementary operations and Rank of a Matrix – Simultaneous equations – Eigen values and Eigen vectors.

UNIT III

Logic: Introduction – TF statements - Connectives – Atomic and Compound statements – Well formed Formulae - The Truth Table of a Formula – Tautological Implications and Equivalence of Formulae implication and equivalence of formulae.

UNIT IV

Graph theory: Introduction – Definition and Examples – Degrees and Subgraphs – Matrices - Connectedness: Walks, Trials and Paths, Connectedness and Components.

UNIT V

Eulerian graphs – Trees**:** Characterization of trees, Centre of a tree.

Text Books:

1. **Discrete Mathematics**, Dr.M.K.Venkaatraman, Dr.N.Sridharan and Dr.N.Chandrasekaran, National Publishing Company, 2000. **(for Units I, II and III)**
2. **Invitation to Graph Theory**, S.Arumugam and S.Ramachandran **,** Scitech Publications, 2005, Chennai. **(for Units IV and V)**

   UNIT I : Chapters1 and 2: Pages: 1.1 – 1.31, 2.6-2.27

   UNIT II : Chapter 6: Pages: 6.1- 6.31, 6.37-6.44

   UNIT III : Chapter 9: Pages: 9.1-9.34

   UNIT IV : Chapters 2.1, 2.2, 2.3, 2.8, 4.0, 4.1, 4.2

   UNIT V : Chapters 5 and 6

Reference Books:

1. **Modern Algebra,** S. Arumugam & A. Thangapandi Issac, Scitech publications, 2005

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - IV SKILL BASED	**Title : DIGITAL PRINCIPLES AND ITS APPLICATIONS**	**Subject Code : 17 UCS S11**
Semester : I	**HOURS : 3 hours / Week**	**CREDITS : 3**

Objectives:

- To give knowledge about Binary, Octal, Decimal, Hexadecimal number system
- To inculcate knowledge on logic gates and Boolean algebra
- To give knowledge on the physical components of computers like Registers, Multiplexers, Decoders, Flipflops, and counters

UNIT I:

Binary number system-Binary to Decimal conversions-Decimal to Binary-Octal-Hexadecimal numbers-ASCII code-Excess-3 code-Gray code-The basic gates- Inverter-OR Gates-AND Gates-Universal logic gates-NOR Gates-NAND Gates

UNIT II:

Boolean laws and theorems-Sum of Products Method-K map-Truth Tables-Pairs, Quads, Octets-K map simplifications-Don't care conditions-Product of sum methods-Product of sum simplifications.

UNIT III:

Multiplexers-De-Multiplexers-1-of-16-Decoders-BCD-to-Decimal Decoders- 7-segment decoders-Encoders-Exclusive-OR Gates-Parity Generators-Checkers

UNIT IV:

Binary Addition-Binary Subtraction-2's & 1's complement representation-2'sComplement Arithmetic-Arithmetic building blocks-RS-flip flop-D-Flip Flop-JK Flip Flop- JK Master Slave Flip Flop.

UNIT V:

Types of Registers-Serial in Serial out-Serial in Parallel out-Parallel in Serial out-Parallel in parallel out-Ripple Counter-Synchronous Counter.

Text Book:

Digital Principles and Applications by Albert Paul Malvino and Donald P.Leach
Sixth Edition Tata McGraw-Hill-Edition

UNIT I : Chapters: 2.1 to 2.3, 5.1 to 5.8
UNIT II : Chapters: 3.1 to 3.8
UNIT III: Chapters: 4.1 to 4.8
UNIT IV: Chapters: 6.1 to 6.8, 8.1, 8.3, 8.4, 8.5, 8.7
UNIT V : Chapters: 9.1 to 9.5, 10.1, 10.3

Reference Books:

1. Digital Computer Fundamentals ,Thomas C.Bartee TMH 2007.
2. Digital Circuits and Design,S.Salivahanan and S.Arivazhagan ,Vikas Publishers.2005

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

II SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs/ Week	Exam Hrs	CA	SE	Tot	Crd
1	17UACT21	Part - I	Tamil	6	3	25	75	100	3
	17UACH21		Hindi						
	17UACS21		Sanskrit						
2	17UACE21	Part - II	English	6	3	25	75	100	3
3	17 UCSC21	Part-III Core	Object oriented programming using C++	4	3	25	75	100	4
4	17UCSCP2	Part-III Core	**Lab 2:** OOP using C++ Lab	5	3	40	60	100	3
5	17 UCS A21	Part-III Allied	Probability and Statistics	4	3	25	75	100	4
6	17 UCS S21	Part-IV SBS	Computer Organization	3	3	25	75	100	3
7	14UACES1	Part-IV	Environmental Studies	2	3	25	75	100	2
			Total	30				700	22

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	**Title : OBJECT ORIENTED PROGRAMMING USING C++**	**Subject Code : 17 UCS C21**
Semester : II	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To inculcate knowledge in object oriented programming concepts.
- To enrich the knowledge in inheritance and virtual functions
- To give knowledge on file handling

UNIT I:

Principles of object oriented programming(OOP**):**Software evolution – OOP Paradigm – Basic concepts of OOP – Benefits of OOP – Object Oriented Languages – Applications of OOP. Introduction to C++: Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++.

UNIT II:

Function in C++ - Main Function – Function Prototyping – Call by reference – Return by reference – Function Overloading – Friend and Virtual Functions.

UNIT III: Classes and objects-Constructors and Destructors – Operator overloading.

UNIT IV: Inheritance – Single inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance– Hybrid inheritance. Pointers,Virtual Functions and Polymorphism-Managing I/O Operations.

UNIT V: Working with Files : Classes for File Stream Operations – Opening and Closing a File – End-of-file deletion – File pointers – Updating a File – Error Handling during File Operations Command line Arguments.

Text Book:

E. Balagurusamy, Object Oriented Programming With C++, 4th Edition, Tata McGraw-Hill, New Delhi, 2008

Chapters:

Unit I :	Chapter 1 – 3		
Unit II:	Chapter 4	Unit IV:	Chapters 8-10
Unit III:	Chapter 5- 7	Unit V:	Chapters 11

Reference Books:

1. Object-Oriented Programming With C++, Poornachandra Sarang, 2nd Edition, PHI Learning Private Limited, New Delhi, 2009
2. Object-Oriented Programming Using C++, Alok Kumar Jagadev, Amiya Kumar Rath and Satchidananda Dehuri, Prentice-Hall of India Private Limited, New Delhi, 2007
3. Al Stevens, C++ Programming , 7Th Edition, Wiley DreamTech India Pvt Ltd , 2003
4. Classical Data Structures – D.Samanta, PHI, 2008

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	**Title : OBJECT ORIENTED PROGRAMMING USING C++ LAB**	**Subject Code : 17 UCS CP2**
Semester : II	**HOURS : 5 hours / Week**	**CREDITS : 3**

LIST OF EXPERIMENTS

Write programs in C++ to solve the following Problems:

1. To perform Area calculation using Function overloading (Min three functions).
2. To perform String manipulation (three different types) using function overloading.
3. To swap two values between two class objects using friend function.
4. To find minimum of two numbers between two class objects using friend function.
5. To overload unary minus operator which changes sign of given vector (3 elements)
6. To overload Binary + operator which adds two complex numbers.
7. To process students mark list using multiple inheritance
8. To Process employee details using hierarchical inheritance
9. To process family details using hybrid inheritance.
10. To process electricity billing using binary file.
11. To process mark listing using binary file.
12. To perform stack operations.
13. To perform queue operations.
14. To manipulate singly linked list

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B.Sc – COMPUTER SCIENCE- SYLLABUS

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PART - III ALLIED	**Title : PROBABILITY AND STATISTICS**	**Subject Code : 17 UCS A21**
Semester : II	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To give knowledge about various types of statistical measures such as mean, median, mode, geometric mean, harmonic mean, standard deviation etc.,
- To give a foundation in statistical data analysis
- To solve real life problems using Correlation coefficient, regression, and theoretical probability distributions.

UNIT –I : CENTRAL TENDENCIES: Intorduction –Arithmetic Mean (AM) – Partition values (Median, Quartiles, Deciles and Percentiles) – Geometric Mean and Harmonic Mean – Relative advantages of different averages.

UNIT – II : MEASURES OF DISPERSION: Introduction – Measures of Dispersion - Measures of dispersion – Range – Quartile Deviation – Mean Deviation – Standard deviation and Root mean square deviation – Coefficient of dispersion - Coefficient of variation – relative advantages of different measures of dispersion - Moments – Skewness – Kurtosis

UNIT – III : CURVE FITTING: Introduction – Principle of Least squares - Fitting of a straight line - Fitting of second degree parabola. **CORRELATION AND REGRESSION:** Introduction – Correlation - Karl Pearson coefficient of correlation – Rank Correlation – Repeated ranks – Regression – Lines of regression

UNIT – IV : PROBABILITY: Introduction - Probability – Conditional Probability - Example Problems only. **RANDOM VARIABLES**: Introduction - Random Variables – Discrete Random variable - Continuous random variable – Mathematical Expectations – Solved Problems only.

UNIT –V : SOME SPECIAL DISTRIBUTIONS: Introduction - Binomial distribution – Moments of Binomial distribution – MGF of Binomial distributions - Poisson distribution – MGF of Poisson distributions - Moments of Poisson distribution - Normal distribution – Moments of Normal distribution - MGF of Normal distributions.

(**Excluding the Topics**: Median, Mode, Cumulants, Recurrence formula, Fitting distributions, Characteristic functions, Additive Property)

(**Units I,II,III,IV,V: Problems** – Solved Problems only, **Theorems**- Statements only)

TEXT BOOK:

STATISTICS, By "**Dr.S.ARUMUGAM & A.THANGAPANDI ISSAC**", NEW GAMMA PUBLISHING HOUSE,2002

Unit I : 2.0 – 2.5 : Pages: 11-59 Unit II : 3.0-3.2, 4.0-4.2 : Pages: 60-94

Unit III: 5.0, 5.1, 6.0, 6.1, 6.2, 6.3 : Pages :95-141

Unit IV: 11.0, 11.1 , 11.2, 12.0, 12.1, 12.2, 12.3, 12.4 : Pages: 274-300, 304-328

Unit V: 13.0, 13.1, 13.2, 13.3

REFERENCE BOOKS:

1. **FUNDAMENTALS OF MATHEMATICAL STATISTICS** by **S.C.GUPTA & V.K.KAPOOR,** SULTAN CHAND AND SONS, 2004.
2. **ELEMENTS OF MATHEMATICAL STATISTICS** by S.C.GUPTA & V.K.KAPOOR, SULTAN CHAND & SONS, THIRD EDITION, 2000

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - IV SKILL BASED	**Title : COMPUTER ORGANIZATION**	**Subject Code : 17 UCS S21**
Semester : II	**HOURS : 3 hours / Week**	**CREDITS : 3**

Objectives:

- To enrich the knowledge on hardware components of a computer
- To have knowledge on Instruction formats and addressing modes
- To inculcate knowledge on working concepts of Input/output devices.
- To give knowledge on various types of memory and their hierarchies.

Unit I Instruction Codes _ Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle.

Unit II General Register Organization – Stack Organization – Instruction Formats – Addressing Modes.

Unit III Parallel processing-Pipelining-Arithmetic and Instruction puipeline-Vector processing-Vector operation-memory interleaving- Super Computer.

Unit IV I/O Interface – Asynchronous Data Transfer- Modes of I/O transfer - Direct Memory Access.

Unit V Memory Hierarchy – Main Memory - Auxillary Memory – Associative Memory – Cache Memory – Virtual Memory.

Text Book:

Computer System Architecture – M. Morris Mano 3rd Edition

Unit I	Chapters:	5.1 - 5.5
Unit II	Chapters:	8.1 - 8.5
Unit III	Chapters:	9.1 - 9.4, 9.6
Unit IV	Chapters:	11.2 - 11.4, 11.6
Unit V	Chapters:	12.1 - 12.6

Reference Books:

Computer Organization V. Carl Hamacher, Zconko G. Vranesic, Safwat G. Zaky 4th Edition, McGraw-Hill International Editions.

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

III SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs/ Week	Exam Hrs	CA	SE	Tot	Crd
1	17UACT31/ H31/ S31	Part - I	Tamil/Hindi /Sanskrit	6	3	25	75	100	3
2	17 UACE31	Part - II	English	6	3	25	75	100	3
3	17 UCSC31	Part-III Core	JAVA Programming	4	3	25	75	100	4
4	17 UCS CP3	Part-III Core	**Lab 3:** JAVA Programming Lab	5	3	40	60	100	3
5	17 UCSA31	Part-III Allied	Operations Research	4	3	25	75	100	4
6	17 UCS SP1	Part-IV SBS	**Lab 4:** Linux and shell programming Lab	3	3	40	60	100	3
7	17 UCSN31	Part-IV NME	Introduction to Computers and Office Automation	2	3	25	75	100	2
			Total	**30**				**700**	**22**

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	**Title : JAVA PROGRAMMING**	**Subject Code : 17 UCS C31**
Semester : III	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To give knowledge about OOP concepts using JAVA language
- To make understand the features of JAVA as a Platform independent Language
- To train the students by solving various problems using JAVA

UNIT 1 : Creation of Java – Why Java is Important to the Internet – Java's Byte Code – Java's Buzzwords -OOP's Principles – Compiling the program – Lexical Issues – Simple Data Types – Literals – Variables – Type Conversion and Casting – Operators – Control Statements – Selection Statements – Iterative Statements – Jump Statements

UNIT 2 : Class – Objects – Methods – Constructors – this keyword – Garbage Collection – finalize – Overloading Methods – Overloading Construtors – Recursion – Access Control – static – final – nested and Inner Classes – String Class – using Command Line Arguments – StringBuffer Class

UNIT 3 : Inheritance – Using Super – Method Overriding – dynamic method dispatch – using Abstract Classes – using final to prevent overriding – using final to prevent inheritance – Packages and Interfaces – Simple Wrapper Classes

UNIT 4 : Exceptions Hansling – try – catch – finally – throw – throws – Java's Built in exceptions – user defined exceptions – Java's Thread Model – Thread Class – Creating Thread – Java I/O classes - Serialization

UNIT 5 : Applet Basics- Architecture – Skeleton – Applet Class – Html's applet tag – passing parameters to applets – Event Handling – Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Adapter Classess – AWT Controls

TEXT BOOK :
The Complete Reference – Java2 – 3rd Edition – Patrick Naughton and Herbert Schildt, Tata Mc Graw Hill
UNIT 1 : Chapters 1,2,3,4,5
UNIT 2 : Chapters 6,7,13
UNIT 3 : Chapters 8,9,14
UNIT 4 : Chapters 10,11,17
UNIT 5 : Chapters 19,20,22

REFERENCE BOOKS

1.Programming with Java, A primer, 3e, E.Balagurusamy, TMH Co. 2008.
2. Java and Object-Oriented Programming Paradigm, Debasish Jana, Prentice-Hall of India Private Limited, New Delhi, 2008.

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PART - III CORE	Title : JAVA PROGRAMMING LAB	Subject Code : 17 UCS CP3
Semester : III	HOURS : 5 hours / Week	CREDITS : 3

Simple Java Programs

1. Generate Fibonacci Series
2. Implementing Bitwise Logical AND,OR,NOT,XOR Operator
3. Display EB Bill Amount using Switch Statement
4. Array – Searching and Array – Sorting
5. Matrix – RowSum, Column Sum
6. Pattern Display using break and continue
7. Finding Factorial using Recursion

Using Classes and Objects

8. Volume of a box using simple class
9. Employee Details using array of objects
10. Student information using Constructor Overloading
11. Finding area using Method Overloading
12. Single Inheritance
13. Adding int, float numbers using Method Overriding

String and StringBuffer

14. String Handling Methods & StringBuffer Class Methods

Package and Interfaces

15. Arithmetic Calculation using packages
16. Banking Operations using Interface

Exceptions

17. Built in exceptions handling & User Defined Exceptions handling

Thread

18. Thread Handling

I/O

19. File Handling
20. Using CharacterArray Reader
21. Using Wrapper Classes

Applets and AWT Controls

22. Mouse Event Handling
23. Keyboard Event Handling
24. Passing Parameters to Applets
25. Draw a toy
26. Create a Login Page
27. Display Registration Form
28. Display Order Form

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B.Sc – COMPUTER SCIENCE- SYLLABUS

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PART - III ALLIED	**Title : OPERATIONS RESEARCH**	**Subject Code : 17 UCS A31**
Semester : III	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To solve Assignment problems and Transportation problems using OR techniques
- To solve LPP using Graphical, Simplex, Big-M methods
- To impart knowledge on Characteristics and Techniques of OR

UNIT I:

Development of OR – Definition of OR – Modeling – Characteristics & Phases – tools, techniques & methods – Scope of OR.

UNIT II:

Linear Programming Problem – Formulation – Slack & Surplus variables – Graphical solution of LPP.

UNIT III:

Simplex method – Computational procedure – Artificial variables techniques – Big M Method.

UNIT IV:

Mathematical formulation of assignment problem – Methods for solving the assignment problems.

UNIT V:

Mathematical formulation of transportation problem – Methods for solving the transportation problem.

Text Book:

Operation Research, S. D. Sharma, Kedar Nath Ram Nath & Co, 2004

Reference Books:

1. Operations Research, Man Mohan Gupta and Gandhi Swarup, Sultan Chand Publications.
2. Problems and Solutions in Operation Research, Man Mohan Gupta and Gandhi Swarup, Sultan Chand Publications

UNIT I : Chapter 1 (1.1, 1.2, 1.4, 1.5, 1.8, 1.9, 1.10, 1.11)
UNIT II : Chapter 3 (3.1, 3.2, 3.3, 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.4, 3.5)
UNIT III : Chapter 5 (5.1, 5.2, 5.2.1, 5.3, 5.4, 5.5, 5.5.1, 5.5.2, 5.5.3, 5.5.4)
UNIT IV : Chapter 11 (11.2, 11.3 and 11.4)
UNIT V : Chapter 12 (12.2 to 12.8)

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B.Sc – COMPUTER SCIENCE- SYLLABUS

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PART - IV **SKILL BASED**	**Title : LINUX AND SHELL PROGRAMMING LAB**	**Subject Code : 17 UCS SP1**
Semester : III	**HOURS : 3 hours / Week**	**CREDITS : 3**

LIST OF EXPERIMENTS

1. Find the sum of the digits of a given number
2. Find the reverse of a number
3. Perform basic arithmetic operations using case
4. Display multiplication table
5. Check whether a number is prime or not using while
6. Convert lowercase to uppercase using tr statement
7. Check for an adam number
8. Check pattern matching using grep
9. Find the number of users who have logged in
10. Check for palindrome
11. Find age of a person using set date
12. Write a menu driven program to display today's date,
    Processes of the system, user's of the system, list files of the system
13. Read 10 names from a file and sort in
    a. Ascending order b. Descending order
14. Write a menu driven program to check for file existence, file readable or not,
    file writeable or not,
15. Get mark details of a student and display total and grade
16. Prepare electricity bill
17. To set the attributes of a given file
18. Check the given file is a directory or not
19. To create and append a file
20. To compare two files
21. To perform string manipulation

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - IV **NME**	**Title : INTRODUCTION TO COMPUTERS AND OFFICE AUTOMATIONS**	**Subject Code : 17 UCS N31**
Semester : III	**HOURS : 2 hours / Week**	**CREDITS : 2**

Objectives:

- To create an awareness about fundamentals of computers to Non-Comp.Sc. students
- To give knowledge about document handling using MS-WORD, creating worksheets and graphs using MS-EXCEL
- To impart knowledge on Slide presentation using MS-POWER POINT

UNIT I: Computer Fundamentals: History, Generations - Classification of Computers –Windows Operating System
Introduction to Microsoft Office 2000 – Microsoft Word Screen – File Menu – Edit Menu – View Menu –Insert Menu – Format Menu.

UNIT II: Tools Menu – Table Menu – Window Menu – Help Menu – Formatting the Text –Alignment of Text – Applying Fonts – Size of Text – Font of the Text – Colour of the Text.

UNIT III: Spreadsheets & Microsoft Excel: Understanding Microsoft Excel for Windows –Starting Microsoft Excel 2000 – Understanding Spreadsheets – File Menu – Edit Menu – Insert Menu – Data Menu – Window Menu.

UNIT IV: Creating a Worksheet in Excel for Windows – Copying Formula –Functions in Excel – Using Autosum – Using autocalculate – References – Sum Function – Average Function – Creating Charts in Excel –Creating Graphs .

UNIT V: Power Point – How to create a new power point presentation – Adding a new slide – Insert Table, picture, clip art, shapes, chart, header, footer, Word Art / Date & Time, Slide – Slide Layout.

Text Book:

Learning computer Fundamentals, MS Office and Internet & Web Technology - Dinesh Maidasani – FIREWALL MEDIA, First Edition 2005.

Reference Book:

A Beginners Guide to Computers – Alexis Leon & Mathews Leon-Vikas Publishing House Pvt Ltd.

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

IV SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs/ Week	Exam Hrs	CA	SE	Tot	Crd
1	17 UAC T41/ H41/S41	Part - I	Tamil/Hindi/Sanskrit	6	3	25	75	100	3
2	17 UAC E41	Part - II	English	6	3	25	75	100	3
3	17 UCS C41	Part-III Core	Data Structures and Algorithms	4	3	25	75	100	4
4	17 UCS CP4	Part-III Core	**Lab 5:** Visual Programming lab	5	3	40	60	100	3
5	17 UCS A41	Part-III Allied	Numerical Methods	4	3	25	75	100	4
6	17 UCS S41	Part-IV SBS	Quantitative Aptitude	3	3	25	75	100	3
7	17 UCS N41	Part-IV NME	Introduction to Internet	2	3	25	75	100	2
8		Part-V	Extension Activities	-				100	1
			Total	**30**				**800**	**23**

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(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III **CORE**	**Title : DATA STRUCTURES AND ALGORITHMS**	**Subject Code : 17 UCS C41**
Semester : IV	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To give knowledge on the concepts and applications of (i) linear data structures viz., arrays, stacks, queues (ii) linked linear data structures viz., linked lists, linked stacks and linked queues and (iii) Non-linear data structures viz.,trees, binary trees
- To give knowledge on various sorting and searching algorithms
- To impart knowledge on solving problems using algorithmic techniques viz., Divide and Conquer, Greedy Approach, Dynamic Programming and Backtracking

Unit I:

Introduction to Data Structures: Introduction – Linear arrays- Representation of linear arrays in memory- Bubble sort- Linear search- Multimensional arrays.

Introduction – Linked Lists- Representation of ;linked lists in memory- insertion into a linked list- deletion from a linked lists.

Unit II:

Introduction –Stack — Array representation of Stack- Linked representation of Stack- Arithmetic expressions; Polish Notation – Recursion – Recursion –Towers of Hanoi.

Unit III:

Trees – Introduction – Binary Trees– Representation of Binary Trees in memorys – Traversing binary trees- Traversal algorithms using stack – Sorting – Insertion sort- Selection Sort – Merge Sort.

UNIT IV:

Algorithms: Importance of developing efficient algorithms – Analysis – Order - Divide and conquer: Binary search – Merge sort – Quick sort - Dynamic Programming: Binomial coefficients – Floyds algorithm for shortest paths – chained matrix multiplication

UNIT V:

Greedy Approach: Minimum spanning trees – Dijkstra's algorithm for single source shortest path.

Backtracking: The Backtracking techniques – The n- Queens Problem –The Sum of Subsets problems - Graph Colouring .

Text Books:

1. Data Structures – Seymour Lipschutz- Tata MCGraw hill – year 2006.
2. Foundations of Algorithms Using C++ Pseudocode, Third edition, Richard Neapolitan, Kumarss Naimipour.Narosa publication, 2004.

Reference Books:

1. Classical Data Structures – D.Samanta, PHI, 2008
2. Fundamentals of computer algorithms, Ellis Horowitz and sartaj sahni, Galgotia book house.

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PART - III CORE	**Title : VISUAL PROGRAMMING LAB**	**Subject Code : 17 UCS CP4**
Semester : IV	**HOURS : 5 hours / Week**	**CREDITS : 3**

1. To check whether a given number is
   a. Prime or not
   b. Armstrong or not
2. Program to perform
   a. Reverse the string
   b. Length of the string
3. Program to find
   a. Current date & time
   b. Day of the given date
4. To generate fibonacci series using recursion
5. To find the value of ncr using function
6. To print multiplication table
7. Creation of arithmetic calculator
8. Preparation of questionnaire
9. Program to draw geometric shapes
10. Program to create a mousedown event
11. Program to create color mixture using scroll bar control
12. Program to change text attributes
13. Program using common dialog control to open a file & save a file
14. Program using timer control to animate an object
15. Program to create a file open dialog to load a picture
16. Program to design analog clock
17. Program to prepare eb bill using msflexgrid control
18. Program using text box to validate its content
19. Program to create a menu with simple file & edit options
20. Program for sequential file writing & reading
21. Processing Of Telephone Bill Using Data Control.
22. Processing Of Student Mark List Using Data Control.
23. Processing Of Employee Paybill Using Ado Control.
24. Creation Of A Simple Address Book Using Ado Control.
25. Creation Of Student Information System Using Dao Control.
26. Program Using Activex Control.

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(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III ALLIED	**Title : NUMERICAL METHODS**	**Subject Code : 17 UCS A41**
Semester : IV	**HOURS : 4 hours / Week**	**CREDITS : 4**

Objectives:

- To give knowledge on solving algebraic & Transcendental equations using various methods
- To impart knowledge on solving simultaneous equations using various methods
- To practice students on solving problems using Interpolation, Numerical differentiation, Numerical Integration and Numerical differential equations

UNIT I:

Errors in computer Arithmetic – Algebraic and Transcendental Equations: Iteration method – Bisection method – Regula Falsi method – Newton Raphson method.

UNIT II:

Simultaneous Equations: Gauss elimination method –Gauss Jordan, Gauss Seidel iteration methods.

UNIT III:

Interpolation: Newton's interpolation formulae – Central difference interpolation formulae – Lagrange's interpolation formula – Inverse interpolation.

UNIT IV:

Numerical differentiation: Newton's Forward and Backward difference formulae – Numerical Integration: Trapezoidal rule – Simpson's rule. Eigen values and Eigen vectors of a matrix.

UNIT V:

Numerical solution of differential equations: Euler's method – Taylor's series method – Range – Kutta methods.

Text book:

Numerical Methods, T. Veerarajan and T. Ramachandran, 2nd edition, Tata McGraw Hill, 2006

Reference Books:

1. Numerical Methods by S. Arumugam & A. Thangapandi Issac, A. Somasundaram, Sci Tech Publication, Chennai, 2002.
2. Introductory Methods of Numerical Analysis, S.S.Sastry, Prentice Hall of India Pvt.Ltd, New Delhi, 4th Edition, 2008.
3. Computer – Oriented Numerical Methods, P.Thangaraj, Prentice Hall of India Pvt.Ltd, New Delhi, 2008

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PART - IV **SKILL BASED**	**Title : QUANTITATIVE APTITUDE**	**Subject Code : 17 UCS S41**
Semester : IV	**HOURS : 3 hours / Week**	**CREDITS : 3**

Objectives:

- To give numerical aptitude and to prepare students for competitive examinations
- To impart knowledge on solving various types of numerical problems
- To practice students by giving variety of problems and enrich their analytical skills

UNIT I:

Numbers – HCF & LCM of numbers – Decimal Fractions.

UNIT II:

Square roots & Cube roots – Average – Problems on Numbers – Problems on Ages.

UNIT III:

Percentage – Profit & Loss – Ratio & Proportion.

UNIT IV:

Time & Work – Time & Distance.

UNIT V:

Simple Interest – Compound Interest – Area –Volume & Surface areas.

Text Book

Quantitative Aptitude, R.S.Aggarwal, Reprint 2007, S.Chand & Company Ltd,

Unit I : Chapters: 1,2,3
Unit II : Chapters: 5,6,7,8
Unit III : Chapters: 10,11,12
Unit IV : Chapters: 15,17
Unit V : Chapters: 21,22,24,25

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PART - IV **NME**	**Title : INTRODUCTION TO INTERNET**	**Subject Code : 17 UCS N41**
Semester : IV	**HOURS : 2 hours / Week**	**CREDITS : 2**

Objectives:

- To teach the basic concepts of Internet.
- To teach various HTML tags for creating web pages
- To test students creativity by giving real life problems in web page design

UNIT I:

Introduction - Internet – History – How the Web Works – Web Server and Clients – Connections – ISDN – Dialup or leased – DNS – Registering – Intranet – Overview of Web Browsers.

UNIT II:

HTML – Basic Components of HTML - Formatting - URL – PROTOCOL – Server Name - Linking to other HTML Documents – Linking Inside the same document – FTP – GOPHER – FTP Commands.

UNIT III:

Lists – Ordered lists – Unordered lists – Directory lists – Definition lists – Combining List types – Graphics and Web pages

UNIT IV:

Image Formats – Graphics In HTML – Images and Hyper link anchors – Image Maps.

Tables –Frames In HTML – Frame set Container.

UNIT V

HTML Forms – Input tag – Form elements – Background graphics and color – MS Internet – Extensions – Font Tag – Scrolling Marquees - Introduction to social network – Face book , Twitter, Whatsapp, Viber – Introduction to E-shopping.

TEXT BOOK:

Computer Fundamentals and Windows with Internet Technology. By N.KRISHNAN, PUBLISHER SCITECH

REFERENCE BOOKS:

1. The Internet Book, Douglas E.Comer Fourth Edition, PHI Learning Pvt.Ltd, New Delhi-2009.

2. Using the Internet the easy way, Young Kai Seng Minerva Publications, First Edition, 2000.

3. www.Wikipedia.Com , www.W3Schools.Com, www.webopedia.com

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V SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs per Week	Exam Hrs	CA	SE	Tot	Crd
1	17UCSC51	Part-III Core	Relational Database Management System	5	3	25	75	100	4
2	17UCSC52	Part-III Core	Operating System Concepts	5	3	25	75	100	5
3	17UCSC53	Part-III Core	Software Engineering Concepts	5	3	25	75	100	5
4	17UCS CP5	Part-III Core	**Lab 6** : MYSQL & PHP Lab	5	3	40	60	100	3
5	17UCS CP6	Part-III Core	**Lab 7 :** Web Design Lab (HTML / DHTML / JAVA,VB Script / XML)	5	3	40	60	100	3
6	17UCSE51*	Part-III Elective	Advanced Java Programming	5	3	25	75	100	5
	17UCSE52*		Mobile Computing						
	17UCSE53*		Web Technology						
7	16USS S51		Soft Skills	-	-	-	-	100	-
			Total	**30**				**700**	**25**

***One elective to be selected from 17UCSE51,E52,E53.**

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(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	**Title : RELATIONAL DATABASE MANAGEMENT SYSTEM**	**Subject Code : 17 UCS C51**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 4**

Objectives:

- To give knowledge about the basic concepts of Database management systems
- To make understand the need of normalization using various normal forms
- To give knowledge about SQL and on-line Transaction processing

UNIT I:

Introduction to Database Systems: Purpose of a Database System, Database Systems versus File Systems – View of Data – Data Models – Database Languages – Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

Entity – Relationship Model: Basic Concepts – Mapping Constraints – Keys – Design Issues – Entity Relationship Diagram – Weak Entity Sets – Design of an E-R Database Schema – Reduction of an E-R Schema to Tables.

UNIT II:

Relational Model: Structure of Relational Databases – The Relational Algebra – Extended. Relational Algebra Operations – Modification of the Database – Views – The Tuple Relational Calculus, The Domain Relational Calculus.

UNIT III:

SQL: Basic Structure – Set Operations – Aggregate functions – Nested Queries – Derived Relations – Views – Modification of the database – Data Definition Language – Embedded SQL – Other SQL Features.

UNIT IV:

Relational Database Design: First Normal Form – Pitfalls in Relational Database Design – Normalization Using Functional Dependencies – Decomposition – Desirable properties of decomposition Normalization using Multivalued Dependencies.

UNIT V:

Transaction concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions – Recoverability Concurrency control – Lock –Based Protocols – Timestamp – based Protocols – Validation based Protocols.

TEXT BOOK:

A. Silberschatz, H.Korth and S.Sudarsan, Database System Concepts, TATA McGraw Hill Inc., 2002, Fourth Edition.

UNIT I : Chapter 1.1 to 1.9 and Chapter 2.1, 2.3 to 2.9, 2.9.1
UNIT II : Chapter 3.1 to 3.4
UNIT III : Chapter 4.2 , 4.3 , 4.4 , 4.6 , 4.9
UNIT IV : Chapter 7.1 to 7.4
UNIT V : Chapter 13.1to 13.4,13.6,14.1 to 14.3

REFERENCE BOOKS:

1. Bipin. C. Desai, An Introduction to Database System, West Publishing Company, 2004.
2. C. J. Date, An Introduction to Database Systems, Addition – Wesley, 2007, Eighth Edition.

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B.Sc – COMPUTER SCIENCE- SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

PART - III CORE	**Title : OPERATING SYSTEM CONCEPTS**	**Subject Code : 17 UCS C52**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge on the various concepts of Operating systems
- To impart knowledge on Deadlock, Processor scheduling, Memory management and disk scheduling
- To introduce the basic concepts of Android operating system

UNIT I: Introduction to Operating Systems: Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture. Process Concepts: Introduction, Process States, Process Management, Interrupts, Interprocess Communication.

UNIT II: Asynchronous Concurrent Execution: Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software solutions to the Mutual Exclusion Problem,Hardware solution to the Mutual Exclusion Problem,Semaphores. Concurrent Programming: Introduction Monitors.

UNIT III: Deadlock and Indefinite Postponement: Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra's Banker's algorithm, Deadlock Detection, Deadlock Recovery.

Processor Scheduling: Introduction, Scheduling levels, Preemptive Vs Non-Preemptive Scheduling Priorities, Scheduling objective, Scheduling criteria, Scheduling algorithms.

UNIT IV: Real Memory Organization and Management: Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous Vs Non – Contiguous Memory allocation, Fixed Partition Multiprogrammimg, Variable Partition multiprogramming.

Virtual Memory Management: Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.

UNIT V: Disk Performance Optimization: Introduction, Why Disk Scheduling is necessary, Disk Scheduling strategies, Rotational optimization.

File and Database Systems: Introduction, Data Hierarchy, Files, File Systems, File Organization.

Basics of Android: Introduction to Android – What is Android- Android Platform – Components – Applications – Components life cycle – Life cycle states – Life cycle events – Application life time – Life cycle method

TEXT BOOK:

Operating Systems by DeitelDeitelChoffnes – Pearson education Third edition

UNIT I: Chapter 1: 1.1,1.2,1.12,1.13,Chapter 3: 3.1,3.2,3.3,3.4,3.5

UNIT II: Chapter 5: 5.1, 5.2, 5.3, 5.4 (upto5.4.2), 5.5, 5.6, Chapter 6: 6.1, 6.2

UNIT III: Chapter 7: 7.1,7.2,7.3,7.4,7.5,7.6,7.7,7.8,7.9,7.10, Chapter 8: 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7

UNIT IV: Chapter 9: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.8, 9.9, Chapter 11: 11.1, 11.5, 11.6, 11.8, 11.9, 11.10

UNIT V: Chapter 12: 12.1, 12.4, 12.5, 12.6 Chapter 13: 13.1, 13.2, 13.3, 13.4, 13.5

REFERENCE BOOK:

An introduction to Operating systems concepts and Practice by Pramod Chandra P.Bhatt – PHI 2nd Edition

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PART - III CORE	Title : SOFTWARE ENGINEERING CONCEPTS	Subject Code : 17 UCS C53
Semester : V	HOURS : 5 hours / Week	CREDITS : 5

Objectives:

- To impart knowledge on systematic way of software development and Maintenance
- To give knowledge about the important activities of the various phases of Software life cycle
- To introduce the basic concepts of Software project Management

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

UNIT II: Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing – Level Estimation – Estimating Software Maintenance Costs.

UNIT III: Software Requirements Definitions: The Software Requirements Specification – Formal Specification Techniques – Relational Notations – State-Oriented notations – Languages and Processors for Requirements Specification - PSL/PSA – SSA – GIST.

UNIT IV: Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real – Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections – Design Guidelines.

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

UNIT V: Software Maintenance: Enhancing Maintainability During Development – Managerial Aspects of Software Maintenance – Configuration Management – Source – Code Metrics

Introduction to Software Project Management (SPM): Introduction – What is a project – Software projects Vs Other types of project – Activities covered by SPM – Some ways of categorizing software projects – The project as a system – What is Management? – Problems with software projects – Management control – Stakeholders

TEXT BOOKS:

1. SOFTWARE ENGINEERING CONCEPTS – RICHARD E.FAIRLEY – Tata McGraw - Hill Publishing Company Limited, New Delhi 1997.
2. SOFTWARE PROJECT MANAGEMENT – MIKE COTTERELL andBOB HUGHES, International Thomson Publishing

Text Book:1	**Text Book:2**
Unit – I : 1.1 – 1.4, 2.1-2.5 Unit – II : 3.1 - 3.4 Unit – III : 4.1, 4.2, 4.3.1, 4.3.4, 4.3.5 Unit – IV : 5.1 – 5.9, 8.1, 8.5, 8.6 Unit – V : 9.1 – 9.4	Unit V – Ch. 1

REFERENCE BOOKS:

1. SOFTWARE ENGINEERING – K.L.JAMES, Prentice Hall of India Pvt. Ltd., New Delhi – 2009.
2. SOFTWARE ENGINEERING by PRESSMAN.

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PART - III CORE	**Title : MYSQL & PHP LAB**	**Subject Code : 17 UCS CP5**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 3**

LIST OF EXPERIMENTS

1. **MYSQL – DDL commands**
2. **MYSQL – DML/TCL commands**
3. **MYSQL – Table Handling Queries**
4. **PHP programs based on Decision Making with Branching**
5. **PHP programs based on Decision Making with Looping**
6. **PHP programs using Functions**
7. **PHP programs using Arrays & Strings**
8. **PHP programs using Forms (Eg. Login Screen, Registration form,etc.,)**
9. **PHP programs using GET & POST method**
10. **PHP program for student result generation using MYSQL**
11. **PHP program for EB bill generation using MYSQL**
12. **PHP program for Employee pay bill generation using MYSQL**

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PART - III CORE	**Title : WEB DESIGN LAB**	**Subject Code : 17 UCS CP6**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 3**

HTML:

1. Display your own Resume.
2. Display Your Department timetable and Syllabus using Internal & External Links.
3. Display Your College Website.
4. Display Railway Reservation From.
5. Display Designing an Advertisement.

JAVA SCIRPT:

6. Login ID Validation
7. Handling Mouse Events
8. Creating Cookies
9. Background Color Changing
10. Evaluate an Expression.

VB SCRIPT

11. Performing Arithmetic Operation.
12. Performing String Operation.
13. EB Bill Calculation.
14. Cinema Ticket Booking.

DHTML

15. Display Various Fonts Using DHTML.
16. Display Text Mirror, Vertical, Horizontal using DHTML.
17. Display paragraph using DHTML.
18. Display Student ID Card using XML

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PART - III ELECTIVE	**Title : ADVANCED JAVA PROGRAMMING**	**Subject Code : 17 UCS E51**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge on the various concepts of Advanced Java viz., Applets, Event handling, Event Listener Interfaces, AWT controls, Swing and RMI

UNIT I:

Packages – Defining a Package – Example – Access Protection – Importing Packages – Interfaces – Defining an interface – Implementing interface – variables in interfaces – variables in interfaces – Example.

Exception Handling – Fundamentals – Exception types – using try and catch – multiple catch – throw – throw – finally –built in exception – creating your own exceptions.

UNIT II:

Applet – Basics – Architecture – Skeleton- Overriding update () – display methods – repaint () – html applet tag – passing pameters to applet – get document base – get code base ().

Event handling – event delegation model – events – event sources – event listeners – event classes-action event class – adjustment event class –component event class – container event class – focus event class – input event class – item event class – key event class – mouse event class – text event class – window event class.

UNIT III:

Event Listener Interfaces – Action Listener Interface – Adjustment Listener Interface – Component Listener Interface – Container Listener Interface – Focus Listener Interface – Item Listener Interface – Key Listener Interface – Mouse Listener Interface – Mouse Motion Listener Interface – Text Listener Interface – Windows focus Listener Interface

AWT classes – windows – frame window – working with graphics – working with color – working with fonts.

UNIT IV:

AWT Controls – Buttons – check box- check box group – choice – list – scroll bar – text field – text area. Layout managers – flow layout – border layout – grid layout – card layout – menu boar – menu – file – dialog Image file format – creating an image – loading – displaying.

UNIT V:

Swing – Japplet – Icons – Labels – Textfields – button – jbutton – checkbox – radio – combo box – tabbed panes – scroll pane –trees – table.

RMI – Client/server Application using RMI – Java Beans – Advantages – using BDK – JAR files – Introspection –Developing simple bean using BDK – Bean properties – Bean Info interface – Constrained property – persistence – customizers.

TEXT BOOK:

The Complete Reference – Java 2 – V Edition – Herbert Schildt – Tata McGraw Hill Edition.

Unit I : Chapters 9,10 - Unit II : Chapters 19,20 - Unit III : Chapters 20,21

Unit IV : Chapters 22,23 - Unit V : Chapters 26,25,24

REFERENCE BOOK:

Java and Object – Oriented Programming Paradigm, Debasish Jana, Prentice – Hall of India Private Limited, New Delhi, 2008.

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PART - III ELECTIVE	Title : MOBILE COMPUTING	Subject Code : 17 UCS E52
Semester : V	HOURS : 5 hours / Week	CREDITS : 5

Objectives:

- To understand the functions of Mobile devices
- To learn about WAP Architecture
- To learn about the functions of embedded systems

Unit I

Information Access Devices – Handheld Computers – Palm OS – Based Devices – Windows CE – Based Handheld Computers – EPOC Based Handheld Computers – Sub notebooks – Phones – Cellular Phones – Data transmission capabilities – Smart Phones –Screen phones.

Unit II

Smart Identification-Smart cards – smart labels – smart Tokens – **Embedded Controls**- Smart sensors and Actuators – Smart Appliances – Appliances and home networking –Automotive computing.

Unit III

Internet Protocols and Formats – HTTP- HTML-XML-Xforms-**Mobile Internet**-WAP 1.1 Architecture –Wireless Application Environment 1.1 –WAP 2.0 Architecture –i-node.

Unit IV

Voice –Voice Technology Trends –Voice on the web – Standardization.

Unit V

Connectivity - Wireless Wide Area Networks – Short Range Wireless Communication.

Text Book:

Principles of Mobile Computing –Uwe Hansmann, Lother Merk, Martin S.Nicklous, Thomas Stober – Springer – Second Edition – 2003.

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PART - III ELECTIVE	**Title : WEB TECHNOLOGY**	**Subject Code : 17 UCS E53**
Semester : V	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge on web page designing using HTML
- To impart knowledge on the various concepts of JAVASCRIPT, VBSCRIPT and SERVLETS
- To inculcate knowledge on JSP

UNIT I:

Introduction – History of the Internet – Services and Accessibility – uses, Protocols, Web Concepts – Internet Standards. HTML – Introduction – SGML – HTML document – Head section – Body section – HTML Forms.

UNIT II:

JAVASCRIPT – Introduction – Language Elements-Identifiers- Expressions – keywords – operators – statements – conditional statements – looping statements – break- continue – functions – Objects of JavaScript - window object – document object – forms – textbox – textarea – buttons – radiobutton – checkbox – select – Other Objects –Date object – String Object – Math Object - Arrays.

UNIT III:

VBSCRIPT – Introduction – Embedding VBScript Code in an HTML Document – Comments-Variables – Operators – Procedures – Conditional Statements – Looping constructs – Objects and VBScript – Cookies.

UNIT IV:

SERVLETS – Introduction – Advantages of Servlets over CGI – Installing Servlets – The Servlet Life Cycle – Servlet API – A Simple Servlet – Handling HTTP GET Requests – Handling HTTP POST Requests – Cookies – Session Tracking – Multi-tier Applications Using Database Connectivity – Servlet Chaining.

UNIT V:

JAVA SERVER PAGES (JSP) – Introduction – Advantages of JSP – Developing First JSP – Components of JSP – Reading Request Information – Retrieving the Data Posted from a HTML File to a JSP File – JSP Sessions – Cookies – Disabling Sessions.

Text Book:

1. **Web Technology – A Developer's Perspective** ,N.P.Gopalan and J.Akilandeswari, Prentice-Hall of India Pvt. Ltd, New Delhi, 2008.

   UNIT I : Chapters 1 and 4 UNIT II : Chapter 5
   UNIT III : Chapter 6 UNIT IV : Chapter 10
   UNIT V : Chapter 11

Reference Books :

1. Mastering Javascript, J.Jaworski, BPB Publications, 1999.
2. Java Servlet Programming, Jason Hunter, 2nd Edition, 2001, Shroff Publishers, New DelhI.
3. Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl, CGI - I.Bayross, BPB Publications, 2000.

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VI SEMESTER

Sl. No.	Subject Code	Nature	Subject Title	Hrs per Week	Exam (Hrs)	CA	SE	Tot	Crd
1	17UCSC61	Part-III Core	Data Mining and its Applications	5	3	25	75	100	5
2	17UCSC62	Part-III Core	Computer Graphics	5	3	25	75	100	5
3	17UCS CP7	Part-III Core	**Lab 8 :** PYTHON PROGRAMMING LAB	5	3	40	60	100	3
4	17UCS CP8	Part-III Core	**Lab 9** : Advanced Visual Programming Lab	5	3	40	60	100	3
5	17UCSE61	Part-III Elective	Multimedia Technology and Applications	5	3	25	75	100	5
	17UCSE62		Software Testing						
	17UCSE63		Data Communication and Computer Network						
6	17UCSEV1	Part-III Elective	Project & Viva-Voce	5	3	40	60	100	5
7	16UGK B61		General Knowledge	-	-	-	-	100	-
			Total	**30**				**700**	**26**

***One elective to be selected from 17UCSE61,E62,E63.**

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PART - III CORE	**Title : DATA MINING AND ITS APPLICATIONS**	**Subject Code : 17 UCS C61**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge in Data Mining and Data Warehousing
- To inculcate knowledge on Association Rule mining, Clustering and Classification techniques
- To learn various applications of data mining techniques

UNIT I: Introduction: What motivated data mining? Why it is important? – What is data mining? - Data mining – on what kind of data? – Relational databases – Data Warehouses – Transactional databases – Advanced data and Information systems and Advanced Applications – Data mining Functionalities – What kind of patterns can be mined?: Concept/Class Description: Characterization and Discrimination – Mining Frequent Paterns, Associations, and Correlations – Classification and Prediction – Cluster Analysis – Outlier Analysis – Evolution Analysis – Classification of Data mining systems.

UNIT II: Mining frequent patterns , Associations and Correlations : Basic concepts and Road Maps – Market Basket Analysis: A motivating example – Frequent itemsets, Closed itemsets, and Association Rules – Frequent pattern mining: A Road Map – Efficient and scalable frequent itemset mining methods – The Apriori algorithm – Generating association rules from frequent itemsets – Improving the efficiency of Apriori – Mining frequent itemsets without candidate generation

UNIT III: Classification and Prediction: What is classification? What is prediction? – Issues regarding classification and predictions: Preparing the data for classification and prediction – Comparing classification and prediction methods – Classification by decision tree induction: Decision tree induction – Attribute selection measures – Tree pruning – Scalability and decision tree induction – Bayesian classification: Bayes theorem – Naïve Baysian classification

UNIT IV: Cluster analysis : What is cluster analysis – Types of data in cluster analysis: Interval – Scled variables – Binary Variables – Categorical, Ordinal and Ratio-Scaled variables – Variables of mixed types – Vector objects - A categorization of Major clustering methods – Partitioning methods: Classical partitioning methods : k-Means and k-Medoids

UNIT – V: Applications and Trends in Data mining – Data mining applications: Data Mining for Financial data analysis – Data Mining for the Retail Industry – Data Mining for the Telecommunication industry – Data Mining for Biological data analysis – Data Mining in other scientific applications – Data Mining for Intrusion Detection – Trends in Data Mining.

TEXT BOOK:

" **Data Mining – Concepts and Techniques** " by Jiawei Han and Micheline Kamber, Second Edition, Morgan Kaufmann Publishers, 2006

Unit I: Chapter:1 Unit IV: Chapter:7 Unit II: Chapter:5

Unit III: Chapter:6 Unit V: Chapter:11

REFERENCE BOOKS:

1. "Principles of Data Mining" by D.Hand, H.Mannila and P.Smyth, Second Edition, PHI Pvt.Ltd., New Delhi, 2006
2. "Data Mining: Introduction and Advanced Topics" by M.H.Dunham, Second Edition, Pearson Education Pvt. Ltd., New Delhi, 2004

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PART - III CORE	**Title : COMPUTER GRAPHICS**	**Subject Code : 17 UCS C62**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge about various display devices, input devices on Graphic systems
- To impart knowledge on various algorithms for line drawing, circle generating, ellipse generating, polygon filling, and clipping
- To make understand two-dimensional transformations like scaling, rotation, translation, etc., and Window-to-Viewport coordinate transformation.

UNIT I:

A survey of computer graphics: Computer-Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces. **Overview of Graphics Systems:** Video Display Devices – Raster Scan Systems – Random Scan Systems – Input Devices – Hard Copy Devices.

UNIT II:

Output Primitives: Points and Lines – Line Drawing Algorithms – Circle Generating Algorithms – Ellipse Generating Algorithms – Filled Area primitives.

UNIT III:

Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Gray Scale Levels – Area Fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions – Antialiasing.

UNIT IV:

Two – Dimensional Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations – Transformations Between Coordinate Systems.

UNIT V:

Two – Dimensional Viewing: The Viewing Pipeline – Viewing Coordinate Reference Frame – Window –to- Viewport Coordinate Transformation – Two-Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

Text Book

COMPUTER GRAPHICS – DONALD HEARN , M.PAULINE BAKER
Prentice Hall of India Pvt. Ltd., New Delhi ,SECOND EDITION, 1994

Chapters

Unit – I : 1.1 – 1.8, 2.1-2.3, 2.5, 2.6 Unit – II : 3.1, 3.2, 3.5-3.7, 3.11
Unit – III : 4.1 – 4.8 Unit – IV : 5.1 – 5.5
Unit – V : 6.1 – 6.11

Reference Books:

1. COMPUTER GRAPHICS, MULTIMEDIA and ANIMATION – MALAY K.PAKHIRA, Prentice Hall of India Pvt. Ltd., New Delhi – 2008
2. FUNDAMENTALS OF COMPUTER GRAPHICS and MULTIMEDIA – D.P.MUKHERJEE, Prentice Hall of India Pvt. Ltd., New Delhi – 1999

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PART - III CORE	**Title : PYTHON PROGRAMMING LAB**	**Subject Code : 17 UCS CP7**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 3**

LIST OF EXPERIMENTS

1. Write a Python program to compute addition of two numbers.
2. Write a Python program to finding Total, Average and grade system of Student Marks.
3. Write a Python program to calculate Area and Circumference of a Circle.
4. Write a Python program to compute Temperature Conversion.
5. Write a Python program to calculate of Simple Interest (SI).
6. Write a Python program to check whether the number is Positive Number or Negative Nos.
7. Write a Python program to check whether the year is Leap Year or Not.
8. Write a Python program to calculate greatest of three numbers.
9. Write a Python program to check whether the number is Prime Number or Not.
10. Write a Python program to check whether the number is ODD or EVEN Number.
11. Write a Python program to Swapping of two numbers without using temporary variable.
12. Write a Python program to print the Fibonacci series using recursion.
13. Write a Python program to calculate Factorial of a given number using recursion function.
14. Write a Python program to calculate sum of digits of a given number using function.
15. Write a Python program to reverse the given input number using function.
16. Write a Python program to check whether the number is Palindrome Number or Not.
17. Write a Python program to check whether the number is Armstrong Number or Not.
18. Write a Python program to find the minimum and maximum of a list of numbers.
19. Write a Python program: "tuple1 = (10,50,20,40,30)"
    i. To display the elements 10 and 50 from tuple1
    ii. To display length of a tuple1.
    iii. To find the minimum element from tuple1.
    iv. To add all elements in the tuple1. v. To display same tuple1 multiple times.
20. Write a Python program.
    i. To calculate the length of a string.
    ii. To reverse words in a string.
    iii. To display same string multiple times.
    iv. To concatenate two strings.
    v. Str1= "South India" , using string slicing to display "India"
21. Data analytics using PYTHON

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PART - III CORE	**Title : ADVANCED VISUAL PROGRAMMING LAB**	**Subject Code : 17 UCS CP8**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 3**

1. Write a program in VB.Net to perform String Operations.
2. Write a program in VB.Net to perform Listbox Operations.
3. Write a program in VB.Net to perform Array List Operations.
4. Write a program in VB.Net to perform Binary Search.
5. Write a program in VB.Net to demonstrate Constructor Overloading.
6. Write a program in VB.Net to draw Shapes using Enumeration.
7. Develop a VB.Net application using Datagrid to display records.
8. Write a program in VB.Net to perform Number Checking.

(Armstrong, Adam, Palindrome, Sum of Digits)

9. Write a program in VB.Net to design a Calculator.
10. Write a program in VB.Net to perform Bank Transaction using Constructor.
11. Develop a VB.Net Quiz application.
12. Write a program in VB.Net to display Student Mark List Using Exception.
13. Write a program in VB.Net to show Car Show Room Details using Property.
14. Develop a VB.Net application for Hospital Management using Interface.
15. Write a program in VB.Net to perform Payroll Calculation of Employees using Inheritance.
16. Write a program in VB.Net to implement Operator Overloading.
17. Develop a database application to perform insert, modify, update and delete operations.

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PART - III ELECTIVE	**Title : MULTIMEDIA TECHNOLOGY AND APPLICATIONS**	**Subject Code : 17 UCS E61**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give knowledge on multimedia concepts viz., Text, Audio, Video, Images and Graphics
- To impart knowledge on Digital Audio and Digital Video systems
- To inculcate knowledge on multimedia tools and its usage on internet

Unit-I:

Introduction : Brief History of Multimedia - What is Multimedia? -The Multimedia Market – Production and evaluation:Types of Products – Evaluation - Computer Architecture - Operating Systems and Software - Multimedia Computer Architecture - Software Executables and Libraries - Software Drivers

Unit-II:

Text: Elements of Text - Text Data Files -Using Text in Multimedia Applications –Hypertext – Graphics: Element of Graphics -Images and Color - Graphics File and Application Formats - Obtaining Images for Multimedia Use- Using a Graphics in Multimedia Applications

Unit-III:

Digital Audio: Characteristics of Sound and Digital Audio - Digital Audio Systems – MIDI - Audio File Formats - Using Audio in Multimedia Applications

Unit-IV:

Digital video and Animation: Background on Video - Characteristics of Digital Video - Digital Video Data Sizing - Video Capture and Playback Systems - Computer Animation

Unit-V:

Authoring Tools: Multimedia Tool Selection - Multimedia Tool Features - Categories of Authoring Tools – Multimedia and Internet - HTML and Web Authoring - Multimedia Considerations for the Internet.

Text Book:

Multimedia Technology and Applications – David Hillman published by Suneel Galgotia publications Pvt Ltd

UNIT I: Chapters 1,2,3
UNIT II: Chapters 4,5
UNIT III: Chapters 6
UNIT IV: Chapters 7
UNIT V: Chapters 9,10

Reference Books:

1. Tay Vaughan , Multimedia making it work, V edition TMH ,New Delhi

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2. Ranjan Parekh , Principles of Multimedia , TMH

PART - III ELECTIVE	Title : SOFTWARE TESTING	Subject Code : 17 UCS E62
Semester : VI	HOURS : 5 hours / Week	CREDITS : 5

OBJECTIVES:

1. To make understand Basic Testing Concepts
2. To give knowledge on Various Testing strategies
3. To inculcate knowledge on the Execution and Reporting

UNIT I: Software Development Life Cycle models:

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

UNIT II: 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 f Testing – Scenario Testing – Defect Bash.

UNIT III: System and Acceptance Testing:

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

UNIT IV: Performance Testing:

Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT V: Test Planning, Management, Execution and Reporting:

Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

TEXT BOOK:

1. **SOFTWARE TESTING Principles and Practices – Srinivasan Desikan & Gopalswamy Ramesh,** 2006, Pearson Education.

(UNIT-I: 2.1-2.5, 3.1-3.4 UNIT-II: 4.1-4.4, 5.1-5.5 UNIT III: 6 .1-6.7
(UNIT IV: 7.1-7.6, 8.1-8.5 UNIT-V: 15.1-15.6, 17.4-17.7)

REFERENCE BOOKS:

1. EFFECTIVE METHODS OF SOFTWARE TESTING–William E.Perry, 3rd ed, Wiley India.
2.SOFTWARE TESTING – Renu Rajani, Pradeep Oak, 2007, TMH.

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PART - III ELECTIVE	**Title : DATA COMMUNICATION AND NETWORKS**	**Subject Code : 17 UCS E63**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To teach various types of networking technology
- To impart knowledge on various issues of the different layers of OSI
- To introduce the basic concepts of Cryptography

UNIT 1 : **Introduction** – A Brief History – Applications – Computer Networks – Topology – Categories of Networks – Standards and Standards Organisations – Network Architecture- OSI Model - TCP/IP Architecture

Communication Media and Data Transmission – Analog and Digital Data Transmission – Modulation and DeModulation - Transmission Media –Twisted Pair- Baseband , Broadband Co-axial Cable – Optical Fibre – Wireless Communication – Radio waves – Microwaves – Infrared

UNIT 2 : Error Detection and Correction – Types of Errors – Error Detection – Parity Check – Redundancy Check – Check Sum – Error Corrections

Data Link Control And Protocol Concepts – Flow Control – Stop and Wait Flow Control – Sliding Window Flow Control – Error Control – Synchronous Protocols

Local Area Network - LAN Transmission Equipment – NIC – Bridge – Router – Brouter – Switches – Gateways – Ethernet IEE 802.3 – Pure Aloha – Slotted Aloha – CSMA – CSMA/CD

UNIT 3 : Internetworking - Principles of internetworking – routing Principles – Centralized Routing – Distributed Routing – Dijikstra Algorithm – Internetwork Protocol – IP Services – Datagram Protocol Function – Internet Control Message Protocol

UNIt 4 : TCP Reliable Transport Service - Transport Protocols – Services TCP provides to Applications – End to End Services and Datagram – Transmission Control Protocol - User Datagram Protocol

Network Applications - Client-Server Model – Domain Naming Systems - TELNET – File Transfer and Remote File Access – FTP – TFTP – Electronic Mail – World Wide Web - URL

UNIT 5 : Network Security - Fundamental Concepts – Identification and Authentication – A Model for Network Security – Malicious Software – Security Services and Cryptography – Crypto Systems – Symmetric Cryptosystems – Asymmetric Crypto Systems – Security Services – Hash function, Message Digest , Digital Signatures, digital Certificates – Securing Network using Firewall – Types of Firewalls – Web Security – Intrusion Detection

Text BooK : - Data Communication and Computer Networks by Brijendra Singh,
PHI Learning Private Limited, New Delhi, 2009, II Edition

UNIT 1 : Chapter 1, Chapter 2.2-2.7
UNIT 2 : Chapter 3. Chapter 5.1, 5.2, 5.3, Chapter 6.2, 6.4
UNIT 3 : 10.1, 10.2, 10.3
UNIT 4 : Chapter 11, 12
UNIT 5 : Chapter 14

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PART - III ELECTIVE	**Title : PROJECT & VIVA-VOCE**	**Subject Code : 17 UCS EV1**
Semester : VI	**HOURS : 5 hours / Week**	**CREDITS : 5**

Objectives:

- To give exposure on software development and maintenance
- To train students, a systematic way of Report writing
- To practice students for project presentation

1. A maximum of two students can join to do the project work
2. Students must undertake the project work under the guidance of a faculty member
3. Progressive reports have to be submitted to the guide periodically
4. The internal test marks is 40 and is divided into the following components.

    (i) Two Presentations - 2 X 10 = 20 marks

    (ii) Progressive Reports - 10 marks

    (iii) Internal Viva-voce - 10 marks

5. The external examination will be jointly conducted by both the Internal and external examiners
6. The students must submit 3 copies (2 copies for 2 students + 1 copy for the Dept.) of their Project Report two weeks before the external examination.
7. The maximum marks for the external examination is 60 and it may be divided into the following components.

    (i) Project Report - 20 marks

    (ii) Project Presentation - 20 marks

    (iii) Project viva-voce - 20 marks