APPENDIX – J

MADURAI KAMARAJ UNIVERSITY
(University with Potential for Excellence)

Revised Syllabus for
Bachelor of Computer Applications (B.C.A.)
(CBCS - Semester Pattern)
This will be effective from the academic year 2016-17

REGULATIONS:

1. **Course Objective:**

   To prepare the students to manage the software components in a computer independently and to be a Programmer. To motivate the students to take up higher studies in Computer Applications and other streams.

2. **Eligibility for Admission:**

   A Candidate should have studied +2 Mathematics with Physics/Commerce/ Economics in the 10 +2 stream.

3. **Duration of the Course:**

   The students shall undergo the prescribed course of study for a period of not less than three academic year (Six semesters).

4. **Medium of Instruction :** English
5. **Subjects/ Structure of Course Study :** See Appendix – CA1
6. **Scheme of Examinations/ Structure of Question Paper:** : See Appendix - CA2
7. **Detailed Syllabus:** See Appendix – CA3
8. **Eligibility for the Degree:**

   i)   A Candidate shall be eligible for the award of the degree on completion of the prescribed course of study and passing all the prescribed external examinations

   ii)   Attendance progress, internal examinations, conduct certificate from the Head of the Institution shall be required for taking the external examination.

   iii)   The passing minimum and the ranking are as per the existing rule of the Choice Based Credit System for the affiliated college of the University.

Appendix – CAI

(Subject/Structure of Course Study)

Sem.	Subjects							Total Hours	Total Credits
I	T1(6) [3]	E1(6) [3]	CS1(4) [4]	CS2(6) [4]	AS1(4) [4]	SBS1(2) [2]	NME1(2) [2]	30	22
II	T2(6) [3]	E2(6) [3]	CS3(4) [4]	CS4(6) [4]	AS2(4) [4]	SBS2(2) [2]	NME1(2) [2]	30	22
III	T3(6) [3]	E3(6) [3]	CS5(4) [4]	CS6(4) [3]	CS7(4) [4]	AS3(4) [4]	SBS3(2) [2]	30	23
IV	T4(6) [3]	E4(6) [3]	CS8(4) [4]	CS9(4) [3]	CS10(4) [4]	AS4(4) [4]	SBS4(2) [2]	30	23
V	CS11(5) [4]	CS12(5) [4]	CS13(5) [4]	CS14(6) [4]	ES1(5) [4]	EVS(2) [2]	SBS5(2) [2]	30	24
VI	CS15(5) [4]	CS16(6) [4]	CS17(5) [4]	ES2(5) [4]	ES3(5) [5]	VE(2) [2]	SBS6(2) [2]	30	25
							Extension Activities		1
							TOTAL CREDITS		140

Abbreviations:

( )	–	Number of Hours	[ ]	–	Number of Credits
T	-	Tamil;	E	-	English
CS	-	Core Subject	AS	-	Allied Subject
SBS	-	Skill Based Subject	NME	-	Non Major Elective
ES	-	Elective Subject	VE	-	Value Education
EVS	-	Environmental Studies	EA	-	Extension Activity

I SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	T1	Tamil	6	3	25	75
2	E1	English	6	3	25	75
3	CS1	Programming in C	4	4	25	75
4	CS2	**Lab 1** : Programming in C	6	4	40	60
5	AS1	Discrete Mathematics	4	4	25	75
6	SBS1	**Lab 2** : Office Automation Lab	2	2	40	60
7	NME1	Office Automation	2	2	25	75
		Total	30	22		

II SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	T2	Tamil	6	3	25	75
2	E2	English	6	3	25	75
3	CS3	Object Oriented Programming with C++	4	4	25	75
4	CS4	**Lab 3:** Object Oriented Programming with C++	6	4	40	60
5	AS2	Resource Management Techniques	4	4	25	75
6	SBS2	**Lab 4** : Linux programming	2	2	40	60
7	NME2	Introduction to HTML	2	2	25	75
		Total	30	22		

III SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	T3	Tamil	6	3	25	75
2	E3	English	6	3	25	75
3	CS5	Java Programming	4	4	25	75
4	CS6	**Lab 5**: Java Programming	4	3	40	60
5	CS7	Digital Principles and Computer organization	4	4	25	75
6	AS3	Computer Based Financial Accounting	4	4	25	75
7	SBS3	**Lab 6**: Business Accounting	2	2	40	60
		Total	30	23		

IV SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	T4	Tamil	6	3	25	75
2	E4	English	6	3	25	75
3	CS8	Data Structures and Computer Algorithms	4	4	25	75
4	CS9	**Lab 7**: Data Structures and Computer Algorithms	4	3	40	60
5	CS10	Computer Graphics	4	4	25	75
6	AS4	Principles of Costing	4	4	25	75
7	SBS4	**Lab 8**: Multimedia	2	2	40	60
8	EA	Extension Activities		1	100	
		Total	30	24		

V SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	CS11	Relational Database Management Systems	5	4	25	75
2	CS12	Data Communication and Computer Networks	5	4	25	75
3	CS13	Operating System	5	4	25	75
4	CS14	**Lab 9** - Relational Database Management Systems	6	4	40	60
5	ES1	1. Mobile Computing 2. Web Technology 3. Information Security	5	4	25	75
6	EVS	Environmental Studies	2	2	25	75
7	SBS5	**Lab 10** : Networking	2	2	40	60
		Total	30	24		

VI SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	CS15	Dot Net Programming	5	4	25	75
2	CS16	**Lab 11** : Dot Net Programming	6	4	40	60
3	CS 17	Software Engineering	5	4	25	75
4	ES2	1. Data Mining 2. Compiler design 3. Cryptography & Network Security	5	4	25	75
5	ES3	Project Work / Viva-Voce	5	5	25	75
6	VE	Value Education	2	2	25	75
7	SBS6	Quantitative Aptitude	2	2	25	75
		Total	30	25		

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Non-Major Elective Courses to be offered by the Department of Computer Applications

    NME1 – Office Automation

    NME2 – Introduction to HTML

Appendix – CA2

Scheme of Examination /Question Paper Pattern
Scheme of Evaluation

For Theory Subjects:

Question Paper Pattern:

Time: 3 Hours	**Max. Marks: 75**

Part – A
Answer all the questions   **(10*1=10)**

Ten Questions, two questions from every unit: *Multiple Choice Questions.*

Part – B
Answer all the questions   **(5*7=35)**

Five Questions, one question set from every unit: *Either ...Or... type*

Part – C
Answer any three questions   **(3*10=30)**

Five Questions, one question from every unit

A candidate has to prepare Algorithm / Procedure for both the questions covering both the parts. The following list of parameters taken into account for the evaluation of practical examination.

Total Marks: 100 (Internal: 40 marks.   External: 60 Marks)

For Practical Subjects:

Parameters:

For Internal Marks:

i.	Average of two tests:	25
ii.	Record Work:	10
iii.	Seminar / Quiz / Viva:	5
	Total:	**40**

For External Marks

i.	Aim, Procedure / Algorithm and Program:	15
ii.	Coding and Compilation :	10
iii.	Debugging :	15
iv.	Results :	10
v.	Viva:	10
	Total	**60**

Note: The External Examiner can fix other exercises also other than those found in the list (Syllabus) consultation with the Internal Examiner without violating the scope of the prescribed syllabus.

For Project Work:

The combined project shall be undertaken by the students as a team of two.

Total Marks: 100 (Internal: 25 marks,   External: 75 Marks)

Parameters:

For Internal Marks: Two review meetings : 2 X 7.5 = 15 Marks

Overall Performance   :   = 10 Marks

For External Marks: Project Report   :   − 25 Marks

Project demo & Presentation :   = 30 Marks

Viva-Voce   :   − 20 Marks

Appendix – CA3
(Detailed Syllabus)
I Semester
CS1: Programming in C
(6 Hours - 4 Credits)

Unit I

Overview of C: History of C – Importance of C – Basic Structure of C Programs – Programming Style – Character Set – C Tokens – Keywords and Identifiers – Constants, Variables and Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data – Operators and Expressions: Arithmetic, relational, logical, assignment operators – increment and decrement operators. conditional operators. bitwise operators, special operators – Arithmetic Expressions- Evaluation of Expressions   Precedence of Arithmetic Operators - Type Conversions in Expressions - Operator Precedence and Associativity – Mathematical functions.

Unit II

Managing I/O Operations: Reading and Writing a Character – Formatted Input, Output - Decision Making & Branching: if statement - if else statement - nesting of if else statements -

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 Arrays - Declaration, Initialization -- Two-Dimensional Arrays – Multi-dimensional Arrays – Dynamic Arrays - Initialization. Strings: Declaration, Initialization of string variables -- reading and writing strings – string handling functions.

Unit IV

User-defined functions: need – multi-function programs - elements of user defined functions – 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. Structures and Unions: Defining a structure – declaring a structure variable – accessing structure members - initialization – copying and comparing - operation on individual members - array 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, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer increments and scale factors - pointers and character strings - pointers as function arguments – pointers and structures. Files: Defining, opening, closing a file – IO Operations on files – Error handling during IO operations – command line arguments.

Text Book

Programming in ANSI C, E.Balagurusamy, 6th Edition, Tata McGraw Hill Publishing Company, 2012.

Unit I: Chapter 1 (Except 1.3-1.7, 1.10-1.12),
      Chapter 2 (Except 2.9, 2.13),
      Chapter 3 (Except 3.13)
Unit II: Chapters 4 – 6
Unit III: Chapter 7,
      Chapter 8 (Except 8.5, 8.6, 8.7, 8.9, 8.10)
Unit IV: Chapter 9 (Except 9.20),
      Chapter 10
Unit V: Chapter 11 (Except 11.8, 11.10, 11.12, 11.14, 11.15, 11.17),
      Chapter 12 (Except 12.6)

Reference Books

1. Programming with C, Schaum's Outline Series, Gottfried, Tata McGraw Hill, 2006
2. Programming with ANSI and Turbo C, Ashok N.Kamthane, Pearson Education, 2006
3. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
4. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

CS2: Lab 1: Programming in C
(6 Hours - 4 Credits)

Section A
1. Write a C Program to find the sum of digits
2. Write a C Program to check whether a given number is Armstrong or not
3. Write a C Program to check whether a given number is Prime or not
4. Write a C Program to generate the Fibonacci series
5. Write a C Program to display the given number is Adam number or not
6. Write a C Program to print reverse of the given number and string
7. Write a C Program to find minimum and maximum of 'n' numbers using array
8. Write a C Program to arrange the given number in ascending order
9. Write a C Program to add, subtract and multiply two matrices
10. Write a C Program to calculate NCR and NPR

Section B
1. Write a C Program to find the grade of a student using else if ladder
2. Write a C Program to implement the various string handling function
3. Write a C Program to create an integer file and displaying the even numbers only
4. Write a C Program to calculate quadratic equation using switch-case
5. Write a C Program to implement the various string handling function
6. Write a C Program to generate student mark list using array of structures
7. Write a C Program to create and process the student mark list using file
8. Write a C Program to create and process pay bill using file
9. Write a C Program to create and process inventory control using file
10. Write a C Program to create and process electricity bill using file

AS1: Discrete Mathematics
(4 Hours - 4 Credits)

Unit I

Set Theory: Introduction – Sets - Notation and Description of sets – Subsets – Venn Euler Diagrams – Operation on sets - Properties of set operations – Verification of basic laws and algebra by Venn diagram.

Unit II

Relations and Functions: Relations - Representation of a relation – Operations on relations - equivalence relation – Closures & Warshalls Algorithm - Partial order Relation – Hasse Diagrams – Lattices.

Unit III

Logic: Introduction – IF statements – Connectives - Truth table of a formula – Tautology - Tautological implications and Equivalence of formulae - Quantifiers.

Unit IV

Recurrence relations and Generating functions: Recurrence relation – an introduction - Polynomial and their evaluations – Recurrence relations Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous(linear) relations - Solutions of non-homogeneous relations – Generating functions (For all the theorems consider the statements without proofs).

Unit V

Graph Theory: Basic concepts – Matrix representations of graphs – Trees – Spanning tree shortest path problem.

Text Book

Discrete Mathematics – M. Venkataraman, N. Sridharan and N.Chandrasekaran – The National Publishing Company, May 2009.

Unit I : Chapter 1.1 to 1.8
Unit II: Chapter 2(2.2 to 2.6), 10(10.1)
Unit III: Chapter 9 (9.1 to 9.3, 9.6 to 9.8, 9.15)
Unit IV: Chapter 5 (5.1 to 5.6)
Unit V : Chapter11(11.1 to 11.5)

Reference Book

Applied Discrete Structures for Computer Science – Alan Doerr and Kenneth Levesseur, Galgotia publications, 2000.

SBS1 : Lab2 : Office Automation Lab
(2 Hours – 2 Credits)

MS Word

1. Create a work document consists two pages in a Book named "XX" and then do the following:
   a. Formatting Text, Alignment and Font Style
   b. Perform Find and Replace
   c. Add Header and Footer option to specify name of the Book Chapter Heading and Page number of total pages.
2. Create a word document having details of our College courses using bulleted and number lists. Type the title using Word Art.
3. . Design a Letter to felicitate Farewell Address to our seniors with Font Setting/Page Borders/Word Art/Clip Art/Symbols.
4. Create a News letter Article (using Columns, Drop cap) in MSword.
5. Create a time table for your Internal Exam Schedule (using Table)
6. Type Business letter and send it to more using Mailmerge.
7. Create your own Resume.

MS Excel

1. Create and Excel worksheet consists of Student details and then do the following:
   a. Calculate student wise total and subject wise total.
   b. Find the Maximum and Minimum marks of the subject.
   c. Filter the records to answer the give criteria(Auto Filter/Advanced Filter)
   d. Sort the records.
2. Create an Excel worksheet having Employee details suitably and then do following.
   a. Format the cells.
   b. Use functions to calculate Net Pay and Gross Pay.
   c. Perform conditional formatting and validation.
3. Create a chart for the above exercise 2.
4. Create a macro.

MS Power Point

1. Create a Power point presentation showing your various activities of the department
   ❖ Perform slide translation and Setting background designs
2. Create a Power point presentation showing various aspect of your college and perform custom animation and import sound.
3. Create a presentation using design templates and then perform the following one:
   ❖ Include Table and chart from file.
   ❖ Include Picture and run the presentation using auto play.
4. Perform Hyper link within slides and link other documents.

MS Access

1. Crate a Student Database having Name, Regno, Tamil, English, Maths, Total, and Average
   ❖ Perform to find total and average and check data entered.
2. Create an Inventory database having Item Name, Item no. Quantity and Price.
   ❖ Perform query operation to retrieve data.
3. Create a form to enter the details of Book database.
4. Create report for the above database.

NME1: Office Automation
(2 Hours – 2 Credits)

Unit I

Introduction to Microsoft Office 2010 What's new in Microsoft Office Word 2010- Opening Screen of Microsoft Word Screen -Working with Document in Microsoft Word 2010 - Introduction – saving the file - Formatting - Editing the document - Uusing mail merge in word 2010.

Unit II

Working with Longer Documents in Word 2010 - Working with tables and Charts in ard 2010.

Unit III

Introduction to Microsoft Excel 2010 - Spreadsheets basics -Creating a Worksheet in Microsoft Excel 2010 - Copying formula – Styles –Functions in Excel.

Unit IV

Creating Charts in Excel 2010 -- Web Based commands of Excel 2010 – Learn about Data connections.

Unit V

Introduction to Microsoft PowerPoint 2010 – Creating presentation - adding graphics Packing presentations to Go.

Text Book

Microsoft Office 2010 The Ultimate Guide   LP Editorial Board, Law Point Publications, 2011.

Reference Books

1. Learning computer fundamentals, MS Office and Internet & Web technology, Dinesh Maidasani, FIREWALL MEDIA, Third Edition, 2014

2. A Beginners Guide to Computers - Alexis Leon & Mathews Leon-Vikas Publishing House Pvt. Ltd., 2001.

3. Fundamentals of Computers, P. Mohan, Himalaya Publishing House. Revised Edition, 2010.

4. Fundamentals of Computers, V. Rajaraman. PHI Publication, Fifth Edition, 2010.

II Semester
CS3: Object Oriented Programming with C++
(4 Hours - 4 credits)

Unit I

Software Crisis – Software Evolution – Basic Concepts of Object-Oriented Programming Benefits of OOP – Object-Oriented Languages - Applications of OOP – Application of C— - Structure of a C++ Program Tokens Keywords Identifiers – Basic Data Types – User-defined Data types – Derived data types -- Symbolic constants - Type compatibility Declaration of variables - Dynamic initialization of variables –Reference variables – Operators

in C++ - Manipulators – Type cast operator – Expressions and their types-Implicit conversions – Control structures – The main function · Function prototyping – inline functions – Function overloading.

Unit II

Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Array within a class   Memory allocation for objects – Static data members   Static member functions – Array of objects - Objects as function arguments – Friendly functions · Returning objects – Constant member functions – Constructors – Parameterized constructor – Multiple constructors in a class – Constructors with default arguments ·· Dynamic initialization of objects – Copy constructor – Destructors.

Unit III

Defining operator overloading – Overloading unary operators – Overloading binary operators – Overloading binary operators using friend function – Rules for overloading operators - Defining derived classes – Single inheritance ·· Making a private member inheritable · Multilevel inheritance   Multiple inheritance – Hierarchical inheritance – Hybrid inheritance - Virtual base classes – Constructors in derived class – Member classes: Nesting of classes.

Unit IV

Pointer to objects – this pointer – Pointers to derived classes – Virtual functions – Pure virtual functions – C++ Stream classes - Unformatted I/O operations · Managing output with manipulators.

Unit V

Classes of file stream operations – Opening and Closing files · Detecting end of file – More about open() function – File modes, File pointers and their manipulation   Sequential input and output operations · Command-line arguments- Templates: class templates and function templates.

Text Book

Object Oriented Programming with C++, E. Balagurusamy, McGraw Hill Education (India) Private Limited, New Delhi, *Sixth Edition*-2013.

    Unit 1 :   Chapter 1 (Except 1.3, 1.4).
              Chapter 2 (Only 2.6).
              Chapter 3 (Except 3.20, 3.21, 3.22).
              Chapter 4
    Unit II : Chapter 5 (Except 5.18, 5.19).
              Chapter 6 (Except 6.8, 6.9, 6.10)

Unit III : Chapter 7
Chapter 8
Unit IV : Chapter 9,
Chapter 10
Unit V : Chapter 11 (Except 11.8).
Chapter 12 (Only 12.2, 12.3 and 12.4)

Reference Books

1. C++ - The Complete Reference, Herbert Schildt, TMH, 1998.
2. C++ How to Program, Paul Deitel, Harvey Deitel, PHI, Ninth edition (2014).
3. Ashok N.Kamthane, Object Oriented Programming with ANSI & Turbo C ++, Pearson Education, 2006.
4. Object-Oriented Programming With C++, Poornachandra Sarang, 2nd Edition, PHI Learning Private Limited, New Delhi, 2009.
5. Object-Oriented Programming Using C++, Alok Kumar Jagadev, Amiya Kumar Rath and SatchidanandaDehuri, Prentice-Hall of India Private Limited, New Delhi, 2007.

CS4: Lab 4: Object Oriented Programming with C++ Lab
(6 Hours - 4 credits)

Section A

1. Printing Prime numbers between two given numbers.
2. Printing 3 digit numbers as a series of words. (Example 543 should be printed out as Five Four Three).
3. Finding area of geometric shapes using function overloading.
4. Inline functions for simple arithmetic operations.
5. Demonstrating the use of Pre-defined Manipulators.
6. Demonstrating the use of friend function.
7. Creating student mark list using array of objects.
8. Demonstrating constructor overloading.
9. Overloading the unary – operator.
10. Demonstrating single inheritance.
11. Demonstrating the use of "this" pointer.
12. Designing our own manipulator.
13. Illustrating function templates.
14. Illustrating class templates.

Section B

1. Overloading the binary – operator.
2. Demonstrating Multiple inheritance.
3. Demonstrating Multilevel inheritance.
4. Demonstrating Hierarchical inheritance.
5. Demonstrating Virtual functions.
6. Processing mark list using binary file.
7. Count number of objects in a file.
8. Demonstrating the use of Command-line arguments.

AS3: Resource Management Techniques
(4 Hours - 5 Credits)

Unit I
Development of OR: Definition of OR – Modeling - Characteristics and 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 - Big-M method - Concept of duality in LPP - Definition of primal dual problems - General rules for converting any primal into its dual.

Unit IV
Duality Theorems: (without proof) Primal dual correspondence - Duality and Simplex method - Mathematical formulation of assignment problem - Method for solving assignment problem.

Unit V
Mathematical formulation of Transportation Problem: Methods for finding IBFS for the Transportation Problems.

Text Book

Operations Research, S.D.Sharma, Kedar Nath Ram Nath & Co.

Unit I: Chapter-1(1.1, 1.2, 1.4,1.,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 (5.1,5.2,5.2.1,5.3,5.4.5.5.4)
          Chapter- 7 (7.1,7.2,7.3,7.4)
Unit IV: Chapter-7 (7.5) (Statements only); 7.6, 7.7
          Chapter 11(11.2,11.3,11.4)
Unit V: Chapter-12 (12.2 to 12.8)

Reference Books
1. Operation Research, Nita H.Shah, Ravi M.Gor and Hardik soni,Prentice-Hall of India Pvt. Ltd., New Delhi 2008.
2. Operation Research, R.Sivarethinamohan, Tata McGraw Hill, 2005.

NME 2: Introduction to HTML
(2 Hours – 2 Credits)

Unit I

World Wide Web: Introduction the web defined – web browser details – web writing styles – web presentation outline, design ,and management – registering web pages. Searching the World Wide Web: introduction – directories, search engines and meta search engines – search fundamentals – search strategies – how does a search engine works. Telnet and FTP : introduction – telnet and remote login – File transfer – Computer Viruses.

Unit II

HTML Basics: Understanding HTML – Setting Up the Document Structure – Formatting Text by Using Tags – Using Lists and Backgrounds – Creating Hyperlinks and Anchors Style Sheets and Graphics: Introduction to Style sheets.

Unit III

Graphics: Selecting a Graphics Format – Preparing Graphics for Web Use – Inserting Graphics – Arranging Elements on the Page – Controlling Image Size and Padding.

Unit IV

Hyper linking from Graphics – Utilizing Thumbnail Graphics – Including Alternate Text for Graphics- Navigation: Creating Navigational Aids – Creating Tables – Formatting Tables.

Unit V

Layouts: Creating Division-Based Layouts – Creating User Forms – Using Frames for Layout – Incorporating Audio and Video.

Text Book

Microsoft Step by Step - HTML and XH, Faithe Wempen, Prentice Hall of India Private Limited, New Delhi, 2006.

Reference Books

1. C.Xavier . — World Wide Web Design with HTML‖ , TMH 2007
2. First lessons in HTML 5 – LP Editorial Board, Law point publications, 2012.
3. Internet and Web design, Ramesh Bangia, Firewall Media, (An imprint of Lakshmi Publications Pvt. Ltd.), Second Edition 2006

III Semester
CSS: Java Programming
(4 Hours 4 Credits)

Unit I

Introduction : Features of Java Language – Types of Programs – Java Architecture – Literals – Data types – Variables – Structure of Java Program – Comments – Expression and Statements – Type Conversion – Arithmetic Operators – Bitwise Operators – Relational Operators – Logical Operator – Ternary Operator – Operator Precedence.

Unit II

Control Structure and Arrays: If...else Statement – Switch Statement – while Statement – do...while Statement – for Statement - Break in Loop – One Dimensional Array – Multi Dimensional Array.

Unit III

Class and Interface: Definition – new operator and objects – dot operator – Method declaration and Calling – Constructors – Instance Variable – this in Constructor – Method Overloading – Passing Objects as Parameters – Sub Class – Method Overriding – Final Class – Method - Variable – Object destruction – Static Class – Method – Variable – Abstract Class – Package – Import Statement – Access modifier – Interfaces.

Unit IV

String, Wrapper & Exception classes: Number Class – Character Class - Boolean Class – String Class – String Buffer Class – Types Of Exception – Catching Exception – Throwing Exception – User Exception – Finally Block - Checked and Unchecked Exceptions.

Unit V

I/O and Multithreading: I/O Streams – File Class – Byte Stream – Disk File Handling – Memory Handling – Filtered Byte Stream – Random access File – Character Stream – Multithreading – Creations – Thread States – Multithreaded Programming - Thread Priorities – Waiting For Thread – Join Method – Controlling Threads.

Text Book

Programming in Java2, By Dr.K.Somasundaram . Publisher : First Edition JAICO Publishing House,2008.

Unit I: Chapters 1.2 To 1.4, 2.1 To 2.3, 3.1 To 3.4, 4.1 To 4.6
Unit II: Chapters 5.1 To 5.7, 6.1, 6.2
Unit III: Chapters 7.1 To 7.9,8.1 To 8.9,9.1 To 9.4
Unit IV: Chapters 10.1 To 10.7, 12.1 To 12.4, 12.6, 12.7, 14.1, 14.2
Unit V: Chapters 13.1 To 13.6, 13.10, 13.11, 15.1 To 15.7

Reference Books
1. Programming with java, E.Balaguruswamy TMH, 4th Edition
2. Java 2: The Complete Reference , Herbert Schildt , 5th Edition, 2002 , McGraw Hill Education (India) Private Ltd .
3. Programming with Java a Santa, A Complete Series , John R.Hubbard , 2nd Edition(2004), Pearson NCI International.

CS6: Lab 5: Java Programming
(4 Hours -- 3 Credits)

Section: A

Write Programs in Java for the following:
1. To implement a simple temperature conversion program.
2. To perform addition and subtraction of complex numbers using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. String manipulation using String Methods (Use of any five String methods are preferred).
6. Write a program to fill names into a list .Also, copy them in reverse order into another list. If the name contains any numeric value throw an exception "Invalid Name"
7. Program to demonstrate the use of any two built-in exceptions in Java.

Section: B

1. To perform multiplication of matrices using class and objects.
2. Using multilevel inheritance process student marks.
3. Implement multiple inheritance for payroll processing.
4. Implement interface for area calculation for different shapes.
5. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operators. Also write a program to use the package.
6. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
7. Define an exception called ": **Marks Out of bound:**" Exception. that is thrown if the entered marks are greater than 100.
8. Program to demonstrate the use of Wrapper class methods.
9. File Processing using Byte stream.
10. File Processing using Character Stream.
11. Write applets to draw the following Shapes:
    (a). Cone (b). Cylinder (c). Square inside a Circle (d). Circle inside a Square
12. Write an applet Program to design a simple calculator.
13. Write an Applet Program to animate a ball across the Screen.

CS7 : Digital Principles and Computer Organization
(4 Hours - 4 Credits)

Unit I

Number Systems and Codes: Binary Number system – Binary to decimal –decimal to binary - hexa decimal – ASCII code – Excess-3 Code – Gray code.
Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.

Unit II

Combinatorial Logic Circuits: Boolean Laws and Theorems. - Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions- Product-of sums method –Product-of sums Simplifications.

Data Processing Circuits: Multiplexers – Demultiplexers-1-of-16 Decoder – BDC-to-decimal Decoders – Seven-segment Decoders - Encoders – Exclusive-OR Gates- Parity Generators and Checkers.

Unit III

Arithmetic Circuits: Binary Addition- Binary Subtraction – 2'S Complement Representation - 2'S Complement Arithmetic - Arithmetic Building Blocks.

Unit IV

Basic Computer organization and Design: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions - Timing and control - *Instruction cycle:* Fetch and Decode - Register reference instructions.

Micro programmed Control: Control memory organization - Address sequencing, micro instruction format and symbolic microinstructions - symbolic micro-program - binary micro-program.

Unit V

Central Processing Unit : General register organization - stack organization - instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC - Parallel processing - Pipeline- general co.

Input-output organization: Peripheral devices - I/O interface - *Memory organization.* Memory hierarchy - Main memory - Auxiliary memory.

Text Book

1. Digital Principles and Applications – Donald P Leach. Albert Paul Malvino. Goutam Saha, 8th edition , McGraw-Hill Education, 3rd reprint 2015.
2. Computer System Architecture. M. Morris Mano, Pearson Education. 3rd edition, 2007

Unit I:	5: (5.1 to 5.9) and 2: (2.1 to 2 3)	Text Book 1
Unit II:	3: (3.1 to 3.8) and 4: (4.1 to 4.7)	Text Book 1
Unit III:	6: (6.1 to 6.8)	Text Book 1
Unit IV:	5 (5.1 to 5 5) and 7 (7.1 to 7.3)	Text Book 2
Unit V:	8 (8.1 to 8.5), 9 (9.1 to 9.2), 11 (11.1 to 11.5) and 12.(12.1 to 12.3)	Text Book 2

Reference Books:
1. Digital design, R.Anantha Natarajan, PHI Learning, 2015.
2. Principles of digital Electronics, K.Meena, PHI Learning, 2013.
3. Digital Computer Fundamentals, Thomas C. Bartee TMH 2007.
4. Digital Circuits and Design, S. Salivahanan and S. Arivazhagan, Vikas Publishers, 2005.
5. Computer Organization and Architecture, V.Rajaraman and T.Radhakrishnan, PHI learning, 5th Print, 2015.
6. Computer Organization, Carl Hamacher Zvonko Vranesic Safwat Zaky, McGraw Hill Education, 5th Edition, 11th reprint, 2015.
7. Computer Organization and Architecture, Smruti Ranjan Sarangi, McGraw Hill Education.

AS3: Computer Based Financial Accounting
(4 Hours – 4 Credits)

Unit I

Financial Accounting: Meaning, Nature and scope, Limitations **Accounting Principles** : Basic Concepts and Conventions Objectives of accounting - Accounting rules.

Unit II

Books and records : Recording of business transactions – Types of accounts – Journal – Ledger – Journal Vs Ledger, Subsidiary books -- Trial balance.

Unit III

Final Accounts: Introduction – Trading account – Profit and loss account – Balance sheet. (Simple problems)

Unit IV

Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut Company – Ledger Creation: Creating, Displaying, Altering and Deleting. F11 – Features and F12 – Configuration.

Unit V

Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase, Memo, Display, Alter, Delete, Insert, Statement of Reports: Trail balance, Profit and Loss account, Balance sheet.

Text Books

1. Financial Accounts – R.S.N. Pillai and Bagavathi, S.Chand, 2007.
   Unit I: Pg. Numbers   1 to 22
   Unit II : Pg. Numbers – 30 – 65
   Unit III: Pg. Numbers – 154 to 170
2. Tally (version 9) – C.Nellai Kannan. 2007
   Unit IV : Pg. Numbers – 5 to 61
   Unit V : Pg. Numbers – 62 to 102

Reference Books

1. Comdex Tally 9   Dr. Namrata Agrawal, Dream Tech Publications.
2. Tally (Accounting Software) S.Palanivel. Margham Publications, 2010.

SBS3: Lab 6 : Business Accounting
(2 Hours – 2 Credits)

I.   Company Creation
II.   Ledger Creation
III.   Voucher Creation
        a) Contra voucher
        b) Payment voucher
        c) Receipt voucher
        d) Journal voucher
        e) Purchase voucher
        f) Sales counter
IV.   Reports
        a) Day book
        b) Trail balance
        c) Final Accounts
        d) Purchase Register
        e) Sales Register
        f) Outstanding Receivable
        g) Outstanding Payable
        h) Cheque Printing
        i) Bank Reconciliation Statement

IV Semester
CS8: Data Structures and Computer Algorithms
(4 Hours - 4 credits)

Unit I

    Introduction to data structure: The need for data Structure-Definitions-Data Structures-Arrays: Introduction, range of an array-one dimensional array-two dimensional array-special types of matrices-linked lists: Introduction - benefits and limitations of linked list-Types-singly linked lists-circular linked lists-doubly linked lists.

Unit II

    Stack: Introduction- ADT stack - implementation of stack- application of stack. **Queue:** Introduction - implementation of basic operations on array based and linked list based queue - circular Queues.

Unit III

    Trees: Introduction - Binary Trees-representation of binary trees-Binary tree Traversals- Recursive procedures of traversal methods-Expression Trees-Threaded Trees-Application of Trees.

Unit IV

    Algorithms: Introduction: What is an Algorithm? - Algorithm Specification - Performance Analysis - Divide and Conquer: General method – Binary Search – Finding the maximum and minimum – Merge Sort – Quick Sort - Selection –Strassen's Matrix Multiplication.

Unit V

    The Greedy Method: General Method – Knapsack problem - Job Sequencing with deadlines – **Minimum cost spanning trees:** Prim's Algorithm - Kruskal Algorithm - Optimal Storage on tapes – Optimal merge patterns - single source shortest path.

Text Books

1. Data Structures, A. Chitra, P. T. Rajan, Vijay Nicol Imprints Pvt Ltd, Mc Grawhill Education of India Pvt Ltd., 2006.

   > Unit I :Chapter 1, 3 (Except Multi-dimensional Arrays) and 4 (Except Simple Algorithms on linked lists, Circular doubly linked lists, multiple linked lists applications, polynomial representation, polynomial addition, representation of polynomials)
   > Unit II : Chapters 5, 6 (Except Tower of Hanoi, Dequeue)
   > Unit III : Chapters (Except Priority Queues)

2. Fundamentals of Computer Algorithms, Ellis Horrowitz, Sarataj Sahni, Galgotia Publications Pvt Ltd, New Delhi

   > Unit IV : Chapter 1 (Except 1.4) Chapter 3 (Except 3.2, 3.9)
   > Unit V : Chapter 4 (Except 4.2, - 5.3)

Reference Books

1. Data Structure and Algorithm Analysis in C – Mark Allen Weiss – Second edition, Addison Wesley publishing company, 1997

2. C and C++ Programming concepts and Data Structures, P.S.Subramanyam, BS Publications, 2013.

3. Data Structures and Algorithms, Alfred V.Aho, John E.Hopcraft and Jeffrey - Ullman, Pearson Education, Fourteenth Impression, 2013.

CS9: Lab 7: Data Structures and Computer Algorithms
(4 Hours -- 4 credits)

Recommended Book:
1. C and C-- Programming concepts and Data Structures. P.S.Subramanyam, BS Publications, 2013.

Section A

(Programs from Data Structures)
(Using C)

1. Implementing Stack as an array.
2. Implementing Stack as a linked list.
3. Convert Infix expression to Postfix expression using stack.
4. Convert Infix expression to Prefix expression using Stack.
5. Implementing Queue as an Array.
6. Implement Queue as a linked list.
7. Binary tree traversals.
8. Implement Binary Search Tree.

Section B

(Programs from Computer Algorithms)
(Using C++)

1. Linear Search
2. Binary Search
3. Bubble Sort Algorithm.
4. Insertion Sort Algorithm.
5. Merge Sort Algorithm.
6. Quick Sort Algorithm.
7. Selection Sort Algorithm.

CS10: Computer Graphics
(4 Hours -- 4 Credits)

Unit 1
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 and M. Pauline Baker, Prentice Hall Of India Pvt. Ltd., New Delhi, Second Edition, 1994.

Unit I	: Chapters 1.1 – 1.8, 2 1–2.3, 2.5, 2.6
Unit II	: Chapter 3.1, 3.2, 3.5-3.7, 3.11
Unit III	: Chapter 4.1 – 4.8
Unit IV	: Chapter 5.1 - 5.5
Unit V	: Chapter 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.

AS4: Principles of Costing
(4 Hours – 4 Credits)

Unit I

Cost : Costing – Cost Accounting – Meaning, Objectives – Advantages – Limitations - Classification of cost – Elements of cost - Difference between Financial accounting vs. Cost accounting.

Unit II

Cost Sheet: Preparation of Cost Sheet – Prime cost – Works cost – Cost of Production – Cost of Sales.

Unit III

Material cost : EOQ - Determination of various stock levels – Methods of pricing material issues (FIFO, LIFO, Simple average and Weighted average)

Unit IV

Labour cost : Meaning – Methods of Remuneration – Time Rate System – Piece Rate System – Differential Piece rate system(Taylor and Merrick) – Incentive and Bonus Plan – Halsey Plan - Halsey Weir Plan - Rowan Plan.

Unit V

Marginal Costing: Meaning – Features – Advantages – Disadvantages   Break Even analysis – P/V ratio – margin of safety (Simple problems only)

Text Book

Cost Accounting – R.S.N. Pillai V.Bagavathi. S.Chand & Company Ltd.(Reprinted on 2013).

Unit I:	Pg. Nos. 1 to 28
Unit II:	Pg. Nos. 29 to 53
Unit III:	Pg. Nos. 80 to 135
Unit IV:	Pg. Nos. 163 to 202
Unit V :	Pg. Nos. 570 to 646

Reference Book

Cost Accounting – L.P. Ramalingam, Dharani Publications.

SBS4 : Lab 8: Multimedia
(2 Hours – 2 Credits)

1. Draw an appealing free-hand image of your choice using the available drawing tools
2. Perform different Transformations like rotation, skewing, flipping, and scaling on object of your choice.
3. Design a certificate of your choice (Ex. Merit certificate, Sports Certificate etc.).
4. Design a flash movie which incorporates the use of the following symbols
   a). Graphic symbol b). Button symbol c). Movie clip symbol
5. Design a commercial advertisement banner of your choice and test it in the Web Browser.

6. Create a movie which includes the following text effects.
   a). Scrolling text b). Dangling text c). Glowing text d). Fading text.
7. Create a movie which includes frame-by-frame animation of an object (or) an image of your choice.
8. Create a movie which includes an object animation using Motion tweening. (Ex. A ball bouncing across the screen along the specified path). Also add appropriate sound effects.
9. Create an appealing animation movie of your choice using Shape tweening . Also add appropriate sound effects.
10. Create an appealing animation movie of your choice combining both Motion tweening and Shape tweening. Also add appropriate sound effects.
11. Create an interactive Slide Show movie about the details of your college. Include **"PREVIOUS", "NEXT"** and **"HOME"** buttons to achieve interactivity.

V Semester
CS11: Relational Database Management Systems
(5 Hours- 4 Credits)

Unit I

Overview of database systems: Managing Data – A Historical Perspective – File Systems Versus a DBMS – Advantages of a DBMS – Describing and Storing Data in a DBMS – Queries in a DBMS – Transaction Management – Structure of a DBMS – People Who Work with Databases.

Introduction to database design: Database Design and ER Diagrams – Entities, Attributes, and Entity Sets   Relationships and Relationship Sets   Additional Features of ER Model Conceptual Design With the ER Model.

Unit II

The relational model: Introduction to the Relational Model   Integrity Constraints over Relations – Enforcing Integrity Constraints   Querying Relational Data – Logical Database Design: ER to Relational – Introduction to Views – Destroying / Altering Tables and Views.

Relational algebra and calculus: Preliminaries   Relational Algebra: Selection and Projection – Set Operations –Renaming – Joins - Division Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus.

Unit III

SQL queries, constraints, triggers: The Form of a Basic SQL Query – UNION, INTERSECT, and EXCEPT – Nested Queries – Aggregate Operators – Null Values – Complex Integrity Constraints in SQL   Triggers and Active Databases   Designing Active Databases.

Unit IV

Schema refinement and normal forms: Introduction to Schema Refinement – Functional Dependencies – Reasoning about FD's – Normal Forms – Properties of Decompositions – Normalization – Schema Refinement in Database Design – Other Kinds of Dependencies

Unit V

Overview of transaction management: The ACID Properties – Transactions and Schedules – Concurrent Execution of transactions – Lock Based Concurrency Control – Performance of Locking – Transaction Support in SQL – Introduction to Crash Recovery.

Security and authorization: Introduction to Database Security – Access Control – Discretionary Access Control – Mandatory Access Control – Security for Internet Applications – Additional Issues Related to Security.

Text book

Database Management Systems. Raghu Ramakrishnan and Johannes Gehrke, McGraw Hill International Edition, Third Edition. 2003.

Unit I	: Chapters 1.1 – 1.9, 2.1 – 2.5
Unit II	: Chapters 3.1 – 3.7, 4.1 – 4.3
Unit III	: Chapter 5.2 – 5.9
Unit IV	: Chapter 19.1 – 19.8
Unit V	: Chapters 16.1 – 16.7, 21.1 – 21.6

Reference Books

1. Database Management Systems - Alexis Leon and Mathews Leon. Vikas Publishing, Chennai. 2002.
2. Database Management Systems - G.K. Gupta, McGraw Hill Education. 4th reprint 2015. Pearson Education Asia, 2001
3. Database System Concepts – Abraham Silberschatz. Henry F.Korth, S.Sudarshan, 6th Edition, McGraw Hill. 2010.
4. Database Management Systems – R.Panneerselvam, 2nd Edition. PHI Learning, 2015.
5. Database Systems Models. Languages. Design and application Programming - R.Elmasri and S.B.Navathe, 6th Edition, Pearson Education, 2013.
6. Teach yourself SQL in 21 days - Ryan K.Stephens. Ronald Plew Bryan Morgan and Jeff Perkins. 2nd Edition, SAMS Publishing.

CS12 :Data Communication and Computer Networks

Unit I

Introduction: A Brief History – Applications – Computer Networks – Categories of Networks – Standards and Standards Organizations – Network Architecture · Open Systems and OSI Model · TCP/IP Architecture. **Communication Media and Data Transmission**: Fourier Analysis – Analog and Digital Data Transmission · Modulation and Demodulation · Transmission Media – Wireless Communications – Data Transmission Basics - Transmission Mode – Interfacing · Multiplexing. **Error Detection and Correction**: Types of Errors · Error Detection – Error Correction.

Data Link Control and Protocol Concepts: Flow Control · Error Control – Asynchronous Protocols · Synchronous Protocols – High-Level Data Link Control (HDLC).

Unit II

Local Area Networks: Types of Networks and Topology –LAN Transmission Equipment · LAN Installation and Performance.

Ethernet: IEEE Standard 802.3 **Token Bus**: IEEE Standard 802.4 **Token Ring**: IEEE Standard 802.5 · Fiber Distributed Data Interface (FDDI) – **Distributed Queue Dual Bus (DQDB)**: IEEE Standard 802.6 – LAN Operating Systems and Protocols – Ethernet Technologies

Wide Area Networks: WAN Transmission Methods - WAN Carrier Types – WAN Transmission Equipments · WAN Design and Multicast Considerations · WAN Protocols.

Unit III

Integrated Services and Routing Protocols: Integrating Services – ISDN Services ISDN Topology – ISDN Protocols – Broadband ISDN – Asynchronous Transfer Mode (ATM) – Principal Characteristics of ATM – Frame Relay · Comparison of ISDN, ATM and Frame Relay.

Wireless LANS: WLAN Applications – Wireless LAN Requirements · Planning for Wireless LANs – Wireless LAN Architecture – IEEE 802.11 Protocol Layer – IEEE 802.11 Physical Layer – Designing the Wireless LAN Layout – WAP Services.

Unit IV

Internet Working: Principles of Internet Working · Routing Principles - Internetwork Protocols (IP) – Shortcomings of IPv4 · IP Next Generation.

TCP Reliable Transport Service: Transport Protocols – The Service TCP Provides to Applications · End –to-End Service and Datagrams – Transmission Control Protocol – User Datagram Protocol.

Unit V

Network Applications: Client-Server Model – Domain Name System (DNS) – Telnet – File Transfer and Remote File access – Electronic Mail – World Wide Web (WWW)

Network Management: Goal of Network Management – Network Management Standards – Network Management Model – Infrastructure for Network Management – Simple Network Management Protocol (SNMP).

Text Book

Data Communications and Computer Networks, Brijendra Singh ,Second Edition, PHI, 2006.

Unit I: Chapter - 1,2,3,5
Unit II: Chapter - 6, 7
Unit III: Chapter - 8, 9
Unit IV: Chapter - 10, 11
Unit V: Chapter – 12

Reference Books

1. Computer Networks, Andrew S Tanenbaum, 4th Ed. Prentice Hall of India, 2006.
2. Data Communications and Computer Networks , Prakash C. Gupta, Prentice Hall of India, 2005.
3. Data and Computer Communications, William Stallings. PHI, 2007.
4. Data Communication and Networking ,Behrouz A. Forouzan, TMH, 2005.
5. Data Communications and Networks , Achyut S Godbole, Tata McGraw Hill, 2005

CS13: Operating System
(5 Hours- 4 Credits)

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 Multiprogramming, 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, File Allocation, Free Space Management, File Access control.

Text Book

Operating Systems, Deitel & Deitel Choffnes, Pearson education, Third edition, 2008.

Reference Books

1. An introduction to Operating systems concepts and Practice, Pramod Chandra P. Bhatt, PHI, Second Edition, 2008.

2. Operating System Concepts, Abraham. Silberschatz Peter Galvan Greg Gagne, 6th edition Windows XP Update, Wiley India edition, 2007.

3. Operating Systems Principles and Design, Pal Choudhury. PHI Learning, 2011.

4. Operating Systems. A Concept Based Approach Dhananjay M.Dhamdhere Tata Mc Graw Hill, 3rd Edition, 2013.

CS14: Lab 9: Relational Database Management Systems
(6 Hours- 4 Credits)

The following concepts must be introduced to the students:

DDL Commands
• Create table, alter table, drop table

DML Commands
• Select, update, delete and insert statements
• Condition specification using Boolean and comparison operators (and, or, not, ,<>,>,<,>=,<=)
• Arithmetic operators and aggregate functions (Count, Sum, Avg, Min, Max)
• Multiple table queries (join on different and same tables)
• Nested select statements
• Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
• Categorization using group by........having
• Arranging using order by

I. Create a table Student-master with the following fields client_no,name, address, city, state, pincode, remarks, bal_due with suitable data types.
     a. Create another table supplier table from client_master. Select all the fields and rename client_no with supplier_no and name with supplier_name.
     b. Insert data into client_master
     c. Insert data into supplier_master from client_master.
     d. Delete the selected row in the client_master.

II. Create a table sales_order with s_order_no and product_no as primary key. Set other fields to store client number, delivery address, delivery date, order status.
     a. Add a new column for storing salesman number using ALTER Command.
     b. Set the s_order_no as foreign key as column constraints.
     c. Set the s_order_no as foreign key as table constraints.
     d. Enforce the integrity rules using CHECK.

III. Create a table student_master with the following fields name, regno, dept and year with suitable data types. Use Select command to do the following.
     a. Select the student's name column.
     b. Eliminate the duplicate entry in table.
     c. Sort the table in alphabetical order.
     d. Select all the Students of a particular department.

IV. Create a table sales_order_details with the s_order_no as primary key and with the following fields: product_no, description, qty_ordered, qty_disp,product_rate, profit_percent, sell_price, supplier_name.

    a. Select each row and compute sell_price*.50 and sell_price*1.50 for each row selected.

    b. Select product_no, profit_percent, Sell_price where profit_per is not between 10 and 20 both inclusive.

    c. Select product_no, description, profit_percent, sell_price where profit_percent is not between 20 and 30.

    d. Select the suppliername and product_no where suppliername has 'r' or 'h' as second character.

V. Create and use the following database schema to answer the given queries

EMPLOYEE

DEFAULT

Field	Type	Null	Key
Eno	Char(3)	No	Primary
Ename	Varchar(50)	No	
Job_type	Varchar(50)	No	
Manager	Char(3)	Yes	Foreign
Hiredate	Date	No	
Dno	Integer	Yes	Foreign
Commission	Decimal(10,2)	Yes	
Salary	Decimal(7,2)	No	

DEPARTMENT

DEFAULT

Field	Type	Null	Key
Dno	Integer	No	Primary
Dname	Varchar(50)	Yes	

Perform the following queries:

    a. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.

    b. Query to display unique Jobs from the Employee Table.

    c. Query to display the Employee Name concatenated by a Job separated by a comma.

    d. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.

e. Query to display the Employee Name and Salary of all the employees earning more than $2850.

f. Query to display Employee Name and Department Number for the Employee No.- 7900.

g. Query to display Employee Name and Salary for all employees whose salary is not in the range of $1500 and $2850.

h. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.

i. Query to display Name and Hire Date of every Employee who was hired in 1981.

j. Query to display Name and Job of all employees who don't have a current Manager.

k. Query to display the Name, Salary and Commission for all the employees who earn commission.

l. Sort the data in descending order of Salary and Commission.

m. Query to display Name of all the employees where the third letter of their name is _A'.

n. Query to display Name of all employees either have two _R's or have two _A's in their name and are either in Dept No 30 or their Manger's Employee No = 7788.

o. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.

p. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.

q. Query to display Name and calculate the number of months between today and the date each employee was hired.

r. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with _J', 'A' and _M'.

s. Query to display Name, Department Name and Department No for all the employees.

t. Query to display Unique Listing of all Jobs that are in Department # 30.

u. Query to display Name, Job, Department No. And Department Name for all the employees working at the Mumbai location.

v. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. and the salary of any employee who earns a commission.

w. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees

x. Query to display the Employee No. And Name for all employees who earn more than the average salary.

y. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a _T.

VI. Create a table master_book to contain the information of magazine code, magazine name and publisher, Weekly/biweekly/monthly, price. Write PL/SQL block to perform insert, update and delete operations on the above table.

VII. Create a table to contain phone number, user name, address of the phone user. Write a function to search for a address using phone numbers.

VIII. Create a table stock to contain the item-code, item-name, current stock, date of last purchase. Write a stored procedure to seek for an item using item-code and delete it, if the date of last purchase is before 1 year from the current date. If not, update the current stock.

IX. Create a table to store the salary details of the employees in a company. Declare the Cursor to contain employee number, employee name and net salary. Use Cursor to update the employee salaries.

X. Create a table to contain the information about the voters in a particular constituency. Write a proper trigger to update or delete a row in the table.

XI. Create a table to store the details of the alumnus in an institution. Write a PL/SQL block to change address of particular alumni. Write proper exceptions and appropriate error message ..

ESI: 1. Mobile Computing
(5 Hours – 4 Credits)

Unit I
INTRODUCTION : Mobile Computing – Mobile Computing Vs wireless Networking Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

Unit II

MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER: Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of tCP Window – Improvement in TCP Performance.

Unit III

MOBILE TELECOMMUNICATION SYSTEM : Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

Unit IV

MOBILE AD-HOC NETWORKS: Ad-Hoc Basic Concepts - Characteristics – Applications – Design Issues - Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) MANET Vs VANET – Security.

Unit V
MOBILE PLATFORMS AND APPLICATIONS :Mobile Device Operating Systems Special Constrains & Requirements – Commercial Mobile Operating Systems - Software Development Kit: iOS, Android, BlackBerry, Windows Phone – M- Commerce – Structure – Pros & Cons - Mobile Payment System – Security Issues.

Text book:
Fundamentals of Mobile Computing - Prasant Kumar Pattnaik, Rajib Mall, PHI Learning Pvt. Ltd. New Delhi – 2012.

Unit I: Chapters 2.3 – 2.5, 3.1 - 3.6
Unit II :Chapters 4.3 – 4.6 , 5.1,5.3,5.7,5.8
Unit III: Chapters 2.7 - 2.9
Unit IV: Chapters 7.1 - 7.9
Unit V: Chapters 9.2 - 9.4, 11.1 - 11.6

Reference Books:
1. Mobile Communications, Jochen H. Schiler. Second Edition, Pearson Education, New Delhi, 2007.
2. Introduction to Wireless and Mobile systems, Dharma PrakashAgarval, Qing and An

Zeng. Thomson Asia Pvt Ltd, 2005.

3. Principles of Mobile Computing. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, Springer, 2003.

ES1: 2. Web Technology
(5 Hours - 4 Credits)

Unit I
TCP/IP: TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? TCP Packet format - Persistent TCP connections – UDP - Differences between TCP and UDP.

Unit II
DNS E-mail – FTP – TFTP – History of WWW Basics of WWW and Browsing - Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia Remote Login (TELNET).

Unit III
Introduction to Web Technology: Web pages - Tiers – Concept of a Tier - Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins Frames – Forms. Dynamic Web Pages: Need – Magic of Dynamic Web Pages - Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface - ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

Unit IV
Active Web Pages: Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. Middleware and Component-Based E-Commerce Architectures: CORBA – Java Remote Method Invocation – DCOM. EDI: Overview Origins of EDI – Understanding of EDI – Data Exchange Standards - EDI Architecture – Significance of EDI - Financial EDI - EDI and internet.

Unit V
XML: SGML – Basics of XML – XML Parsers – Need for a standard. WAP: Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.

Text Book
WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures – Achyut S Godbole & Atul Kahate. TMH. 2007.

Unit I: Chapters 3.1-3.5,4.1-4.12
Unit II: Chapters 5.1-5.4,6.1-6.7
Unit III: Chapters 8.1-8.3,9.1-9.13
Unit IV: Chapters 10.1-10.7,15.1-15.3,16.1-16.8
Unit V: Chapters 17.1-17.4,18.1-18.6)

Reference Books

1. INTERNET AND WEB TECHNOLOGIES – Rajkamal, TMH.
2. TCP/IP PROTOCOL SUITE – Behrouz A. Forouzan, 3rd edition, TMH.

ES1: 3. Information Security
(5 Hours – 4 Credits)

Unit I

Introduction: History of Information security - What is Security? - CNSS Security Model - Components of an information System - Balancing Information security and Access - Approaches to Information security implementation - The SDLC - The Security SDLC.

Unit II

Security Investigation: Need for Security, Business Needs, Threats, Attacks, Professional, Legal and Ethical Issues in Information security.

Unit III

Managing IT Risk: An overview of Risk Management - Risk Identification Risk Assessment - Risk Control Strategies- Selecting Risk Control Strategy Quantitative Versus Qualitative Risk Control Practices, ling Risk.

Unit IV

How to plan for security: Information security Planning and Governance - Information Security Policy, Standards and Practices - ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture – Continuity strategies.

Unit V

Security Technology: Introduction -- Intrusion detection and prevention systems Scanning and Analysis Tools Biometric access controls - Cipher methods - Cryptographic algorithms – Cryptographic tools – Protocols for secure communication- Attacks on Cryptosystems.

Text book

Principles of Information Security, Michael E Whitman and Herbert J Mattord, Fourth Edition, CENGAGE Learning, 6th Indian Reprint, 2013.

Unit I: Chapter 1
Unit II: Chapter 2, Chapter 3
Unit III: Chapter 4
Unit IV: Chapter 5
Unit V: Chapter 7, Chapter 8

Reference books

1. Handbook of Information Security Management, Micki Krause, Harold F. Tipton, Vol. 1-3, CRC Press LLC, 2004.

2. Hacking Exposed, Stuart Mc Clure, Joel Scrambray, George Kurtz, Tata McGraw-Hill, 2003

3. Computer Security Art and Science, Matt Bishop, Pearson/PHI, 2002.

SBS5: Lab10 : Networking
(2 Hours – 2 Credits)

1. Write a program to Detect Errors using Vertical Redundancy Check (VRC).

2. Write a program to Detect Errors using Longitudinal Redundancy Check (LRC).

3. Write a program to Detect Errors using Cyclic Redundancy Check (CRC).

4. Write a Socket program to implement Asynchronous Communication.

5. Write a Socket program to implement Isochronous Communication.

6. Write a program to implement Stop & Wait Protocol.

7. Write a program to implement Sliding Window Protocol.

8. Write a program to implement the Shortest Path Routing using Dijkstra algorithm.

9. Write a Socket Program to Perform file transfer from Server to the Client.

10. Write a Program to implement Remote Procedure call under Client / Server Environment.

VI SEMESTER
CS15: DOT NET Programming
(5 Hours – 4 Credits)

Unit I

Essential Visual Basic. NET - The Visual Basic Language : Operators , Conditionals , and Loops: In Depth – Immediate Solutions. - The Visual Basic Language : Procedures , Scope , and Exception Handling : In Depth – Immediate Solutions.

Unit II

Windows Forms : In Depth – Immediate Solutions. Windows Forms : Textboxes , Rich Text Boxes , Labels , and Link Labels : In Depth – Immediate Solutions.

Unit III

Windows Forms : Buttons , Checkboxes , Radio Buttons , Panels , and Group Boxes : In Depth – Immediate Solutions. Windows Forms : ListBoxes , Checked List Boxes , Combo Boxes and Picture Boxes : In Depth – Immediate Solutions.

Unit IV

Windows Forms : Scroll Bars , Splitters , Track Bars , Pickers , Notify Icons , Tool Tips, and Timers : In Depth – Immediate Solutions. Windows Forms : Menus , Built-in Dialog Boxes and Printing : In Depth – Immediate Solutions.

Unit V

Windows Forms : Image Lists , Tree and List Views , Toolbars , Status and Progress Bars , and Tab : In Depth – Immediate Solutions. Object Oriented Programming : In Depth – Immediate Solutions. Object Oriented Inheritance : In Depth – Immediate Solutions.

Text Book

Visual Basic.Net Programming Black Book, Steven Holzner , Dream Tech Press. 2010.
        Unit I: Chapters 1, 2, 3
        Unit II: Chapters 4, 5
        Unit III: Chapters 6, 7
        Unit IV: Chapters 8, 9
        Unit V: Chapters 10, 11, 12

Reference Books

1. Visual Basic.Net, C.Muthu , Tata McGrawHill Education , 2008.
2. The Complete Reference Visual Basic.Net, Jeffrey R.Shapiro , Tata McGraw Hill Education ,2002

CS16 :Lab 11 : Dot Net Programming
(6 Hours - 4 Credits)

VB.NET:
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.

CS17: Software Engineering
(5 Hours- 4 Credits)

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 – Languages and Processors for Requirements Specification

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.

Unit V

Verification and Validation Techniques: Quality Assurance - Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification. **Software Maintenance:** Enhancing Maintainability During Development – Managerial Aspects of Software Maintenance – Configuration Management – Source-Code Metrics – Other Maintenance Tools and Techniques.

Text book

Software Engineering Concepts, Richard Fairley, Tata McGrawHill Publishing Company Limited. NewDelhi, 1997.

Unit – I	: Chapters 1.1 – 1.4, 2.1-2.5
Unit – II	: Chapter 3.1 - 3.4
Unit – III	: Chapter 4.1 – 4.3
Unit - IV	: Chapter 5.1 – 5.9
Unit – V	: Chapters 8.1, 8.3 – 8.7, 9.1 – 9.5

Reference books

1. Software Engineering – K.L.James, Prentice Hall of India Pvt. Ltd., New Delhi, 2009.
2. Fundamentals of Software Engineering – Rajib Mall, Prentice Hall of India Pvt. Ltd., New Delhi, 2003.

ES2:1. Data Mining

(5 Hours – 4 Credits)

Unit I

Introduction: Data mining application – data mining techniques – data mining case studies the future of data mining – data mining software. **Association rules mining:** Introduction -Basics-task and a Naive algorithm- Apriori algorithm – improve the efficiency of the Apriori algorithm mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms.

Unit II

Data warehousing: Introduction – Operational data sources- data warehousing – Data Warehousing design – Guidelines for data warehousing implementation - Data warehousing - Metadata **Online analytical processing (OLAP):** Introduction – OLAP characteristics of OLAP system - Multidimensional view and data cube - Data cube implementation – Data Cube operations OLAP implementation guidelines.

Unit III

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Classification: Introduction – decision tree – over fitting and pruning – DT rules – Naïve Bayes method- estimation predictive accuracy of classification methods – other evaluation criteria for classification method – classification software.

Unit IV

Cluster analysis: cluster analysis – types of data – computing distances-types of cluster analysis methods – partitioned methods – hierarchical methods – density based methods – Dealing with large databases – quality and validity of cluster analysis methods – cluster analysis software.

Unit V

Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software. **Search engines:** Search engines functionality- search engines architecture – Ranking of web pages.

Text Books

Introduction to Data mining with case studies, G.K. Gupta. PHI Private limited. New Delhi. 2008.

Unit I : Chapters 1 & 2
Unit II : Chapters 7 & 8
Unit III: Chapter 3
Unit IV: Chapter 4
Unit V : Chapters 5 & 6

Reference Books

1. Data Warehousing. Data Mining & OLAP. Alex Berson and Stephen J. Smith, Tata Mc Graw – Hill Edition, Tenth Reprint 2007.
2. Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Second Edition, Elsevier, 2007.

ES2:2. Compiler Design
(5 Hours   4 Credits)

Unit I

Introduction to Compliers: Compliers and Translator - Need of Translator - The structure of a Compiler – Lexical analysis – Syntax analysis – Intermediate code generation – optimization - code generation -- Complier – writing tools. Finite automata and lexical Analysis: The role of the lexical analysis - A simple approach to the design of lexical analyzers- Regular expression to finite automata – Minimizing the number of states of a DFA.

Unit II

The Syntactic specification of programming languages: context free grammars. derivations and parse trees – capabilities of context free grammars. Basic parsing techniques

Parsers - shift – reduce parsing – operator – precedence parsing - top down parsing predictive parsers.

Unit III

Syntax directed translation: syntax – directed translation schemes – implementation of syntax – directed translators – intermediate code – postfix notation – parse trees and syntax trees – 3 address code – quadruples and triples – translation of assignment statements – Boolean expressions – statements that alter the flow of control. Symbol tables: the contents of a symbol table – data structures for symbol table representing scope information.

Unit IV

Run time storage administration: Implementation of a simple stack allocation scheme - implementation of block-structured languages – storage allocation in block structured languages. Error deduction and recovery: errors – lexical phase errors – syntactic phase errors – semantic errors.

Unit V

Introduction of code optimization: The principle sources of optimization – loop optimization – the DAG representation of basic blocks - value numbers and algebraic laws - Global data flow analysis. Code generation: Object programs – problems in code generation – a machine model - a simple code generator – register allocation and assignment – code generation from DAG's – peepholes optimization.

Text Book

Principles of Complier Design,Alfred V.Aho, Jeffrey D.Ullman , Narosa Publishing House.25th Reprint, 2001.

   Unit I : Chapters 1.1 – 1.11, 3.1 – 3.6
   Unit II: Chapters 4 & 5
   Unit III: Chapters 7.1 – 7.9 , & 9
   Unit IV: Chapters 10(excluding 10.3) & 11
   Unit V: 12 & 15

Reference Book

Compiler Principles, Techniques and Tools by Alfred V.Aho, Monica S.Lam, Ravi Sethi, Jeffrey D. Ullman, Second edition, Pearson Publications, 2007.

ES3: 3. Cryptography & Network Security
(5 Hours – 4 Credits)

Unit I

Security Trends - The OSI security architecture –Security Attacks – Security Services - Security mechanism – A model for network security Symmetric Cipher model – Substitution techniques – transposition techniques - Block cipher principles – The Data Encryption Standard The strength of DES - Block cipher design principles.

Unit II

Evaluation Criteria for AES – The AES Cipher – Multiple Encryption and Triple DES – Block Cipher Modes of Operation – Stream Ciphers and RC4 - Confidentially using symmetric encryption - introduction to number theory – public – key cryptography and RSA.

Unit III

Key management – Diffie Hellman key exchange – message authentication and hash function – hash algorithm – digital signature and authentication protocols – digital signature standard.

Unit IV

Authentication application – Electronic mail Security – IP security – Web security.

Unit V

Intruders –Malicious software – Firewalls.

Text Book

Cryptography and Network Security, Principles and Practices - William Stallings Fourth edition, PHI Education Asia,2006.

Unit I   : Chapters 1.1 to 1.6; 2.1 to 2.3; 3.1 to 3.3& 3.5
Unit II   : Chapters 5,6,7.8,9
Unit III   : Chapters 10.1,10.2; 11, 12
Unit IV   : Chapters 14,15.16,17
Unit V   : Chapter 18.19.20

Reference Books

1. Cryptography and Network Security, Atul kahate - Second edition. TMH.
2. Cryptography and Network Security, Behrouz A.forouzan ,TMH.

SBS 6 : Quantitative Aptitude

(2 Hours – 2 Credits)

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, S.Chand & Company Ltd.. Reprint 2011.

Unit I : Page nos.3-29, 30-45, 46-66.

Unit II : Page nos.117-138,139-160,161-181,182-194

Unit III : Page nos.208-250,251-293,294-310

Unit IV : Page nos. 341-370,384-404

Unit V : Page nos.445-465,466-486, 499-548,549-587

Reference Books:

1. Quantitative Aptitude and reasoning, R.V. Praveen, PHI Learning, 2nd Edition 2013.
2. Magical book on Quicker Maths, M.Tyra, BSC Publishing Co. Pvt.Ltd, Delhi. Reprint, 2011.
3. Quantitative Aptitude for Competitive Exams, Abhijit Guha, 4th Edition, Tata Mc Graw Hill Company, New Delhi.